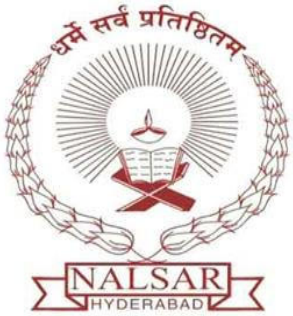

Centre for Aerospace & Defence Laws (CADL)

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Course Material

M.A. (AVIATION LAW AND AIR TRANSPORT MANAGEMENT)

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1.2.7. AIRLINE MANAGEMENT

Compiled by:

Prof. (Dr.) V. Balakista Reddy

Ms. Priya Iyengar

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MODULE I

INTRODUCTION TO AIRLINE MANAGEMENT

INTRODUCTION TO AIRLINE MANAGEMENT

MEANING AND CONCEPT

The world air transport industry has developed to become a major element of the world economy due to its significant multiplier effect. Important factors in the industry's success have been the continuing efforts to ensure a high level of safety, security and technological upgradation to run it as a 'global business' with a system that provides the basic standards and procedures for a smooth air travel. Air Travel being a truly international business, the air transport industry requires common world-wide business practices

Aviation provides the only transportation network across the globe and it is crucial for global business development and tourism enrichment. Air transportation is one of the most important services to offer both significant social and economic benefits. By serving tourism and trade, it contributes to economic growth. It also provides jobs and increases tax revenues. Air transportation is essential for the fast movement of people and cargo shipments around the world. Finally, air transportation improves the quality of people's lives by broadening their leisure and cultural experiences. It gives a broad choice of holiday destinations around the world and is an affordable means to visit distant friends and relatives (ATAG 2005).

The use of commercial aviation has grown significantly over the last few decades, estimated to be more than seventy-fold since the first jet airliner flew in 1949 (ATAG 2005). This rapid growth is attributed to a number of factors. First, rising disposable income and quality of life in many parts of the world have encouraged more people in these areas to travel and explore opportunities overseas. Second, deregulation of aviation laws, and bilateral and open-sky agreements between governments have opened new markets for airlines, which make travel easier and cheaper. Third, demand is increasing because of growing confidence in aviation as a safe mode of travel. Fourth, increased efficiency and increasing competition have reduced world airfares and the cost of travel. Finally, globalization has increased the average distance traveled, as people do business in countries which now have improved political and social environments. The impact of these factors is expected to continue, however, at different levels in different parts of the world. The number of air travelers and the volume of air cargo is expected to continue to grow, increasing the pressure on all the contributors to the air transportation service to take advantage of opportunities and efficiently manage their service.

A major player in the air transportation industry is the airline. Current records indicate that there are more than 900 commercial airlines around the world, with a total fleet of nearly 22,000 aircraft (ICAO 2006). Commercial airlines serve nearly 1,670 airports through a route network of several million kilometers. These airlines transport close to 2 billion passengers annually and 40 percent of interregional exports of goods (by value). Also, an estimated 2.1 million people are employed by airline or handling agents: for example, as flight crew, check-in staff, and maintenance crew (ICAO 2006). Airline services are categorized as being intercontinental, continental, regional, or domestic, and may be operated as scheduled services or charters. In terms of size, airlines vary from those with a single airplane carrying mail or cargo, through full-

service international airlines operating many hundreds of airplanes. In many parts of the world, airlines are government-owned or supported. In recent decades, however, the trend has been to move toward independent, commercial public companies by giving more freedom to non-government ownership of airlines.

The increasing number of commercial airline companies has put more pressure on their management to continually seek profits, reduce cost, and increase revenues. Increasing demand for air transportation service has compelled airline management to take advantage of opportunities in different markets. At the same time, increasing competition among airlines necessitates that airline management seek efficiency in all their decisions to promote their profit. It is no surprise that many airlines throughout aviation history have been unable to remain in business, and in most cases, it is agreed that the demise of these airlines has been attributable to deficient management.

Airline management practice has evolved significantly over the past three decades. The development of this practice has contributed to recent advances in computation and communication technologies and, more importantly, the need to reduce costs and increase revenues. Nowadays airlines seek to perform efficiently in a competitive environment that only provides marginal profits. The airline business is characterized as being one of the most complex, involving multiple conflicting decisions that all need to be optimized at the same time. Several tactics have been developed and used to better plan and operate airlines. These tactics bank on scientific approaches available in operations research and mathematics literature to optimize airlines' decision-making processes, and are usually modeled within computerized systems that can automate decision making. Therefore, these scientifically-based tactics promise an easier decision-making practice for the airlines. The need for these tactics becomes more crucial as the size of the airline increases, and making decisions based on individuals' judgment or experience becomes more difficult. The next section highlights the main challenges of airline management that elaborate the complexity of the airline decision-making process.

CHARACTERISTICS OF AIR TRANSPORTATION INDUSTRY

The history of the air industry has been a saga of continuing adjustment to changing national policy and economic conditions. Since 1960, fluctuating government demands and a variety of international events have teamed up to produce a roller-coaster- like sales curve: up to a peak, down to a valley. Over the years, the industry's operations have become increasingly complex, with each increment of complexity heightening the industry's problems in adapting to change. Today, the industry's unique characteristics make the adaptive process extraordinarily difficult. An understanding of the difficulties is best promoted by an explanation of how the industry has been transformed in the past quarter of a century.

Prior to 1950, the industry was relatively unsophisticated. Its product line was entirely aeronautical—aircraft, engines, propellers, avionic components, and accessories. Long- run production of many airplane types was the order of the day. The labor force, during the post-World War II retrenchment period, was less than one-fifth of the later peak. Three-fourths of the workers were moderately skilled production workers. R & D was an essential prelude to

production, but the subsonic aircraft then being built were less demanding of technological advance, and R & D represented a considerably less significant portion of the total workload than it does today.

The transformation began in the early 1950s with the production of the jet-powered supersonic military airplane, which brought about across-the-board changes in the industry—new types of engines, totally different airframes, different on-board equipment, new tooling and facilities, and, most of all, a vastly greater degree of complexity in products and the methods employed in producing them. New-airplane performance dictated that far greater emphasis be placed on R & D. The combination of R & D and product complexity required a major shift in the composition of the work force to include ever-increasing numbers of scientists, engineers, and highly skilled technicians. All of these changes resulted in increased emphasis on an ever more sophisticated managerial process.

While the industry was adjusting to these changes, it inherited a new responsibility: development and production of guided missiles, particularly long-range ballistic weapons. Then came another major change: the application of turbine power to commercial airliners, whose resemblance to military jets ended with their propulsion systems. The need to transport large numbers of people at high subsonic speeds and multi-mile altitudes involved a further modification of the industry's methods. Finally, in the late 1950s, the industry was assigned still another responsibility: fabrication of equipment to meet the nation's goals in space exploration.

Each of these changes compounded the need for change in the entire industry—more R&D, greater product complexity, more personnel per unit produced, higher skill levels in theworkforce,longerprogramdevelopmenttime,andgreaterneedfornewfacilitieswith only single-program utility because of their specialized natures. Such changes contributed to higher costs of the end products, and the demand in the 1960s and 1970s for still more advanced aerospace systems further escalated both the rate of change and the costs. In defense output, cost—together with the greater capability of the individual system—influenced a trend away from volume production and toward tailored manufacture of fewer types of weapons and fewer numbers of each type.

A half-century of evolution has left the air transport industry with a set of unique characteristics

- Performance demands for new systems require continual advancement of the technological frontier, which in turn involves unusual degrees of uncertainty and risk.
- Because the government is the principal customer, the product line is subject to revisions in program levels occasioned by changing requirements and funding availability.
- Equipment that challenges the state of the art is necessarily costly, the more so because requirements generally dictate short production runs, negating the economies of large-scale production.
- Technologically demanding programs require personnel emphasis in the higher skill levels. Hence, labor input per unit of output is substantially larger than in other manufacturing industries.

- The combination of technological uncertainty and long lead times, often 7–10 years and frequently longer, between program initiation and completion, makes advance estimation of costs particularly difficult.
- Because there are few customers and relatively few programs, competition for the available business is intense.

All of these characteristics contribute to exceptional demand for industry capital, yet profits as a percentage of sales are consistently well below the average for all manufacturing industries.

CHALLENGES OF AIRLINE MANAGEMENT

Impact of Other Players in the Industry

Airline management does not work independently of other players in the air transportation industry. Indeed, the decisions of airline management are very much affected by these other players. Figure 1.1 depicts the different entities that interact with airline management and affect decisions concerning government, airports, customers, alliances, suppliers, unions, and competitors.

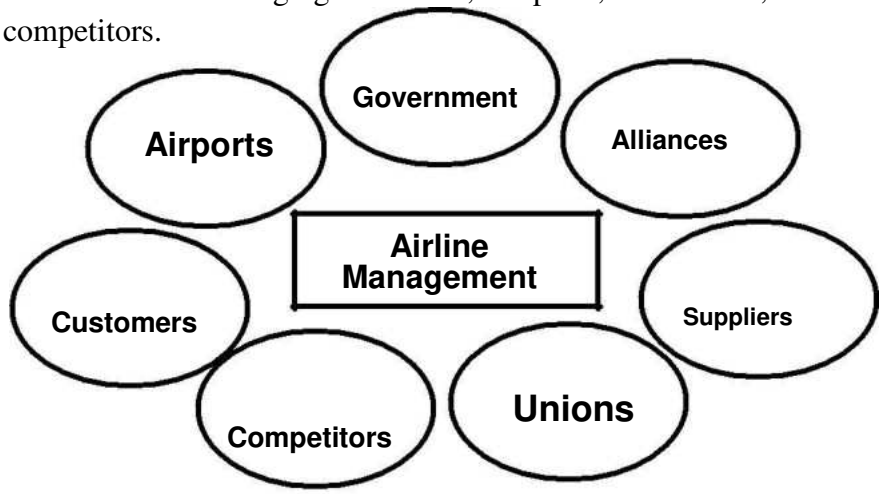


Figure 1.1 The different players in the air transportation industry

First, airline management must comply with the regulations of the airline's home country. It must also take into consideration and comply with the regulations of the governments of the countries where the airlines fly to and from, and whose airspace they cross. Governments typically watch competition between airlines and control airlines' strategic decisions, such as merging, acquisition between carriers, market entry or exit and pricing, environmental regulations, security regulations, maintenance, and safety requirements. Second, airline management should carefully consider the terms of their agreements with the different airports they serve. Several factors affect these agreements, including available infrastructure (gates, runways, baggage handling, and so on), expected traffic, airport charges and incentives, competition from nearby airports, available landing slots, congestion, and operational curfews. Third, an airline should consider the needs and preferences of its potential customers, the

travelers. For instance, the airline should consider schedule convenience, competitive fares, onboard services, punctuality, and efficient customer service. Failing to fulfill the needs and preferences of customers might lead to losing them to other competing carriers or other modes of transportation. Fourth, in many cases, an airline participates in one or more alliances to expand its network coverage or share resources with other airlines. Several forms of alliance are available that reflect the level of cooperation between participating airlines. It is important for an airline to decide which alliance to participate in and how to share its resources efficiently with each member in the alliance to promote profitability. Typically, the airline has to maintain a certain level of operating standards to serve within a worldwide alliance.

Fifth, suppliers are crucial to the continuation of the airline's operation. Airlines depend on suppliers to provide important items such as aircraft, fuel, spare parts, meals, employee uniforms, and so on. Also, in many cases, airlines outsource to vendors some of their jobs and services, such as aircraft maintenance, aircraft cleaning, ground handling, and sales. Therefore, an airline has to keep healthy relationships with its suppliers to continue operating successfully. Another entity in the air transportation industry that an airline has to deal with is unions. Different groups of workers form unions to achieve stronger negotiation power with airline management in terms of salary, benefits, or working rules. Keeping a good relation with labor in order to guarantee smooth operation of the business is one of the main objectives of airline management. Conflicts with unions might typically lead to negative actions by the unions, such as work slowdown or strikes, which usually impair the airline's operation significantly. Finally, in most markets, there is tough competition between several airlines. Typically, airlines continuously monitor the decisions of their competitors that relate to providing capacity, fare levels, fare restrictions, and departure times. In many situations, the decisions of the competing airlines proceed in a leader-follower pattern, where one airline takes an action and the other competing airlines try to find the best way to respond to this action.

Interacting Layers of Decisions

Like many other businesses, airlines management faces three levels of interacting decisions. These levels, as shown in Figure 1.2, include strategic, planning, and operations decisions. Strategic decisions typically require a long lead time before implementation and require a considerable monetary investment. They are also expected to have a significant impact on the form of the airline in the long term. Examples of strategic decisions include growth and expansion, fleet sizing (aircraft orders), hub locations, merging with other airlines, alliance participation, and location of maintenance facilities. Planning decisions are within a few months horizon, and can be defined as the process of efficiently using airline's available resources to maximize its revenue. The resources available to an airline include the facilities and the personnel that operate the business, including, for example, aircraft in different fleets, pilots with different qualifications, flight attendants, maintenance facilities, mechanics, gates, customer service agents, and ramp agents. The planning decisions include forecasting the demand between every origin-destination (OD), flight schedule development, assignment of flights to the different aircraft fleet (if the airline has more than one fleet type), aircraft routing across the different airports' with its maintenance consideration, planning the line of flight for pilots and cabin crew,

crew accommodations, flight-gate assignment, and catering. Other planning decisions include the number of staff required to operate flights at different airports including customer service, ramp agents, baggage handlers, and so on. They also include decisions regarding fare levels in each OD market, fare restrictions, and seat inventory control for each flight. It should be mentioned here that these planning decisions are very dependent on each other, which makes the planning process complex.

The operations decisions for the airlines are those decisions that need to be verified or updated on an hourly or maximally on a daily basis. They include, for

- Strategic
- Planning
- Operations

example, the response to unanticipated incidents such as adverse weather conditions, flights delays and cancellations, aircraft breakdown, and absence of crew or staff due to illness. Operations decisions also include watching revenues, bookings, and anticipated demand levels in the different markets, matching prices with competitors, and managing seat inventory on each flight on a daily basis.

Strategic decisions are expected to impact on planning decisions, which, in turn, affect the operations decisions. In addition, there is a reverse feedback from the operations phase to the planning phase, which also, in turn, may provide feedback to the strategic decisions phase. For example, the observation of a frequent delay of a certain flight waiting for its inbound aircraft might alert schedule planning to alter the schedule of this flight to give enough connection time for its inbound aircraft. Also, strong demand forecasting in markets might call for a change in the strategic plan regarding expansion and increase of fleet size. As explained in the next section, this book covers in detail the tactics currently practiced by airline management for the planning and operations phase. Strategic decisions are considered to be beyond the scope of this book.

Surrounding Events

The air transportation industry is characterized by the effects of rapid and significant impacts from surrounding events and economic and social changes.

The negative impact on air transportation of factors such as wars, civil unrest, terrorist actions, increasing fuel prices, and epidemics has been clearly observed in several areas across the world. These events necessitate that airline management respond quickly and efficiently to study the impact of these events and take actions to alleviate their impact. To survive in business, in many situations, airlines may be forced to cut schedules, reduce fares, lay off employees, and cut salaries and benefits. For example, serious implications on passenger demand, revenue, average fare, and average yield (revenue per seat mile) for airlines in the domesticUS markets were witnessed following the September 11, 2001 (9/11) terrorist attack. It is clear that these four measures were affected significantly because of this event. At that time, most domestic airlines

considered significant actions such as cutting capacity, lowering fares, and discharging employees to respond to these market changes.

Many Groups to Contribute

Another challenge of airline operations is the interaction process among several groups of workers who work together to operate the flights. The product that an airline generates is a passenger seat or a space for cargo. This passenger seat or cargo space is typically a part of a flight that connects between two airports. The number of flights that an airline operates depends on the size of the airline. For large air carriers, the number of flights reaches a few hundred flights a day. Operating each flight requires significant cooperation among several groups of workers who all share the same objective of making the flight ready for departure on time. There are about 12 different groups who work on each flight before its departure. These groups include pilots (cockpit crew), flight attendants (cabin crew), maintenance crew, ramp agents, baggage-handling crew, cargo agents, fueling agents, customer service agents, gate agents, catering agents, aircraft cleaning agents, and operations agents or dispatchers. While the personnel in these groups differ in their qualifications, nature of work, workloads, and salary, they are all equally important for the departure of the flight. It is important for airline management to adequately set the work plan for each group, facilitate their work, and alleviate any possible conflict between them.

A pilot is a certified person who flies the aircraft of a certain aircraft fleet.

Typically, each type of aircraft requires a certain number of pilots with certain specified qualifications. Flight attendants are airline staff employed primarily for the safety of passengers onboard. Their secondary function is the care and comfort of the passengers. The maintenance crew (maintenance) is responsible for servicing and repairing the aircraft to make sure that it is operational. Typically, maintenance performs several pre-specified mandatory service checks on the aircraft before departure, as specified by the manufacturers. Maintenance also performs several scheduled service checks on each aircraft in operation. Ramp agents help guide the aircraft to taxi in, park, and taxi out at the gate. Baggage handlers and cargo agents transport, load, and unload baggage and other cargo to and from the aircraft. Fueling agents provide fuel to the aircraft before departure or at intermediate stops in the flight. Customer service agents assist passengers with check-in, seat assignments, seat upgrades, and itinerary changes. Gate agents ensure that only authorized persons and passengers have access to the aircraft.

Catering agents provide meals and beverages to be consumed on the flight. Aircraft cleaning agents clean the aircraft and the lavatories. The operations' agent or dispatcher coordinates the flight plan, weight, fuel requirements, and any weather-related or operations delays that are issued to the flight.

STRUCTURE OF THE AIRLINE INDUSTRY

In order to avoid confusion about the term industry, it is best to define it at the outset.

An industry can be defined as a number of firms that produce similar goods and services and therefore are in competition with one another. In this sense, the airline industry is a segment or part of the broader air transportation industry. Several hundred companies across the world engage in the carriage of persons or goods by air. For example, American Airlines earns revenues in excess of $20 billion a year, while the smallest may operate a single plane only several months a year. Broadly defined, the airline industry consists of a vast network of routes that connect cities throughout the country, and indeed, the world. Over this network, a large number of airlines carry passengers and cargo on scheduled service.

STRUCTURE OF THE AIRLINE INDUSTRY

Growth and Regulation

To clarify the structure of the industry at the outset, it is useful to define the industry.

When the initial domestic civil aviation legislations were passed in countries, only a handful of air carriers operated on regular schedules over prescribed routes, and when they received government certification, they became known as certificated route, scheduled air carriers, a term that is used to this day. The act empowered the Civil aviation authorities to structure the interstate airline industry through regulation of passenger fares, air mail rates, route entry and exit, mergers and acquisitions, and inter-carrier agreements. These authorities immediately "grandfathered" the routes of 23 existing airlines, which later became known as trunk carriers (a term borrowed from the trunk railroads of the day). By definition, trunk carriers were airlines certified to operate on medium- and long-haul interstate routes.

These carriers came under Section 401 of the board's regulations and thus were sometimes referred to as 401 carriers. To be exempt from 401 certification, a carrier could not exceed a takeoff weight of 12,500 pounds (roughly the weight of a DC-3), which effectively limited aircraft to 19 passengers. Typically, two or three carriers provided service in a given market, although in some instances routes were covered by only one carrier. The CAB set standard fare levels to ensure cross-subsidization between profitable and unprofitable routes. Carriers were required to charge equal fares for equal distances. Cost increases were passed along to customers, and the CAB allowed the airlines to earn a reasonable rate of return.

Originally, there were two general classes of common-carrier air transportation: (1) the trunk airlines, which provided scheduled service on fixed routes, and (2) small no transport carriers, principally operating from a fixed base, which furnished service on request, without schedules. For the nonscheduled carriers, transportation services were incidental to the principal business activities of sale and service of aircraft and flight instructionAfter World War II, a number of enterprising aviation entrepreneurs purchased war surplus DC-3s (C-47s) and DC-4s (C-54s) and began to transport people and cargo for compensation or hire with no fiixed routes or schedules,

much in the manner of tramp steamers. These operations, usually cutthroat in the worst sense of the term, became known as nonscheduled, or "nonsked," air carriers to the public and as "large irregular air carriers" to the CAB, which was powerless to regulate them until the Civil Aeronautics Act was amended by Congress. The act was amended after World War II to create supplemental air carriers and supplemental air transportation2 so that such operations also required certificates of public convenience and necessity. Originally designed to supplement the capacity provided by the trunk carriers, by the 1960s the supplemental air carriers had truly become competitive carriers, and by the 1970s the name supplemental had lost all meaning. Some carriers provided scheduled passenger and cargo services, whereas others concentrated on cargo only.

In the postwar period, there were also many feeder routes to be granted. The trunk lines claimed that they had grandfather rights (original certification) to provide such service feeding into the trunk routes, but their pleas were to no avail; the CAB chose instead to certificate a whole new level of service. The CAB assured the trunks that the feeders would be carefully watched and not permitted to provide service between the major metropolitan areas. The CAB awarded each local-service carrier a regionally centered route system that fed the trunks with additional passengers. These local-service carriers, which provided intrastate service to small communities, were exempt from CAB economic regulation, and many were eligible for government subsidies to cover operating losses. The charter services charged lower fares, did not operate published schedules, and were also exempt from CAB regulations.

Nineteen local-service airlines were certificated by the board between 1945 and 1951. Some of the first feeder lines, as they became known, were Allegheny (now US Airways); Mohawk and Lake Central (now part of US Airways); Frontier (now part of Continental);

During the 1950s and 1960s, subsidization of most local-service and many trunk routes continued. Local subsidy costs, exacerbated by fares deliberately set below marginal costs in accordance with the CAB formula, escalated rapidly as the local-service carriers added routes and replaced their original DC-3 aircraft with larger equipment. In an effort to reduce subsidy costs, the CAB at first shifted some low-density trunk routes to the local service carriers. When this approach failed, longer and potentially more profitable routes, often in direct competition with the trunk routes, were awarded. Despite this overlap of local-service and trunk carrier routes, the CAB largely maintained its vision of a bi-level industry. Trunk airlines served long-distance routes between major cities, while local-service carriers provided connecting service from smaller cities to trunk destinations.

Consequently, many itineraries required a change of airlines. Because of poorly coordinated flight schedules, significant delays awaiting a connecting flight were common. Faced with suppressed routing and pricing options, the airlines competed on services such as meals, movies, and seating comfort.

Despite these problems, the industry grew rapidly, enjoying more than a tenfold growth in passengers between 1950 and 1970. Technological advances embodied first in the long-range DC-6 and Constellation aircraft and then in the first-generation commercial jet transports

provided steady improvements in productivity. Jet transportation greatly increased the trunks' capacity levels and allowed them to schedule more frequent flights. Airlines that added capacity gained a disproportionate share of market traffic because customers were most likely to call the airline with the widest range of travel options. The purchase of new aircraft left both the trunk and the local-service carriers with weakened earnings and balance sheets, while competition intensified in the high-density markets, where business travelers sought maximum convenience. In the meantime, subsidies to the local-service carriers continued to increase. Air fares, though high, remained nominally stable but declined in real terms throughout the period. High fares, however, limited air travel to business and affluent passengers.

The industry's problems worsened during the Arab oil embargo of the 1970s. Between 1969 and 1978, fuel costs rose 222 percent (to 20 percent of operating expenses); inflation boosted labor costs (to 45 percent of operating expenses); and the stagnation of the gross national product curtailed demand growth (from 18 percent to 4 percent per annum).

Calls for regulatory reform first appeared in the early 1970s. Prohibited from competing on fares and routes, carriers responded by increasing flight frequency, lowering seating density, and adding ever more extravagant in-flight service. Anticipating continued rapid traffic growth that accompanied the introduction of jet aircraft, the major carriers placed new wide-body aircraft in service, exacerbating existing overcapacity. Load factors fell from 70 percent in 1950 to 50 percent by 1970. With the transition to jet aircraft complete, productivity gains that had cushioned the economic consequences of falling load factors slowed. The industry's financial health weakened.

The CAB responded to the deteriorating financial conditions by increasing its regulatory interventions. In addition to the ongoing denial of new carrier applications, it imposed a route moratorium on existing carriers, approved a 20 percent fare increase, and sanctioned capacity limitation agreements among the trunk carriers. These actions raised alarm outside the CAB, resulting in a consensus in government and academia that regulatory distortions imposed unacceptable burdens on the economy and society and did little to address the industry's underlying structural problems.

Sensing a winning issue, Senator Edward Kennedy held congressional hearings in 1975 sharply critical of CAB policies. Studies comparing intrastate airlines operating outside.CAB control with the trunk carriers projected fares 50 to 70 percent lower if the industry was deregulated.

Deregulation

In response to the criticism, the CAB reversed its policies, beginning with the approval of new route applications. In 1977, it consented to American Airlines' request for "super saver" discounts some 45 percent below existing coach fares. When American Airlines' traffiic grew as much as 60 percent in response, the solution to overcapacity seemed at hand. Other carriers quickly fiiled and received CAB approval for similar discounts. De facto deregulation was under way.

In 1978, now with the active encouragement of new CAB Chairman Alfred Kahn, Congress passed the Airline Deregulation Act. The act mandated that the CAB phase out its route approval authority over three years and its regulation of fares over fiive years, andthat it pass its remaining functions to the Department of Transportation. The CAB ceased operation at the end of 1984.

MAJOR AND NATIONAL CARRIERS

That deregulation was a landmark event in the history of the U.S. airline industry is illustrated by the fact that 5 of the top 12 airlines of 1978, as measured by revenue passenger miles (RPMs), no longer exist (see Table 5-1). Eastern (no. 4) and Braniff (no. 8) went bankrupt; Western (no. 7) was absorbed by Delta; National (no. 10) was absorbed by Pan Am; Pan Am (no. 6) broke itself up for parts, with most going to Delta and United; the remnant of Pan Am then dissolved in bankruptcy. Deregulation fueled a trend toward concentration of business with a new cluster of "mega-carriers," with a number of small and midsize airlines being absorbed in the process. By the end of 2004, the top five carriers accounted for 74 percent of the business (see Table 5-2). In contrast, in 1978, under CAB control, the top five airlines accounted for 68 percent of the RPMs of the top 12.

The immediate consequence of deregulation was that the established carriers faced competition on many fronts. First, they competed vigorously among themselves; motivated in part by the belief that market share would determine the ultimate survivors in a restructured industry. This meant new routes and lower prices, which led to more available seat-miles but lower load factors, as capacity outstripped new passenger traffic, and to lower passenger revenue yields because of the reduced fares.

The competition within the established industry was intensified by three innovations pioneered by the major carriers in the early 1980s that collectively represent a radical change from the regulated era. Although each of the measures offered initial competitive advantage to the first movers, in the aggregate these innovations appear to have contributed to the very high volatility of industry revenues. First, airlines established "hub-and-spoke" route structures, designed to funnel traffic from outlying regions for further transit, at very high load factors, to major destinations. But hubs are very expensive to establish and maintain because of the high infrastructure costs; the high fixed costs hinder easy adjustment of route structures in response to changing patterns of demand, and the overall route structure produces more connections on long-distance routes, which is disfavored by full-fare business travelers. The hub-and-spoke structure also left the airlines vulnerable in the 1990s to low-fare carriers that fly point to point between destination city-pairs. Among other factors, the point-to-point carriers gain the advantage of higher aircraft utilization than do the hub-and-spoke carriers, which have to provide time in their schedules of long-distance routes for the arrival of feeder flights.

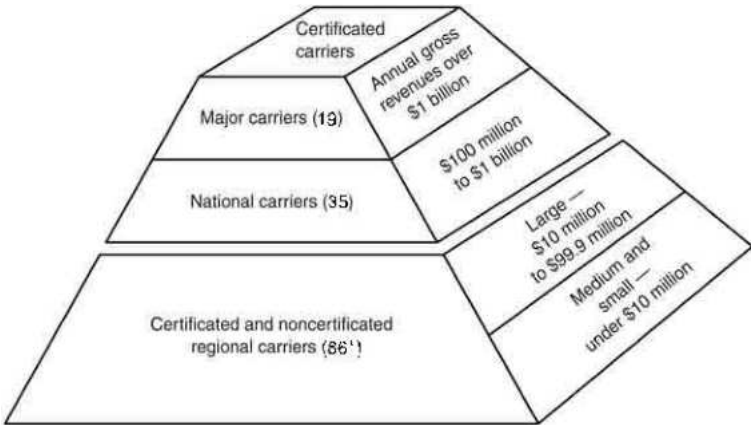
Second, the airlines adopted frequent-flier programs designed to enhance brand loyalty among business travelers and to exploit the differences between regional and national (or international) airlines in terms of more desirable destinations. The frequent-flier programs proved to be

expensive to administer, and the potential liability of accruing free travel credits was an unwelcome overhang on an airline's financial statement. Moreover, the frequent-flier programs came to play a somewhat perverse role in the design of route structures, in which destinations were added or retained to avoid the potential loss of frequent fliers.

Third, the airlines developed sophisticated reservations systems that they used for at least two purposes: (1) to skew in their favor the display of hauling information on the screens that were used in travel agents' offices and (2) to establish yield management programs. In accumulating data about traffic patterns and demand for particular flights, airlines could engage in sophisticated price discrimination in the effort to maximize revenues. For example, based on historical information and current demand, an airline could decide seat allocations for cut-rate, advance-planning leisure travelers versus full-fare, last-minute business travelers. However, the combination of hub-and-spoke route structures and such efforts at fine-tuning led to complicated rate structures that facilitated price competition (because disciplining defectors from a particular benchmark fare was harder) and thus lowered passenger revenue yields.

The established carriers also faced competition from new entrants with significantly lower cost structures. Prominent examples in the early 1980s were People Express and New York Air, which brought an extremely low fare structure into lucrative markets in the northeast, and Southwest and Texas Air, which operated on a similar basis in the southwest. These new entrants were not part of the industry's collective bargaining structure; they paid their employees well below the industry average, often 50 percent below industry scale, and, because of the absence of work rules, employed far fewer employees per available seat-mile. The consequence of the dramatically changed competitive environment was financial distress for many carriers. For example, in an effort to operate on a national (and international) scale, Braniff expanded very rapidly but failed to fill seats. Thus, the airlines are an example of an industry sector subject to exogenous shocks that have undermined many of its previous ways of doing business. Not only did deregulation expose the airlines to powerful competitive forces that undermined profitability, but it also eliminated the implicit protection under government regulation against collapse and bankruptcy. As a result, the industry is making a transition to a new structure.

At the top of the pyramid shown in Figure 5-1, and foremost among the carriers that make up the airline industry, are the major and national carriers. The 54 carriers that were included in these two categories at the beginning of 2004 hold certificates of public convenience and necessity and operate scheduled and nonscheduled or charter services over medium- and long-range national and international routes serving large population centers.



REGIONAL CARRIERS

Regional air carriers are classified as large, medium, or small, depending on their annual gross revenue and whether they hold a certificate of public convenience and necessity from the DOT. Large regionals are certificated carriers with annual gross revenues between $10 million and $99.9 million. Medium regionals are certificated carriers with annual gross revenue less than $10 million. The small regionals, commonly referred to as commuters, are non-certificated carriers.

Early Growth

Out of several thousand air taxi operators in January 1964, only 12 offered scheduled services, all to non-certificated points. By the end of 1968, there were over 200 scheduled air taxi operators. This explosive early growth in what became the regional/commuter airline industry resulted in part from the economic opportunity created by the service gap left by the withdrawing local-service carriers. Another important factor was the availability of new aircraft that were small enough to be exempt from CAB economic regulation yet large enough to carry profitable loads in scheduled short-haul operations and economic changes in the 1960s improved the climate for the growth of scheduled air taxis. In 1964, the FAA promulgated Federal Aviation Regulation (FAR) Part 135, which defined the operational and safety rules of the industry. In 1965, the CAB amended its regulations to allow these carriers to transport mail and to provide service between certificated points, often as replacements for trunk or local-service airlines. In1964, American Airlines contracted with Apache Airlines to replace it in serving Douglas,

Arizona; this was the first “air taxi replacement agreement.” In 1968, Allegheny Airlines (now US Airways) greatly expanded this concept by contracting its unprofitable routes to 12 independent commuters operating under the name “Allegheny Commuter”; this network continues today. The CAB officially recognized the commuter industry in 1969, defining a commuter air carrier as an air taxi operator that either (1) performs at least five round-trips per week between two or more points and publishes flight schedules that specify the times, days of the week, and origins and destinations of such flights, or (2) transports mail by air under contract with the U.S. Postal Service. By August 1978, 26 commuter airlines were providing replacement service for certificated carriers at 59 points, mostly without direct financial assistance.During the 1970s, passenger enplanements on commuter carriers grew at an annual rate of slightly over 13 percent, compared with a 7 percent growth rate for the combined trunk and local-service airlines and a 3 percent annual growth rate in real gross national product.

As part of airline deregulation in 1979, the trunk and local-service carriers began their second stage of withdrawal from smaller communities. The commuters saw yet another opportunity to serve the traveling public and eagerly moved to provide service. Under congressional mandate, communities that stood to lose service as part of deregulation were placed under the Essential Air Service (EAS) program. As of early 2006, more than 114 communities were served by the program in the continental United States, Alaska, Hawaii, and Puerto Rico.

Role of the Regional Air Carrier

Today, the regional/commuter airline segment is an integral part of the nation's air transportation system. Regional carriers provide regularly scheduled passenger or cargo service on aircraft predominantly seating fewer than 60 passengers or holding cargo with an 18,000-pound or less payload. Regionals fly pursuant to schedules published in widely used airline schedule guides.

A typical regional flight operates over a trip distance of 100 to 400 miles and at lower altitudes than flights of the long-haul carriers. Regionals operate well-timed frequent flights from outlying communities to the associated hub airports to "interline," or connect, passengers and cargo with other scheduled flights. Seventy percent of all regional passengers make such connections.

Although the growth period of regionals has been relatively short and not without problems, continuing efforts by the industry principals are playing a significant role in helping to forge an integrated and complete air transportation system. Today, 9 out of every 10 airports in the United States receiving scheduled air transportation are served by a regional air carrier. By year-end 2005, regionals provided frequent and timely air service to 664 airports, with 664 of these communities depending exclusively on regional airlines for scheduled air transportation. By contrast, the major airlines served approximately 32 percent of the total.

The 94 certificated regional air carriers provide short-haul air service to small and medium-size communities across the country, typically linking those communities to the nation's larger airports in a hub-and-spoke network. This network of regional air services interconnects each city with others in the system, and the regional airline segment increasingly has become more integrated into the system.passenger enplanements experienced a massive increase during this period. Revenue passenger miles increased from 2.09 billion in 1981 to 56.21 billion in 2004.

Code Sharing

Approximately 90 percent of regional/commuter airline passengers connect to or from major airlines, saving passengers both time and money, as a result of tight marketing partnerships between regionals and majors known as code sharing. Today, close to 80 percent of U.S. regional/commuter carriers offer their service as part of a major airline network and, in the process, have created an integrated service, making regional/commuter airlines a vital link between small communities and the national air transportation system.

Begun as simple marketing arrangements between the majors and their regional/ commuter airline partners in 1984, code sharing has developed into sophisticated liaisons that may or may not include some ownership by the major airline. Most code-sharing regional/commuter airlines adopt the paint schemes of their major counterparts, such as USAir Express, United Express, US Airways Express, American Eagle, Continental Express, and Northwest Airlink. However, some, such as Delta Connection (also known as Comair), allow their regional partners to retain their own livery. Although the majority of the code-sharing regional/commuter airlines are independently owned and operated, together with their major partners they provide improved service to the small-community passenger. These interline agreements have been attractive to the

small carriers, because they offer them access to more passenger traffic, limited airport facilities, financial support, and marketing intelligence. These marketing partnerships enable regional/commuter airline passengers to check in at their local airport, thereby avoiding long driving times and expensive parking fees. In addition, passengers can obtain boarding passes not only for their initial outbound flight but for their entire trip.

The overwhelming success of these partnerships has afforded the opportunity for regional/commuter partners to upgrade their fleets with new-generation aircraft, complete with the same avionics used by the major carriers. With this new equipment have come new industry service standards that mirror the standards passengers have come to expect from major carriers. The integration of regional/commuter and major airline schedules has also meant well-timed flights, providing fast hub-airport connections. Even for those whose destination is the hub city, regional/commuter airline service offers the out-and-back-in-one-day business trip.

These partnerships have also meant tremendous cost savings to regional/commuter airlines as their major partners assume the reservations functions, which, at the same time, increased passenger and travel agent convenience by offering one-stop shopping. In addition, code sharing means lower air fares, with many regional/commuter segments covered by a small “add-on” fare, sometimes as little as $10. Frequent fliers are also offered mileage credits as much as triple that of the 250-mile average stage length of a regional/ commuter airline flight.

In addition, these marketing partnerships mean that small communities, which might otherwise not be served by major jet aircraft, become part of the major airline network. In providing that vital link, regional/commuter airline partners offer savings in both fares and overall transportation costs, frequent departures, convenient connections, and shorter business trips for those not connecting. In short, they have become an integral part of the national air transportation system.

Flight Equipment

The majority of today’s regional/commuter airline fleetare prop-jet-powered. New-generation equipment affords the same or more advanced avionics and cockpit instrumentation as even the largest commercial carriers have. In 2004, 27 percent of the fleetwere turboprop planes, 14 percent were piston aircraft, and 59 percent were turbojets (Table 5-4). The regional carriers continue to rely on jet aircraft for a significant portion of their service. All trends indicate regional/commuter airlines will continue to expand in size moving from small turbo-prop aircraft to an increased focus on jet aircraft capable of flying a larger number of passengers over greater distances. However, regional/commuter airlines will continue to operate a mixed aircraft fleet as it affords the flexibility to tailor aircraft size to market and frequency needs.

Network expansion will be a key ingredient in the future success of regional/commuter airline growth. As the regional network evolves, competition between regional/commuter carriers and major carriers will increase. In some cases, regional/commuter carriers are already stepping on the toes of the majors causing great concern for both sides. There comes a point with successful

regional/commuter carriers when they must decide to grow from being a big fish in a small pond to becoming a small fish in a big pond.

Transportation of cargo has also become important to the bottom line of many regional/ commuter air carriers, and the growing all-cargo fleetreflects this trend. The number of aircraft utilized solely for cargo carriage grew to 1,438 planes in 1996.

Airline Statistics

To fully understand the structure of the airline industry, it is important to review traffic and financial statistics, including performance measurements. Several excellent, readily available sources can provide this information in a more appropriate and timely manner than can be presented in a textbook. These include the annual reports from the Air

Transport Association of America and the Regional Airline Association. Two annual FAA publications that are particularly good are the FAA Statistical Handbook of Aviation and FAA Aviation Forecasts. Another source for annual statistics and in-depth analysis of all segments of the airline industry is the June edition of Air Transport World. Finally, the World Aviation Directory, published quarterly, provides a comprehensive industry review and analysis along with statistics.

Airline Certification

Licensing functions are the responsibility of the Office of the Assistant Secretary for Policy and International Affairs of the Department of Transportation. Ordinarily, the assistant secretary or his or her delegate performs these functions for the DOT, but the secretary of transportation may exercise this authority in lieu of the assistant secretary. Staff actions are subject to review by the assistant secretary and ordinarily are effective 10 days after the action is served.

For the licensing applications subsequently described, the requirements for the filing of documents, including the number of copies to be filed, are specified in DOT procedural regulations.

Industry Agreements

Regional airlines have become full partners in the air transportation system. The use of common ticket stock, shared airport facilities, commingled reservation schedules, joint fares, and interline agreements for the handling of baggage, cargo, and other express freight allows regional airlines to play an important role in an integrated system of air transportation.

Approximately half of the top 25 regionals are completely or partially owned by national or major airlines. This trend is expected to continue. Agreements between the larger carriers and regionals can be beneficial to both parties when the aim is to control a bigger share of the traffic. Few regionals have been able to develop enough of their own origination and destination (O & D) traffic to survive in today's competitive market without a partner feeding them traffiic. However, as regional airlines grow, this trend is expected to change. Similarly, the larger partner benefits from having a regional carrier feeding traffiic into its major hub. In a study titled "The

U.S. Regional Airlines Industry to 1996—Markets, Competition and the Demand for Aircraft," the Economist Intelligence Unit of Economist Publications in New York states that the larger carriers now control, through marketing partnerships and acquisitions, three-quarters of the trafficflown by regionals.

Identification Codes and Airline Designators

Every airline that operates scheduled passenger or cargo services with other airlines requires an identification code. The code is printed as the first three digits of the airline's passenger traffic documents and cargo air waybills and identifies that airline for interline accounting purposes.Airlines with headquarters in the United States or its territories and possessions request a form code from the Air Transport Association. Airlines with headquarters outside the United States or its territories and possessions request the form code from the International Air Transport Association. Each airline that operates scheduled passenger or cargo services and publishes its schedules in industry schedule guides or that participates in the airline communications networks, such as ARINC or SITA, needs an airline designator. The two-letter airline designators are assigned and administered by the International Air Transport Association on behalf of the airline industry.

Publishing Schedules

The flight schedules of passenger-carrying airlines are published in the Official Airline Guide (OAG), the ABC World Airways Guide, and the American Express Sky Guide; schedules of cargo-carrying airlines are published in the OAG Air Cargo Guide, the ABC Air Cargo Guide, and Hereford's Cargo Guide. There is no charge for publication of direct-flight schedules and fares of commuter air carriers.Members of the ATA's Passenger Council have established the Interline Traffic Agreement—Passenger. All scheduled airlines may become parties to the agreement. The agreement becomes binding between parties upon execution of a concurrence.

The agreement gives each airline party the right to sell transportation at the appropriate fares over the lines of other parties with which it has a concurrence and to issue interline tickets providing for such transportation. Parties are required to honor interline ticketsissued by another party with which it has concurred. Where interline tickets have been issued under the agreement, the originating airline agrees to check the passenger's baggage to the fiinal destination at the first stopover point, and the down-line airline agrees to accept and transport such baggage.

Interline Agreements

Interlining of air freight within the industry is an effective means of expanding air freight services to customers. The ATA has two specific air cargo agreements available to major, national, and regional carriers: the Air Freight Procedures Agreement and the Small Package Shipment Agreement. Each is a multilateral agreement that prescribes uniform documents and labeling and handling procedures for regular air freight and small-package services.

Airlines may also participate in the International Air Transport Association's multilateral interline traffic agreements as member or nonmember carriers.

Universal Air Travel Plan: Begun in 1936, the Universal Air Travel Plan (UATP) card is one of the world's oldest credit cards. During the early years, the UATP card covered only U.S. domestic airlines. It gained worldwide applicability on October 1, 1948, when international routes were brought into the plan. Today, the UATP card is good for transportation on practically all the world's scheduled airlines flying domestic and global routes. As of 2006, anticipating airlines now number more than 220.

Those carriers desiring to subscribe to this airline credit service can contract through an individual airline by meeting the individual carrier's requirements. Thirty-two airlines("contracting airlines") are authorized to issue UATP cards, and the cards are honored by all participating carriers. The contracting airline bills the subscriber on a monthly basis for all air transportation used, regardless of the number of airlines involved.

Travel Agencies: As the travel agency industry grew and as travel agents began to generate a larger proportion of airline tickets, a need arose for an efficient system of reporting and accounting for ticket sales. What emerged was the Standard Agent's Ticket and Area Settlement Plan. The plan's most important innovations were a standard ticket stock and a single source to which travel agents reported and accounted for airline ticket sales. Travel agents were issued supplies of standard ticket stock with no carrier identification. In issuing a ticket, the agent fills in the name of the airline on which the seat is being sold. Every week, the travel agent forwards reports of tickets sold to a designated area bank. The agent receives a computerized sales report from the bank for each reporting period. The sales report provides important data on each ticket issued, as well as statistical summaries for the entire reporting period.

The commission paid to travel agents was deregulated in June 1980, allowing airlines to set the commission. With the Interline Settlement of Agent-Issued Documents Agreement, the ATA's Passenger Council has set up a procedure for settling interline service charges at a periodically determined commission rate.

AIRLINE BUSINESS AND MARKETING STRATEGIES

In one sense, the news here is good in that in today's airline industry there is no single, unique strategy which must be followed if success is to be achieved. There is a range of possible strategies available. What is essential, though, is that one strategy must be selected from this range. It must then be implemented well, and continued on a long-term basis. The aim of this Chapter is to set out and discuss the types of possible strategy, and their advantages and disadvantages.

PORTER'S "FIVE FORCES" AND THEIR APPLICATION TO THE AIRLINE INDUSTRY

In understanding these strategic options, a useful start can be made by looking at some of the ideas of the Harvard Professor, Michael Porter. Porter states that in different industries, strategic issues are colored by the interplay of the Five Forces of the rivalry amongst existing firms,

substitution, new entry, the power of customers and the power of suppliers. We will examine each of these in turn.

Rivalry amongst Existing Firms

Porter argues that, in many industries, often little of the true competition and the drive for change comes from long-established firms. These long established firms often resemble one another in terms of the strengths which they have, and in their problems and weaknesses. They therefore can only identify benefit from aggressive competition at the margins of their activities.

In the air transport industry, the policies of the long-established airlines of Europe illustrate this point only too well, especially in their short-haul markets. There are now no regulatory reasons which preclude intense competition between them. Since April 1997, the airlines of the European Union have competed in a Single Aviation Market where there have been only the very loosest controls over entry, capacity and fares. This represented a major change when it took place compared with the tight regulation characteristic of the previous system. Yet, one would hardly know that this change had occurred if one had merely looked at the reaction of the old-established airlines to it. They continued to fly mostly similar aircraft (usually drawn from the Airbus A320 family), and placed in them identical or near-identical seating configurations. Frequencies and timings remained very similar, with few airlines prepared to allow their competitors a frequency advantage. The on-board products were mostly comparable, and did not change. Finally and most tellingly, until recently these airlines pursued an almost identical pricing policy. Very high fares were charged for seats in Business Class, and for access to Economy tickets which allowed full flexibility. Lower fares were also on offer, but these had had tight restrictions attached to them, restrictions which were mainly designed to prevent business travelers using them.

The result of such policies was that they made it much easier than it should have been for new Low Cost Carriers to grow in Europe, and for them to have a dramatic effect on the economics of the long-established firms. British Airways, for example, lost nearly £250 million on its intra-European network during its 2002/2003 financial year.

Substitution

Porter argues that disturbance to the competitive equilibrium set up by the long-established firms can come from two possible sources, the first of these being that of Substitution. Substitution occurs when firms in another industry find a new and better way of meeting the same customer needs as are being targeted by the existing players.

There are a number of Substitution issues affecting airlines at the present time. Of these, potentially the most serious is the effect of electronic methods of communication on the market for business air travel. Videoconferencing, teleconferencing and email all have the potential to mean that business travelers will travel less, and still satisfy their needs for effective communication. At the time of writing, there are worrying signs that this is exactly what is

happening, an effect which is likely to increase still further during future downturns similar to the one which followed the September 11 attacks in 2001.

Surface transport, especially by rail, also raises important substitution issues. As we have seen, unlike airlines, railways can provide city-centre to city-centre travel, and have been shown to severely impact the business travel market once these city-centre to city-centre journey times can be brought down below three hours.

The air freight industry is also being affected by Substitution issues. Email is substantially reducing the market for the movement of urgent documents by air. Also, newspapers do not provide the lucrative air freight commodity they once did. They still lose their value completely soon after they have been published. The problem is, though, that today media publishers are increasingly reaching their readers through the Internet, or by setting up satellite printing stations which enable newspapers to be printed simultaneously in a large number of different markets. They therefore no longer have to make use of air freight.

New Entry

The second of the forces which may disturb the competitive equilibrium amongst the existing players is that of new entry. In some industries, new entry is difficult or impossible. In others, it is commonplace. In the modern aviation industry, the latter is very much the case, especially in short-haul, point-to-point markets. This is because of the many possible so-called "Barriers to Entry", most have become low or are now non-existent.

A first possible barrier to entry may result from regulatory limitations. It is true that, there are still regulatory barriers to entry in many international markets, and airlines are constrained in their market entry policies by out-of-date and anachronistic limitations on ownership and control. However, it is now the case that many of the world's largest domestic markets, such as those of the United States and the European Union, now operate without any significant entry controls, apart from those applying to so-called Cabotage Rights.

In others cases, resources may act as a Barrier-to-Entry. If vital resources are unavailable or very costly, entry will clearly be constrained.

Significant though slot constraints already are, with a likely worsening of them in the future, radical strategies are possible which find a way round them. Slot constraints may provide some comfort to existing airlines in Europe today, but they can derive little more from the remaining possible resource constraints to entry. Especially during downturns such as the one experienced during 2002 and 2003, resources to underpin entry can actually be remarkably cheap and plentiful.

This is certainly the case with the question of the aircraft fleet that will be needed by a new entrant airline. In a recessionary period, aircraft manufacturers will be prepared to strike very attractive deals for the white-tailed aircraft which sometimes result from order cancellations. Also, there will be large numbers of parked aircraft – many of them owned by leasing companies

– where the owners will offer extremely low lease rates in order to get their idle aircraft flying once again.

Staff resources – especially of pilots and mechanics – will also be important. Again, in a recessionary period many trained people will unfortunately lose their jobs, and may well be prepared to take new ones at relatively low salaries and wages in order to obtain employment.

As a final, and, at first sight, odd feature of resource constraints on entry in the aviation industry, it will always be possible for a new entrant to buy the support services, such as maintenance and ground handling that it needs. Many airlines have built subsidiary businesses offering such services and they will be prepared to sell these to a new entrant, even if the new entrant's business plan involves competing with them. They will reason that if they do not meet the need, this will not stop the new entrant. Instead, the required services will be bought elsewhere, denying the first airline some useful revenue.

Several more issues need to be covered in assessing the nature of barriers to entry in the airline business. Some industries are characterized by marked Economies of Scale, where lower unit costs can be obtained by large-scale producers. Many heavy industries such as steel, chemicals and car-making are like this. In them, existing firms are likely to be protected against entry because they will have been able to achieve a scale of production which is unlikely to be available to a new entrant.

In the airline business, there are some aspects where existing players are protected against new entry by scale economies. In particular, hubbing operations where short-haul passengers are collected together in order to feed long-haul services are increased in their effectiveness by being undertaken at a substantial scale. It is hard for small new entrants to break in. In point-to-point markets, however, no such protection for incumbents exists. Economies of Scale in areas like pilot training and maintenance quickly run out with increasing size, and are counterbalanced by the bureaucracy and poor staff morale often characteristic of large airlines.

In some industries, incumbents have a lot of protection against new entrants because of so-called Learning Curve effects. In them, mature firms achieve lower costs than new entrants because the intricacies of the production process mean that substantial experience is required before optimum cost levels can be achieved. Aircraft manufacturing and aero-engine production both illustrate this from within the aviation industry, with unit costs of production falling steadily as an airframe or engine family matures. Airlines, on the other hand, seem to show the opposite effect, with the concept of Start-up Economics a well-established one. Airlines often achieve their lowest costs of operation during the first five years of their existence. Later, costs tend to rise as more staff ascend seniority scales to higher rates of pay, and bureaucracy and declining staff morale start to impact on cost levels. The existence or start-up cost advantages does of course, make the task facing a new airline a significantly easier one.

One final issue with regard to entry into the airline industry is difficult to analyze, but very important. Over the last twenty years, the list of airlines which have entered the industry and then left it again through bankruptcy is a depressingly long one. All the evidence one could possibly

require is there to illustrate the point that investing in and setting up a new airline is, at best, highly speculative, with an overwhelming likelihood of failure. From this, one might assume that new entry into the aviation industry would largely be a thing of the past, especially given the depressed state of the industry in the early years of the new century. Nothing could be further from the truth, with the pressure of entry seemingly as strong, or stronger, than ever. One explanation for this apparent contradiction is that aviation is seen as a glamorous and exciting industry by many, and that the dream to set up and own one's own airline is a continuing one for those with large egos and deep pockets. Industries with dirty, unpleasant processes at their heart do not have the same appeal, despite the fact that profits and returns on capital may be much better within them. The English expression, "where there's muck there's brass" is a telling one.

As an overall conclusion to the question of entry, incumbent airlines must prepare themselves for a continuing challenge from new entrants, especially in their short-haul, point-to-point markets.

Power of Customers

Porter argues that the power of their customers will be a crucial determinant of profitability for the firms in any industry. In turn, customer power will be related to two variables: the number of customers a firm has, and the existence – or otherwise – of so-called Switching Costs.

In principle, the point about the number of customers is an obvious one. If a firm has many customers and some of these defects to the competition, there will still be a large number of customers remaining. If, on the other hand, the firm has only two or three customers, the loss of one of them will result in a third or more of its business being lost. In such a situation, customers will have extreme amounts of bargaining power. They will be able to cut deals on terms which are extremely favorable to them, holding down the profits of the companies from which they are buying.

The structure of the travel agency industry also changed during the 1990s. In many countries, life became harder for the smaller, independent agent. Instead, an increasing share of the market was held by large, often multinational, agency chains, who achieved substantial power as a result of their ability – often exaggerated, but still significant – to switch passengers between airlines according the commissions they were being paid.

Such a trend did not arise by accident. Many airlines adopted a policy of paying so-called over-ride commissions to agents according to the volume of business delivered to them. In the short term, such a policy gained them the greatest amount of revenue. It did, though, give important advantages to large travel agents who could meet their revenue targets forever-rides. These agents were in turn able to use their higher commissions to fund market share battles against their smaller rivals, further cementing their domination.

A further issue regarding the size of the airline customer base concerned the selling of seats to price-sensitive leisure travelers. Again during the 1990s, many airlines tended to opt out of retail marketing of these seats. Instead, this job was increasingly left to so-called Bucket Shops and Consolidators, who treated the airlines as suppliers of cheap seats which in turn could be sold on,

at a profit, through their own retail marketing outlets. Firms such as Trailfinders in the UK and Euro-Air in the Far East achieved substantial dominance as a result. As they did so, they were progressively able to change their role from one of selling a small number of otherwise unsold seats, to one where they were able to dictate prices to carriers, negotiating deals which were very attractive to them, but which were much less so to the airlines supplying them.

The last five years have seen a revolution in the distribution channels used by airlines. The Internet has become a very important channel, and from the issues raised in this section, it is easy to see why. The Internet allows carriers to begin the process of broadening their customer base once again, and to make better contact with the true sources of their revenue. They are therefore able to address the problems of escalating commission costs and falling yields, which were a clear consequence of the mistaken polices of the 1990s.

In the aviation industry, a common situation where a customer turns into a competitor occurs when a tour operator grows bigger and bigger, giving larger amounts of business to existing charter airlines. Often, a point arrives where it will make sense for the tour operator to buy its own aircraft, in order to set up an airline to carry its own passengers and perhaps also the compete in the open market for other airlines' passengers as well. The tax benefits associated with aircraft ownership can be an added incentive to do this, given that tour operators normally do not have significant capital assets to use to offset against their tax liabilities.

The subject of so-called Integrated Carriers is also an interesting one with regard to the question of customers becoming competitors. Integrated Carriers are freight companies specializing in the movement of relatively small, urgent, packages. When they begin service on a new route, it is normal for them to offer substantial amounts of business to existing combination airlines. This helps the Integrators to grow their traffic. Unfortunately for the combination airlines, once they have done so, it has been common practice for them to then put on their own specialist freighter aircraft, cutting out of the equation the airlines that first helped them to grow.

The question of Switching Costs is an equally difficult one. In some industries, there are very substantial costs associated with switching from one supplier to another. Airline fleet planning illustrated this point very well. An airline only using, for example, Boeing aircraft will have built up a large investment in Boeing spare parts, Boeing-orientated flight simulators, and in the training of its staff to be familiar with Boeing products. There will therefore be a strong financial incentive to continue to buy from Boeing. If Airbus is to break the stranglehold of Boeing at such an airline, they will have to offer very large discounts on the purchase price of their aircraft, in order to effectively pay themselves for the Switching Costs of moving away from Boeing. They will probably have to offer many other incentives as well, such as large amounts of free pilot training. The problem for airlines is that they do not have the Switching Cost protection which assists aircraft manufacturers in retaining their customer base. An airline may be getting a worthwhile amount of business from a major customer as a result of having a corporate deal with them. It will be a simple task, though, for another carrier to come along and offer the customer a more attractive level of discount, with the result that the corporate deal with the first airline is

cancelled and transferred to the second. This will be easy, because little capital investment or training is required to work with one airline rather than with another.

Of course, the first airline will hope that its Frequent Flyer Programme will be of some value in fending off predatory attacks by its rivals, in that many people who actually travel for the firm in question will wish to continue to build their mileage balance, and retain their privileged status, within the programme. Even this, very limited, Switching Cost protection can be addressed by the predator by a 'Golden Hello' tactic of giving out a large number of free miles and Gold Cards in their programme to these people.

Overall, the question of the Power of their Customers is a very difficult one for airlines to address, and goes a long way towards explaining the poor profit performance of many carriers in recent years.

Power of Suppliers

Porter argues – again, the point is straightforward – that when a firm is totally dependent on monopoly suppliers of crucially-needed resources, these suppliers will be able to charge prices which ensure handsome profits for themselves, but which severely limit profits of the firms that they supply. For airlines, the list of suppliers who either actually or potentially have this monopoly power is a depressingly long one. Most obviously, suppliers of Air Traffic Control and airport services may have it, with many airlines having no choice but to pay whatever ATC and airport charges are levied on them. It is most noticeable that at the time of writing airline profits have been severely affected in a major industry downturn, but the pain of this is not being evenly distributed across the industry. Many airports are continuing to show strong financial returns, reflecting the monopoly power that many of them have. Often, it has been necessary to regulate landing fees in order to control the use of this power.

Sometimes, airlines' fleet planning can be affected by powerful supplier issues. The Boeing 747 was introduced into airline service in 1970, and was unchallenged by any other aircraft for the next 25 years. If a carrier's requirement was a long-range aircraft with 400+ seats, the 747 was the only option available to them. Not surprisingly, the aircraft became a very profitable project for Boeing. In the future, a similar situation may develop with the 555 seat Airbus A380, though Boeing's recent decision to launch a stretched version of the 747 – the so-called 747-8 – will have been greeted with a sigh of relief by many airlines.

Perhaps the best, and most controversial, example of powerful suppliers in the aviation industry has concerned the so-called Global Distribution Systems (GDSs).Since their inception in the late 1980s, the GDSs have provided the switching technology which allows travel agents to make reservations with hundreds of different airlines, hotels, car rental companies and tour operators through a single computer keyboard.

Unlike airlines, the GDS business is one of immense scale economies. The capital costs of entering the business have been very high, but running costs have been low. Large firms have therefore been able to spread their capital costs over greater volumes of output and achieve lower

unit costs. As a result, there are only four significant players in the global GDS industry – the US based SABRE and Worldspan, and European-originating Galileo International and Amadeus. (In December 2006, a plan was announced for a merger between Galileo and Worldspan). All were first set up by airlines or consortia of airlines, though in recent years their ownership has become more diverse. (Very recently, some new entrants, using a different business model, have appeared in the GDS industry. This is a development which we will cover fully in Section 7:3)

Besides strongly concentrated patterns of ownership, the GDS industry has also shown a trend towards the establishment of geographical monopolies. For example, a high proportion of travel agents in the UK use Galileo. An equally high proportion in France and Germany are Amadeus customers.

The GDS companies do not, of course, provide their services free. When they were first proposed, the plan was that the costs associated with them would be shared equally between travel agents and airlines. Travel agents would pay substantial rent to the company which supplied them with a GDS service, reflecting the fact that the GDS allowed them to substantially increase the productivity of their staff. Airlines and other travel firms would pay their contribution to GDS costs through a booking fee payable on each booking made in their reservation systems.It has not worked out in this way. Because of the Economies of Scale involved, the GDS companies saw it as a major business objective to increase their market share in order to boost transaction volume. They did so by engaging in aggressive pricing, so aggressive in many cases that travel agents were given a GDS service free-of-charge if they switched from one firm to another, or even received incentive payments for doing so.

The result of such a policy has been that the costs of GDS fell disproportionately on airlines, with the current level of booking fee they are paying being between $4 and $4.50 per passenger. This may seem a trivial amount, until it is multiplied by the hundreds of millions of passengers carried by the world's airlines each year.

Not surprisingly, such a situation has been regarded as totally unsatisfactory by many airlines, particularly by those which have not benefited by having a shareholding in a GDS. Until recently, though, it has been difficult for many of them to do much about it. Some carriers, such as the UK firm Easy jet, have from the beginning adopted a radical policy of direct selling, completely by-passing the travel agency distribution system. Besides avoiding commission payments, this policy has also allowed the airline to save on GDS booking fees. This has been something of great importance to a low fares airline given that booking fees are levied on each booking made and thus potentially make up a disproportionate amount of cost for such an airline.

For traditional carriers, the travel agency system has overwhelmingly been their main channel of distribution, with 85 – 90% of their bookings coming from this source. They have not, therefore, been able to refuse to pay GDS booking fees. Had they done so, the GDS firms would simply have removed the schedules and fares information of the recalcitrant airlines from their database, with the result that almost all the bookings they might have received from travel agents would have been lost. Therefore, in Porter terms, the GDS companies were monopoly suppliers of vital resources, and it should have come as no surprise that during the 1990s they were highly

profitable. It should equally be of no surprise that as soon as the Internet offered a viable alternative distribution channel, airlines would embrace it enthusiastically.

STRATEGIC FAMILIES

Cost Leadership, Differentiation and Focus – The Principles

The diagram is not above criticism. In particular, it suffers from the weakness inherent in any two-by-two format, of attempting to place things in discrete boxes when more normally, relationships are ones of continuum or spectrum. Also, as Porter has recognized in his subsequent writing, a corporate entity may be represented in more than one box as a business becomes larger and more diversified. Finally, in the airline industry, for many years the model failed to work well because government regulation of competition distorted the free interplay of market forces.

Despite these limitations, the model is now a very powerful one in understanding the strategic options open to firms in today's airline industry. In particular, as the forces of deregulation and liberalization have advanced over the last fifteen years, so the model has fitted the circumstances of the industry better and better. In order to make use of the model, it is first of all necessary to understand the meaning of the terms contained in it.

A Cost Leader firm has a set of clear requirements it must satisfy if it is to be successful. Firstly, it must achieve, and then sustain, significantly lower operating costs than its rivals. If it loses its cost advantage, it will be in serious difficulties. Secondly and crucially, it must correctly identify what its customers are prepared to give up, and what they are not prepared to give up, in order to gain access to cheap prices.There are many examples of firms which do successfully achieve these requirements. Interestingly, (in terms of traditional thinking in the airline industry), such firms are often highly profitable, despite the low prices which they charge.

Cost Leadership in the Airline Industry: Background

The concept of Cost Leadership strategies is by no means new in the airline industry. In 1971, a new carrier, Southwest Airlines, was set up (after a series of drawn out legal battles instigated by incumbent carriers), to serve the intra-state Texan market in the USA. The airline became profitable in 1975, and, remarkably, has stayed profitable ever since. It has remained in the black even during the recessionary periods of 1991-94 and from 2000 until 2005, when the losses made by almost all the other airlines in the USA were very large indeed.

It has been the period since the late 1990s that has seen the rapid spread of the use of Cost Leadership strategies around the world. We now have two large, and rapidly growing airlines employing it in Europe,

Ryanair and Easyjet, as well as many smaller new entrants. A new airline, Jetblue Airways, has appeared in the USA, and has made a successful beginning. This has been no mean feat considering the sea of red ink which engulfed the US airline industry during its early years.

Other examples of new entrant Cost Leader players around the world include Westjet in Canada, Virgin Blue in Australia, Gol in Brazil and Air Asia, a domestic and regional carrier in Malaysia.

Besides these existing players, a high proportion of the start-up proposals being put forward at the present time include Cost Leadership elements in them.It is instructive to ask the question why recent times have seen this explosion in the use of Cost Leadership strategies, when the success of the pioneer, Southwest, had been obvious for many years.

Regulatory liberalisation is one obvious explanation. The agreement for the setting up of the Single Aviation Market of the European Union in 1993 (and the subsequent completion of the liberalisation process in 1997) gave opportunities for new entry which never existed before. Liberalisation of other domestic markets – notably those of Canada and Australia – has also been helpful in allowing start-up entrepreneurs to fulfill their ambitions. It is notable that those markets which have so far seen the least development of Cost Leadership – for example South East Asia – are also still amongst the most regulated.

The arrival of the Internet as a channel for airline distribution has also been highly significant. Until the late 1990s, distribution was both challenging and costly for airlines, which were mostly forced to rely on one channel of distribution, that provided by the travel agency industry.

The Internet has changed this situation beyond all recognition. For carriers that have been prepared to break with the past and simplify their fares and reservations procedures, the Internet has provided a route to speedy and cost-effective distribution. In using it, airlines have been further helped by the introduction of electronic, rather than paper, ticketing.

The changing nature of the business air travel market provides a final and interesting explanation for the growth of Cost Leadership strategies. Until the late 1990s, traditional carriers were greatly favored by the fact that business travellers generally paid high prices for expensive, but prestigious travel in Business Class on board airlines which dedicated a great deal of effort to meeting a range of needs centered around prestige and status.

Some of them are still prepared to do this, but a number of changes have now taken place. Recent years have seen an increase in the importance of the so-called “Independent” business traveller. These are people who work for themselves or for small firms, and who feel that the price of an air ticket comes out of their own pocket. Even in the corporate travel market, business travellers are being forced to become more price-sensitive by the corporate purchasing of business travel, whereby companies trade lower fares for loyalty. Even travel agents now join in the quest for lower fares as they seek to prove their ability to get value-for-money, in order to retain their increasingly demanding corporate clients.

Whatever the explanation, the interest being shown around the world in Cost Leadership strategies now makes this the most important strategic development in the industry for many years.

Fundamentals of the Business Model

The business principles that underlie Cost Leadership need hold no terrors for the analyst. They are now very well understood, and remarkably straightforward.Coming to the airline business, the example of so-called Integrated Carriers is instructive. We will cover these firms in detail in the upcoming section, but for the moment what it is important to note is that before their arrival, using air freight for a small urgent package was a complex task, only accessible to experts. Traditional airlines were only interested in the relatively easy job of moving shipments from airport to airport. This left the shipper to make arrangements for collection and delivery, documentation (in itself no mean task in view of the complexities inherent in the documentation requirements dreamed up by airlines) and customs clearance. The result was that large firms called air freight forwarders grew up to handle air freight shipments, because lay people could not undertake the task themselves. Over the years, forwarders have cost airlines immense sums in commissions and in the consequences of reduced market control.

The situation today for the non-expert who has a small package needing air transportation is very different. Integrated carriers – for example, DHL, FedEx, UPS and TNT – all offer a collection and delivery service. They have simplified documentation, so that non-expert people can easily complete it, and arrange customs clearance. For added peace-of-mind, they also have a comprehensive tracking and tracing service available over the Internet.

The result has been exactly as one would expect. The market for small, urgent packages – the so-called “Express” market – is the fastest growing part of the air freight market. The growth, though, is not benefiting the traditional airlines very much with the complicated demands which they place on the customer. Rather, the market share of the Integrators is steadily increasing, allowing them to further reduce their prices as they benefit from the substantial economies-of-scale inherent in small package operations.

If we turn now to the strategies of traditional airlines on the passenger side, the importance of simplicity – or, rather, the lack of it – becomes clearer still. This is best illustrated in the area of pricing policy. To the passenger, the question “What will the fare be?” for a given journey on a given day, seems to be completely straightforward, but airlines have been incapable of giving a straightforward answer. Often, fifty or more fares are available on a given route. Which one the passenger will actually be able to use will depend on their ability to satisfy a range of conditions around such things as advanced booking, length of stay and cancellation/rebooking opportunities.

The consequences of such complexities are severe. They make the training of new reservations and ticketing personnel a costly and time-consuming process. Even more so, the point-of-sale task becomes a slow and complex one. This in turn often forces the consumer to turn to a travel agent to unravel the complexities, involving airlines in the same commission and market control issues which have arisen on the freight side with air freight forwarders. In turn, the build-up of business obtained over the Internet has been much slower for traditional airlines than it has been for new entrant Cost Leader players with their simple fare structures.

Overall, achieving and sustaining simplicity in business processes is an absolutely fundamental requirement for a successful Cost Leadership strategy. Bearing this point in mind, let us now explore further features of the strategy:

1. Low Fleet Costs

Most successful Cost Leader airlines today are pursuing a so-called "Fleet Commonality" policy, having only one type of aircraft in their fleet. In turn, for many, this one type is the various members of the Boeing 737 family. Whatever this aircraft may now lack (at least according to Airbus) in passenger appeal and the use of the latest technology, it has rugged and proven reliability as its greatest asset. These are exactly the qualities needed by a Cost Leader airline, and both Southwest Airlines (with a fleet now consisting of more that 400 737s) and Ryanair illustrate very well a commonality policy with 737s. By sticking to one type of aircraft, they are gaining substantial economies in such areas as pilot training and maintenance.

Other Cost Leader airlines are pursuing different fleet strategies, but still with the aim of securing low costs. Easyjet began as a 737 operator, but in 2002 signed a very large deal for the acquisition of A319s, a smaller version of the A320. One must assume that the deal offered by Airbus was so attractive that it led the airline's management to conclude that lower acquisition costs would outweigh the costs associated with a mixed fleet. The airline will also be in a good position to play one manufacturer off against the other when it comes to the question of new aircraft acquisitions in the future.

2. Low Landing Fees

The previous section showed that the key to successful Cost Leadership was for a firm to establish and sustain a cost and through that, pricing advantage over all its rivals. In order to do so, it must address the "big ticket" cost items, those which will have a substantial impact on unit costs. The benefits of using underutilized airports are very great. The airline gains from very low landing fees, as airport operators reason that they are better off having substantial numbers of passengers (who will, in turn, provide commercial income for the airport from such activities as car parking and shopping) rather than none at all. It will also be able to expand rapidly, free of the slot-availability constraints that bedevil congested hubs.

Interestingly, at the present time, not all Cost Leader airlines are sticking to the "pure" form of the model with respect to airport selection. In strong contrast to Southwest, Jetblue Airways has based itself at Kennedy Airport In New York. Easyjet is making use of some congested European airports – notably Gatwick, Schiphol and both Orly and CDG airports at Paris, though the airline has shown itself to be particularly adept at moving quickly when slots at such airports have unexpectedly become available.

3. Short Turnarounds/High Aircraft Utilization

Once uncongested airports have been selected, the Cost Leader airline is well on the way to achieving its next requirement, that of short turnarounds and high aircraft utilization. Southwest Airlines has always scheduled turnarounds of 20-25 minutes, in contrast to the 50 minutes to one

hour which the industry has traditionally used. This greatly helps the airline in its aim of achieving low costs, because it allows additional rotations to be operated each day. In turn, this permits a wider spread of capital costs (in the case of aircraft which are owned), or of lease rentals.

Of course, short turnarounds are not the only requirements. These turnarounds must be engineered so that they can be achieved consistently – otherwise an unacceptable punctuality penalty will result. Thus, for example, most Cost Leader airlines do not use air bridges at airports, despite the fact that this leaves their passengers unprotected in wet or cold weather. The benefit of this is that it allows both the front and rear aircraft exits to be used, speeding passenger enplaning and deplaning. Controversially, many Cost Leader airlines do not pre-allocate seats. This leads to jibes about "Cattle Truck Handling" as passengers rush for the seats they want when the boarding process begins. It means, though, that passengers are far more likely to be at the gate at the boarding time, and that they can be encouraged to sit down by the cabin crew in any available seat once they are on the aircraft.

As a further point, the fact that Cost Leader airlines are generally "no frills" (see below) makes galley servicing a very easy and quick process, as is cabin cleaning. Indeed, many Cost Leader airlines require their cabin crews to clean the aircraft during daytime stops, with a thorough clean only being given overnight. This will not be possible for full service airlines where food and other debris will be more of a problem (and trade union resistance highly likely).

4. Limited On-board Service

A short-haul airline, British Midland, spends 3.8% of its costs on "Passenger Services" – the meals and drinks given away free to passengers.

It might at first sight be assumed that Passenger Service costs would only be high for long-haul airlines, where passengers need to be offered generous hospitality because of the length of time they are on board the aircraft. This is not so. Traditional short-haul airlines (especially in Europe) have given passengers a complementary drinks and meal service, even on flights with a duration of only an hour or so. The costs of doing so can then only be spread over a small number of passenger-kilometers, and therefore have a disproportionate impact on unit costs.

Cost Leader airlines have a choice to make with respect to on-board catering. Some have chosen to be completely "no-frills". This allows cheaper aircraft acquisition costs due to the absence of galley space, speeds aircraft cleaning and allows extra seating. Others – in fact, today, most of them – do offer a meals-and-drinks service, but charge relatively high prices to what are captive customers. Passenger service then becomes a worthwhile source of so-called 'Ancillary' revenue rather than a cost item.

5. Point-to-Point Only

One of the most important, but more overlooked, reasons explaining the recent success of the Cost Leader model is that airlines using it have concentrated on point-to-point traffic, eliminating

what has hitherto been an unacceptable level of cross-subsidy from point-to-point to connecting passengers.

Any airline offering a transfer and connections product at a hub will incur substantial additional costs. Passengers checking in for a connecting flight will expect to be given a boarding pass not only for their first sector, into the hub, but also for their onward flight. Providing such a service will involve the airline in significant investment in its data processing and communications capability. Passengers will also assume that they can check-in their baggage at their point-of-origin, and reclaim it only at their final destination. All interim baggage handling will be taken care of by the airline, at a substantial cost. Once they reach their hub airport, they will expect to wait for their onward flight in a comfortable and well-appointed lounge.

Important though these costs are, the provision of a connecting product will have still wider – and greater – cost implications. Implicit in the idea of hubbing is that flights will be coordinated in banks, so that connections can be made in the shortest possible time. These banks require a peak availability of resources, resources which will be poorly utilized as soon as the peak is over.

The costs of a connections product would be a severe problem in themselves. The problem is made worse, though, by the low yields often obtainable from transfer traffic. A passenger making a connection will generally have a worthwhile choice available to them, because they will be able to travel via the hubs of a range of different airlines. Carriers know this, and will try to entice the passenger to choose their hub rather than that of a rival. Yields are therefore generally poor in the market of transfer traffic.

In the past, traditional airlines have been able to compensate for these low yields by charging disproportionately high prices to people travelling on a point-to-point basis, for whom the hub serves as a local airport. The result has been that it has commonly been cheaper to fly from a point behind the hub, into the hub and then beyond, than it has been to travel on a point-to-point basis. Such absurd and discriminatory pricing practices have led to so-called Cross-Border Ticketing, an “abuse” which airlines have repeatedly tried and failed to eliminate.

Cost Leader airlines have removed all the costs and revenue dilution associated with a transfer product by concentrating exclusively on point-to-point traffic. It is, of course, possible to transfer form one flight to another on these airlines, though the fact that the emphasis is placed on high aircraft utilization rather than the scheduling of banks of flights makes connecting opportunities less likely. Nothing is done, though, to assist the connecting passenger. When they reach their transfer airport, they will have to reclaim their own bag, and take it to the check-in desk for their onward flight themselves. No luxurious lounges are, of course, provided. With fares and yields, there is no dilution, because the airlines follow a “Sum-of-sector Fares” pricing principle, rather than the complex “Pro-rating” procedures we will describe in section 6:2:1.

6. Simple Fares

Cost Leader airlines follow significantly different pricing practices from traditional airlines in other ways as well. As we saw earlier in this section, the disciplines of Revenue Management

have led airlines in the direction of greater pricing complexity, with often fifty or more fares being on offer on a particular route, most of them having different, and confusing, conditions associated with them.

Cost Leader airlines do make use of Revenue Management techniques, but generally with one crucial difference compared to traditional carriers. When someone looks at the website of one of these airlines, at the time they do so there is only one fare on offer for the flight in which they are interested. They are therefore faced with a clear "take it or leave it" choice. The fare on offer will certainly vary through time, being generally low well in advance of flight departure and rising as the departure day nears. The fact that there is only ever one fare available at a particular time makes the whole reservations procedure a very simple one, and, as we move onto now, allows the internet to be the cornerstone of distribution.

7. Low Distribution Costs

We will see there that the 1990s saw a rapid and unacceptable increase in the distribution costs of traditional airlines. This was due to the overwhelming domination of one channel of distribution − that provided by the travel agency industry. This near-monopoly caused a rapid increase in the commissions being paid to travel agents, as well as seeing airlines very vulnerable to the pricing practices of the Global Distribution Systems.

Any airline seeking a Cost Leadership position must address the question of distribution costs. If it can eliminate travel agents' commissions, a major step will have been taken towards the establishment and maintenance of a cost advantage, especially when it is born in mind that by the end of the 1990s it was common to find that 12% - 14% of a traditional airline's costs were made up of commissions.

In some sense, the elimination of GDS booking fees has been even more important for Cost Leader airlines. The GDS companies have always charged on a flat rate basis, currently about $4.50 per booking made. This is a reasonable policy given the structure of their costs, but it means that booking fees fall disproportionately on low fares carriers. $4.50 on a Business Class return fare of $3000 is an irrelevance. The same booking fee on a $50 fare most certainly is not.

The answer to the distribution problem for Cost Leader airlines has, of course, been to use the Internet. In this regard, the UK airline Easyjet has been the pioneer. From its foundation in 1995, Easyjet has paid no commission to any travel agent, and, because of this, no booking fees to any GDS company. The cost savings it has achieved as a result have been immense.

Easyjet has been followed by the airlines set up before it – Southwest and Ryanair – which have progressively eliminated the use of travel agents, and now have almost as high a proportion of their seats sold direct as Easyjet. Later entrants into the market have almost totally relied on internet-based direct sales.

8. Non-Refundable Tickets

In the past, most airlines have had a policy of making their more expensive tickets fully refundable. This makes them very much more attractive, especially for the business traveller whose exact schedule cannot be predicted very far in advance. It means, though, that these airlines have always had a significant no-show problem, which they have resolved, to a degree, by overbooking. All the Cost Leader airlines have a policy of allowing no refunds. Bookings can be changed, in return for a substantial fee (in the UK, generally £25 plus any difference between the fare already paid and the current fare available on the flight to which the booking is to be transferred) but no money is ever refunded. This allows the airlines a better and more certain cash flow, which in turn brings useful savings in interest costs.

Cost Leader Airlines: Current Issues

We have now looked at the different policies which airlines in the Cost Leader sector pursue. They illustrate perfectly Porter's principles of Cost Leadership set out in Section 4:2:2. Successful players have to establish and sustain a cost, and through that, pricing advantage over their rivals. They must also correctly identify what their customers will, and will not give up to gain access to cheap prices. Cost Leader airlines have discovered that their customers will give up, amongst other things, service from their ideal airport, complementary meals and drinks, seat selection, the opportunity to buy a ticket through a travel agent and ticket refunds.The consequences of such policies, if correctly applied, are remarkable.

Cost Leader airlines seem to be the ones which have found a way round the chronic airline industry problem of cyclicality. As the business model of Differentiation in the airline industry has generally allowed carriers to make reasonable returns in the buoyant upswing periods of the Trade Cycle. It has left them hopelessly exposed, though, in slow-down and recessionary times when large parts of the high yielding Business Class market – on which these airlines depend – has evaporated.

The Cost Leadership position, though, addresses such issues through what appears to be a virtuous circle. Low costs allow for profitable lower prices, which in turn substantially increase the size of the market. In times when the economy is strong, this market growth comes from new passengers being brought into the market who would not otherwise have flown. In times of slowdown or recession, Cost Leader airlines also appear to gain as people who are still anxious to fly trade down from the full service airlines as they seek lower prices.

A controversy currently affecting the Cost Leader sector is the question of the importance of customer service standards. The Cost Leader pioneer, Southwest, is a remarkable airline in that despite the fact that it is now a very large and mature carrier, it has retained a high degree of popularity with its passengers. The Department of Transportation in the USA collects, and publishes, data about passenger complaints, with the Major carriers being compared on the basis of the numbers of complaints received per 100,000 passengers carried. Southwest has been the airline with the lowest number of complaints for more than ten years, despite its "no frills" service. The secret seems to be that the airline makes a limited promise but keeps it consistently. It has also made great play on a warm and friendly style of service, and a solid approach to customer service if things go wrong.

Amongst the other Cost Leader players, a different approach is apparent. Ryanair in particular, if media reports are to be believed, takes the view that customer service on the rare occasions when things go wrong is less important. Providing fares are cheap enough, people will mostly keep coming back. Those who desert the airline after experiencing a severe service failure will soon be replaced by new people brought into the market by the airline's very low prices. It will be interesting to see which of these philosophies turns out to be the correct one in the long term.

Another major issue in Cost Leadership at the moment concerns the best way for a Cost Leader airline to be set up. Today, the successful Cost Leader players are all independent, in that they have been put together entrepreneurially, without links with any pre-existing airline. Given the profits that they have enjoyed in recent years, and the threat that they pose to longer-established airlines, it is not at all surprising that these "Legacy" airlines have adopted the philosophy that, "If you can't beat them, join them". A common way for a Cost Leader airline to be set up has been as a subsidiary of a full service carrier.

So far, little success has attended these efforts. During the 1990s, three of the US majors, United, Delta and USAirways set up low fares subsidiaries, using the branding of Shuttle-by-United, Delta Express and Metroair respectively. Within 4 years, each of these airlines had been closed down. In 1995, British Airways set up a Cost Leader subsidiary called Go. Presumably, the airline did not regard this carrier as a success, because it was eventually sold off (to its management, who then sold it to Easyjet), at what seems now to have been a very low price.

In recent years, there has been renewed interest in the idea of full-service airlines setting up low fares subsidiaries in order to try to compete with independent Cost Leader players. For example, Air Canada established two subsidiaries, using the sub-branding of Tango and Zip, to compete, presumably, with the very successful and rapidly-growing Westjet. Delta Airlines carried out a second attempt to enter the Cost Leader business with a new subsidiary branded Song. In Europe, British Midland set up BMI Baby, and SAS announced a Scandinavian no-frills airline under the Snowflake branding. In Australia, Qantas has set up its Jetstar operation, which at the time of writing seems to be faring quite well.

Some of these new initiatives may indeed be successful, but it is impossible to be optimistic. Air Canada has already closed down its Tango subsidiary, and Delta is merging its Song subsidiary back into its mainline activities. The essence of Cost Leadership is that firms are able to establish and sustain a cost advantage over their rivals. With low fares subsidiaries of full service (and highly unionized) airlines, concessions may be given in a time of crisis which allow a lower cost base to be established. However, once things begin to improve, it often becomes a major objective of union negotiators to ensure that wages, salaries and conditions of employment at the subsidiary start to move nearer to those which prevail in the mainline operation. The cost advantages are then progressively eroded. Also, the setting up of a low fares subsidiary involves significant branding problems. When someone experiences no-frills service on a low-cost subsidiary it may color their view of what will happen on their next flight with the full-service parent. Finally, low fares subsidiaries will perhaps allow an airline to compete more successfully with Cost Leader players which are challenging its dominance. Another, less desirable, effect is

that the subsidiary may take traffic away from its parent, and lead to criticism of the parent's relatively high prices.

"Differentiation" in the Airline Industry

Large numbers of airlines – mainly those which are long-established – in today's airline industry do not seek out a Cost Leadership position for their mainline activity (though, as we have seen, increasing numbers of them have set up Cost Leader subsidiaries). Instead, their argument is that they provide a value-for-money solution to a wide range of customer requirements, exploiting the synergies which become available to a firm producing a range of different products under the same umbrella. Such policies conform very well to the "Differentiation" position of the Porter model.

In recent years, many airlines in the Differentiation sector have suffering chronic financial losses. This has been especially so amongst the airlines of the United States, and to a lesser extent, Europe. Indeed, in many cases, the term "Legacy Airline" is a good description of these carriers, as they have often seemed to be dinosaurs finding life difficult or impossible in a fast-changing world.

This dire situation has, though, only arisen relatively recently. Whilst financial returns in the Differentiation sector have never been good, the period from about 1996 until 1999 was as prosperous a time as many of them had enjoyed in their entire history. Indeed, at the time it did seem that a business model was becoming established which would allow, at long last, a sound and consistent return for shareholders. We need, firstly, to define this model, and then to come onto the difficult and painful question as to why, in a comparatively short time, it was so disastrously undermined.

In order to be successful in the Differentiation sector it has always been necessary for airlines to be innovative. Indeed it is not co-incidence that two of the most successful airlines in this sector, Emirates and Singapore Airlines, are also the airlines with a strong reputation for innovation. Both are early customers for the Airbus A380 large aircraft, and both have consistently aimed to be at the forefront of new developments in such areas as cabin comfort, in-flight service and in-flight entertainment.

Of course, over time, almost all innovations are capable of being matched by competitors and most of them are. However, Emirates and Singapore Airlines illustrate the concept of so-called "First Mover Advantage", in that they have continued to reap the benefits of innovation even after matching by competitors has taken place. It seems that consumers continue to think well of a pioneer that took the risks and made the investment in an innovation which improves their lot.

Despite the importance of a product which matches the state-of-the-art, the standards of personal service which are offered assume even more significance for a Differentiation airline. The business travel market – of crucial importance to Differentiation players– consists of a relatively small number of people, many of whom travel frequently over a long period of time. They get to

know the airlines that give them a warm and caring welcome, and those which do not. Naturally, they prefer to travel, all other things being equal, with carriers which treat them well.

Personal service standards assume an even greater importance because they can provide a Sustainable Competitive Advantage. An airline may find that its standards of seating comfort, for example, have fallen behind those available on it rivals. If it does, it is then a straightforward, albeit costly, task to order and install the new seats which will correct the anomaly. Things are not so straightforward if it has customer-contact staff who are ill-disciplined, poorly motivated and incompetent. Correcting such a state of affairs may take concerted action on many fronts over a long period of time. During this time, the airline will be losing out to its rivals if these competitors do not have the same problems.

Brand building forms another, vital, part of the business model for successful Differentiation in the airline industry. For the moment, though, it is worthwhile to note that for many airlines, their problem is that they have become commoditized. Passengers tend to feel that all airlines are the same and that there are no strong reasons for choosing one rather than another. A small number of airlines do, though, manage to rise above such generalizations, and to achieve valuable status as a brand. The British carrier Virgin Atlantic is an example, in addition to Emirates and Singapore Airlines.

A further aspect of the traditional business model for Differentiation carriers is that they need to be well-represented in each of the major market segments, those of business travel, leisure travel and air freight. Such a policy will bring with it the major disadvantage that the airline will be setting itself a complex management task, in which contradictions and compromises will be a major feature. However, the synergies available to the multi-product airline will often more than compensate. A presence in the business travel market will give an airline access to the highest yields, whilst the leisure market is the one which is producing the highest growth rates. Also, almost by definition, the business and leisure markets have complementary demand patterns, as when business travellers aren't travelling because it is a holiday season, there will be a peak in leisure travel.

The synergies available from a strong presence in the air freight market are perhaps even greater. Belly-hold space in passenger aircraft will be cheaply available, and will also allow freight customers to benefit from the frequency and wide route network essentially provided for passengers. Air freight will help airlines' cash flow during the times when passenger demand is affected by wars or a terrorism threat. Also, there is some evidence that air freight helps airlines respond to the challenges of the trade cycle, in that it tends to be affected by a recession earlier, but to come out of it sooner, than the passenger side of the business. It is not co-incidental that both Singapore Airlines and Emirates earn about a quarter of all their revenue from air freight.Points about the importance of innovation, customer service, brand-building and a synergistic presence in all the major market segments have always been true and remain so today. The other major issue with regard to the business model for Differentiation airlines is more controversial.

Airline Alliances

Alliance relationships now have a long, and chequered, history in the industry. Throughout the history of commercial air transport, carriers have often preferred the comfort of co-operative rather than competitive relationships, but the modern alliance movement can be dated to 1993. Then, KLM and Northwest Airlines announced their wish to set up a strategic partnership. They were able to move ahead once the United States government gave them immunity from the US Anti-Trust laws, which it did following the signing of an "Open Skies" agreement between the US and Netherlands government, a development which we have discussed in Section 3:2:2.

The KLM/Northwest move was followed in 1995 by Lufthansa and United Airlines proposing what has become the Star Alliance. Again, anti-trust immunity was available once the German government had agreed to a US-style Open Skies Agreement. The Star Alliance grew rapidly in terms of the number of members it had, with it currently consisting of 19 member airlines.

A year later, the formation of the OneWorld alliance by British Airways, American Airlines and Cathay Pacific was announced. Although OneWorld has certainly developed since then, its activities have been hampered by the fact that American and British Airways do not have anti-trust immunity due to a long-running and bitter dispute about aviation policy between the US and British governments. This in turn means that co-operative discussions with OneWorld have always had to stop short of subjects of commercial intimacy such as fares and schedules co-ordination.

The evolution of the modern alliance scene was completed in 1999 when Air France and Delta Airlines formed the Skyteam alliance. Skyteam initially followed a different policy from Star, in that limited itself to a smaller, but, arguably, more manageable number of members. Now, though, attempts are being made to bring Continental and Northwest Airlines into the alliance, with bitter battles being fought to win what is seen as being the necessary anti-trust immunity. It now seems that we are reaching a mature airline alliance scene consisting of three global alliances, Star, OneWorld and Skyteam. There does not seem to be room for a fourth.

There is one final element of the current alliance scene which should not be overlooked. Some airlines have not joined any of the global alliances. Virgin Atlantic and Emirates are both examples. Emirates, in particular, has taken a strong position of preferring to maintain its independence rather than become enmeshed in what the airline's chief executive has called the straitjacket of membership of a single alliance.

Overall, it is clear that the formation and growth of alliances has been a central theme of the airline industry over the last decade. It is not hard to see why. A combination of theory and practice shows that, potentially, alliances can bring their members significant benefits to their bottom line. We will look first at these benefits, before considering the – often overwhelming – problems of alliance relationships.Theoretical principles show us that the benefits of greater size – which airline alliances are essentially aiming to tap into – can be divided into two: Economies of Scale, which consist of cost reductions achieved through size, and Economies of Scope, which reflect the revenue benefits of co-operation, normally brought about by increased marketing muscle-power.

In investigating each of these areas in today's aviation industry, we are immediately faced with the difficult question of "What is an alliance?" The word is used very loosely. It can mean anything from the most distant and loose of code-shares to a situation which is as near a merger as the present ownership and control rules allow. It also may, or may not, involve the partners in minority equity stakes.

Having said this, it is clear that airlines which enter into co-operative alliance relationships are seeking cost reductions as a result of doing so. They may engage in joint purchasing activity (though, as we shall see shortly, this is often easier said than done). A common expedient is co-operation in ground handling. If alliance partners can negotiate together, this may increase their bargaining power with the often-intransigent suppliers of airport services. Sometimes, airlines have attempted to save money by an agreement to give up being self-handling at out-stations, leaving such activity to their alliance partners. In turn, they will handle the partners at their own home base. Finally, sometimes, airlines will agree to save money by combining their sales teams, although history says that such agreements are normally only of short duration. They usually fail as soon as one of the partners finds that its revenue is falling as a result of the fact that it is no longer represented by a sales force solely motivated to promote its services.

Each of these possible areas has the potential to be important, but they are often overshadowed by the cost advantages of Code-Sharing. Code-sharing activity between airlines can be divided into two types: that designed to cement traffic feed, and that which, however it is presented, is actually meant to reduce the intensity of competition on a route.

Code-sharing to control feed is, mostly, a legitimate activity from the consumer viewpoint. Two or more airlines may agree to share their codes, so that their connections will appear as on-line in the GDS displays. Ideally, they will then co-ordinate their activities to provide, as far as possible, genuinely seamless connections for each others' passengers. All airlines will then benefit. In particular, long-haul airlines will gain feed from short-haul markets. It may not be possible for them to fly these short-haul routes themselves, because of ownership and control rules. Even if they can, it will often make more sense to rely on a specialist short-haul airline, with a more appropriate cost structure, to do so.

Code-sharing to reduce the intensity of competition is, inevitably, much more controversial, carrying, as it does, connotations of collusion between supposed market competitors. Such activity has a long history in the airline industry. Prior to the development of Code-Sharing in the late 1980s, airlines commonly formed "Pooling Agreements" whereby all the revenue on a route was put into a single pot and divided up at the end of each year according to a pre-agreed formula. Modern Code-Sharing agreements, in their extreme form, are little different. All the flights on a route carry the codes of both the "competitors" and are jointly marketed by both the airlines.

It is certainly possible to argue that such arrangements bring benefits to the consumer. The airlines are able to engage in co-operative rather than competitive scheduling, giving the passenger a better spread of flights throughout the day. Also, larger aircraft may be employed, giving lower seat-mile costs and the promise of lower fares. Nonetheless, these benefits must be

offset against the lower intensity of competition on a route. Generally, the consumer interest is best safeguarded by competition, rather than collusion. We will return to this point shortly.

The question of alliance co-operation strengthening airline Frequent Flyer Programmes is a more telling one. Indeed, it can be suggested that in many senses this is the glue which has held the alliances together through all the difficulties that they have experienced – to be discussed shortly. When an airline joins an alliance, it normally agrees to offer the benefits of its FFP to the programme members of all the other carriers. Thus, for example, if someone has a Gold Card issued by one of the other airlines, the new member airline will allow them to use its airport lounges. Reciprocal benefits will also be on offer to its own members. Even more importantly, alliances are able to offer the benefit of "Earn-and-Burn" rights. These mean that someone flying on any of the airlines in an alliance can earn miles in the FFP of which they are a member. They can also use these miles to obtain free flights on any alliance airline.

"DIFFERENTIATION" AIRLINES – THE FUTURE

"Legacy Airlines" – Strategic Options

For these airlines, it should be emphasised that their situation is by no means hopeless. They carry with them some very valuable strengths today, and have worthwhile opportunities which will open up for them in the future. For example, the very fact that they are long-established means that they have Grandfather Rights on airport slots which often stretch back many years. They will retain these rights into the future, unless the industry radically changes the methods used for slot allocation, something which, at the time of writing, appears unlikely. Also, and despite the criticisms of hubbing made in the previous section, their hubs do give them opportunities to gather in traffic from a wide geographical area, and provide a worthwhile fortress against new entrants. As we have seen, their Frequent Flyer Programmes are valuable, and pose a difficult competitive issue for smaller newcomers. Also, despite the criticisms made in Section 4:2:6 about airline alliances, one has to concede that to some degree alliance membership should be seen as a strength, particularly when it comes to negotiating with 'common enemy' outside suppliers.

Perhaps of greatest value to these airlines is that they still have a defendable position in long-haul markets. As we have seen, it is much harder for Cost Leader approaches to succeed on long-haul routes, because of the difficulties such airlines have in establishing and sustaining a substantial cost advantage.

Finally, the very fact that "Legacy" airlines are long-established allows them to make the branding claim that they are "proven". A carrier with an unblemished safety record stretching back for many years is likely to be able to persuade the nervous traveller to choose them rather than a new entrant, whose safety promise must be taken on trust. Unfortunately, for British and American airlines, the fact that they may have a proven safety record may not be enough to stave off the perception that they are a possible target for terrorist attack, following on from the Second Gulf War of 2003. and the so-called 'War on Terror'.

Despite these strengths, the Legacy airlines have had to change their strategies. Indeed, those that have not done so have simply gone out of business, or have become dependent on state handouts and protection. The question is, what strategic options have been open to them? Fortunately, there have been a number. No single option has provided all the answers. Carriers have had to select the best parts of each one in order to define an overall strategy.

A first option might be described as a "Retreat to Core" strategy. As we have seen, the Legacy carriers still have a defendable position in long-haul markets. Also, despite the radical nature of the developments which have taken place on short-haul, they have not affected every passenger. There is still a hard core of business people who will pay high prices for a flexible ticket and a seat in a comfortable Business Class, even on short journeys. Has it been possible to retreat to this core of high-yielding and hopefully profitable business? Certainly, at the present time all the Major US airlines are trying to increase the emphasis which they are placing on long-haul international services, while shrinking their involvement in the American domestic market, where competition from Low Cost Carriers is at its most intense.

Strategies of retrenchment are notoriously difficult to implement in the airline industry. They require, to begin with, a complete re-planning of the fleet around smaller aircraft. Those high yielding passengers who constitute the supposed core will normally be business travellers, who will in turn be extremely frequency-sensitive. Airlines will also need to maintain frequency to ensure that there are sufficient numbers of connecting passengers feeding into their long-haul services. Fortunately, there are now suitable aircraft available. The smaller versions of the B737 and Airbus A320 families are well-proven, if less than optimal, aircraft. Embraer is now introducing its 170 and 190 families of new aircraft with around 100 seats.

Although these aircraft have good operating economics, inevitably their seat-kilometre costs are quite high, especially given the generous salaries normally paid to pilots by Legacy carriers. These salaries are, of course, especially punitive when spread over only the hundred seats or so of a small aircraft.

The other major problem of "Retreat to Core" strategies is that they can leave market opportunities open to competitors. The situation in the UK aviation industry illustrates this problem well. Many short-haul destinations have been served from both London's Heathrow and Gatwick Airports. Generally, profitability has been much better on the routes from Heathrow. If an airline is making money by serving a destination from Heathrow, whilst incurring losses on the equivalent route from Gatwick, the solution appears to be obvious. By cutting out the Gatwick service, the profitable core can be identified and overall profitability achieved. Unfortunately, in practice, the situation may not be so simple. Giving up a route may involve the relinquishing of airport slots which under the "Grandfather Rights" rules, can then be awarded to another airline on an "in perpetuity" basis. This airline may then use the slot to sharpen its attack on the rival which gave it up in the first place. This may involve beginning service on the specific route abandoned by the first airline. If the challenger has lower costs and more attractive fares than its competition, traffic may be attracted from the "core" route, turning it from profit into loss-making.

The second strategic option is a very clear one. If "Legacy" airlines find that their position in short-haul markets is being undermined by "Cost Leader" players, it seems the most obvious of initiatives for them to fight back by setting up Cost Leader subsidiaries of their own. The jury is still out on the question as to whether this is a sound strategy or not. So far, the results produced by it have been, at best, mixed. Those airlines which have recently decided to use it will no doubt argue that lessons have been learned, and that we should now be talking about "second generation" Cost Leader subsidiaries which will achieve much better results. In the month before this new edition was completed, both South African Airways and Iberia announced that they were intending to set up new Cost Leader subsidiaries, so the area is certainly still an active one.

It is interesting to note that some airlines have examined and rejected the idea of a Cost Leader subsidiary. Aer Lingus has never set up such an airline, despite being the first European airline to face competition from a Cost Leader player (Ryanair is based in Dublin), and to face it in a particularly severe form. As we have seen, British Airways set up a Cost Leader subsidiary called Go, but sold it in 2001. If the public statements of the present BA Chief Executive are to be believed, they have no plans to re-enter the sector.

All Legacy airlines, whether they have set up a Cost Leader subsidiary or not, have had to follow the third strategic option. They have had to do all they could to reduce their cost base. If they can reduce the often enormous disparity between their costs and those of the newer Cost Leader airlines, they are then in a position to lower their fares themselves. They may also be able to regain some of the passengers who may be unhappy at the sacrifices the Cost Leaders require them to make to gain access to their cheap prices.

Some of these cost reductions have been achieved relatively painlessly. All airlines have undoubtedly leant on their suppliers and demanded concessions from them. In a recession-hit industry, these suppliers have had little choice but to agree, especially if airlines pursue tough policies to reduce the number of their suppliers so that they are able to exercise the maximum amount of buying power over them. Commission costs and GDS booking fees have come down everywhere as airlines have relied on such initiatives as electronic ticketing and selling over the Internet. A growing self-service culture has been encouraged through useful developments as self-service or, more recently, on-line check-in. Finally, some successful attempts have been made to cut out some of the complexities which Legacy airlines have traditionally built into their business model. This has in turn allowed for lower costs as a result of a reduction in overhead expenses.

Important though such initiatives have been, they do not address the key question. As always, has been those airlines that have successfully dealt with the perennial Legacy airline problem of labour costs that are now the best placed to face what is bound to be very rough weather in the future. Labour costs are vital to Legacy airlines because they are the biggest single input cost item for them. Commonly, 30% or more of their costs are made up by wages, salaries and benefits. Addressing labour costs therefore has the greatest single impact on unit costs. Unfortunately, in doing so, airlines have been faced with the fact that their unions are generally in a very powerful bargaining position. The list of work groups who can paralyse an airline

through strike action is a very long one. As service businesses, carriers have no opportunity to build up inventory with customers in advance of a strike. Once it begins, the effect of a strike on cash flow will be immediate. In the case of one work group – pilots – airlines have to deal with people who are generally articulate and intelligent and with a long record of militancy at many carriers. Finally, in the view of this writer at least, airlines have worsened what would in any case be a difficult labour relations environment by their continuing belief that big is better. Too often, people working in large airlines feel isolated and threatened, providing fertile ground for trade union militancy.

In some cases, carriers have resorted to extreme measures to bring down their labour costs. The US Chapter 11 bankruptcy code allows a firm to receive, for a period of time, court protection from its creditors. Several airlines have used time in Chapter 11 to radically change their labour contracts, emerging from bankruptcy with a much lower cost base. USAirways did this in 2002/3. Air Canada used the Canadian equivalent at same time. United Airlines and Delta have done so subsequently. Others have used the possibility of bankruptcy as a threat. American Airlines in March 2003 obtained significant concessions from its normally militant unions by suggesting that a bankruptcy filing would take place if these concessions were not granted. The unions knew, of course, that they would be taken anyway if American had gone in Chapter 11.

More generally, it often proves possible for airlines to lower labour costs in a time of crisis. The threat of bankruptcy, or at least of large job losses, will usually be enough to focus minds. The problem, of course, is that demands will be made for the old conditions of service to be re-instated once happier times return. In the meantime, customer service standards will slip, if the workforce becomes punch-drunk and demoralized.

A further possibility for addressing labour cost issues is to make a proportion of the rewards available depend on company performance through stock options and profit-sharing schemes. Such methods have been used by some of the new entrant Cost Leader airlines, where profits have been good and share prices rising. They are of no relevance, though, to Legacy airlines where share prices have fallen to very low levels and profits are non-existent. In any case, the whole question of employee shareholdings has been discredited by the experience of United, where for a number of years the employees actually owned a majority of the company's shares. This did not turn out to be a recipe for harmonious labour relations– much the reverse. The experiment was finally abandoned in March 2003.

A strategic option which has been followed by many Differentiation airlines has been to subcontract some of their short haul feeder services to airlines with a more appropriate cost structure. As we have seen, service on thinner routes often presents traditional airlines with particular problems. Pilots unions have generally successfully made the case that pilot salaries should be higher for flying bigger aircraft. They do not usually accept the corollary that if an airline introduces smaller planes, salaries should fall. The result is that carriers often end up flying regional jets on the basis of high pilot salaries, making profitability on thin routes impossible.

The answer to this problem is to ensure that the thinner routes are flown by regional airlines with better cost structure, using Code-Sharing and franchising relationships. Though such expedients raise questions about brand integrity, the policy has generally turned out to be a sound one. The large airline gains the benefit of feed onto its long-haul routes without the costs of trying to do the job itself. The smaller carrier also benefits through such aspects as membership of the major carrier's Frequent Flyer Programme.

A last strategic option open to threatened Legacy airlines might be described as "Jugular Marketing". If the position of a long-established airline comes under attack from new entrants, it may respond aggressively. Fares may be cut to the levels of the newcomers, or even below them. Capacity may also be added so that there is a glut of seats in the market. Such a policy will be designed to drive the new entrants out of the market, and also to send a clear message to others to keep away. Lufthansa's policies in Germany towards Low Cost Carriers do, at the time of writing, seem to reflect exactly these principles.

Such tactics now have to be employed with caution. It will depend on the particular legal jurisdiction under which the airline is operating, but they may well be interpreted by the courts as representing an "Abuse of a Dominant Position". None-the-less, the dividing line between what is an abuse and what is a legitimate (and, from the consumer viewpoint, desirable) response to a competitive challenge will always be a fine one. Established airlines cannot be expected to do nothing, nor should they be, as the ground is taken from beneath their feet.

This has been a difficult section of the book, and it will be a relief in the next one to reach happier ground. The facts, though, cannot be avoided. The undermining of the position of many once strong Differentiation airlines has been the major strategic trend in the industry over the past five years. The best managed of these carriers certainly do have a future, but they have had to radically reform their ways of doing business.

"FOCUS" STRATEGIES

"Value Added" Focusing

A very good example of "Value Added" focusing in the airline industry is that of "Integrated Carriers" such as Fedex and UPS. Both these firms are now long-established, and both have modified their basic business strategies in recent years to reflect changing market conditions. They have, though, always had a strong emphasis on a single activity – the provision of guaranteed next-day delivery services for shippers who need to send small, urgent packages.

Such a service cannot be provided cheaply. Indeed, capital investment needs are enormous. Integrators need to invest in very large fleets of freighter aircraft. They generally cannot rely on the services of existing airlines, which, on short-haul routes at least mainly provide capacity in the daytime, in passenger aircraft belly-holds. They also must construct and run costly sortation centres at their hubs, centres which are capable of dealing with millions of packages in a short two-or-three hour window in the middle of the night. Huge investment will be needed in the surface transport vehicles which they will need in order to offer the collection and delivery part

of their service. They will also be involved in heavy spending on Information Technology in order to provide the tracking and tracing options which their customers expect.

Such large capital requirements provide a formidable barrier-to-entry. It now looks likely that UPS and Fedex will be the leading players in the duopoly which has always been likely to be the mature structure of the integrated operations industry. It is possible, though, for those that make the investment to cover their costs and achieve profitability because of the uniqueness of their product and the substantial amount of value that they add. Prior to the arrival of the Integrators, the shipper of a small urgent package was required to solve most of their problems themselves. Traditional airlines were only interested in the undemanding task of moving goods on an airport-to-airport basis. Collection and delivery had to be arranged by the shipper, normally using the services of an air freight forwarder. In addition, it was rarely possible to achieve the late afternoon collection, early next morning delivery ideal because, as we have seen, combination airlines relying on belly-hold capacity had most of their freight space available in the daytime. Little was available at the dead of night, as it would need to be if true overnight delivery was to be available.

Another value-adding Focusing proposition has been tried frequently in the airline industry, but appears to offer a much poorer chance of sustainable profits. This proposition is based on the idea of focussing exclusively on meeting the needs of the business air traveller.

At first sight, the strategy appears to be a promising one. Market surveys amongst higher status business travellers show that they expect such things as high standards of seating comfort and in-flight service from the airlines they choose. Sometimes, though, an additional factor emerges. Business travellers often say that they dislike flying with those on vacation, who may be noisy and disruptive. They say that they would prefer their own airline, where their needs and status can be properly recognized.

Given such apparently fertile ground, there has been a regular supply of start-up airlines focussing purely on the market of high status business travellers. MGMGrand Air was a United States example – it ceased trading in 1995. From 1995 until it closed in 1998, Fair lines was a European equivalent, flying all First Class services from its Paris base.

In October 2005, two new, very interesting, airlines both began flying the route between JFK Airport in New York and London's Stansted Airport. Both have been employing an 'All Business Class' strategy, though there have been substantial differences in the detail of the strategy that each has adopted. The first, Maxjet, has been flying a Boeing 767, with good, but not exceptional, standards of seating comfort – each aircraft has been configured with just over 100 seats. Eos Air, in contrast, is using a single-aisle Boeing 757, but has placed only 48 seats in the aircraft. These offer truly remarkable standards of seating comfort, with each seat folding down into a flat bed, and provision for another seat to be available so that business meetings can be held during the flight.

Despite their popularity with start-up entrepreneurs, no business travel focussed airline has yet stood the test of time This is firstly because the concept is based on a misunderstanding of the

priority of need of the business traveller. Business people certainly appreciate high standards of in-flight service and the benefits in terms of status and exclusivity which having their own airline can give them. Their most important needs, though, are more mundane. They must have a high frequency of conveniently-timed flights over a broad route network. They also appreciate the personal gains available to them (using their employer's money) of a Frequent Flyer Programme. All these needs can be better met by Differentiation airlines, exploiting the synergies available from carrying both business and leisure travellers. Indeed, one of the great problems of business traveller focussed airlines is the question of what they do with their aircraft during holiday periods and over the weekend when the business market falls away.

The second problem with the All Business Class concept is that it is as far away as can be imagined from a niche strategy designed not to provoke a damaging competitive response from stronger and more powerful rivals. Eos Air in particular is targeting well-established rivals – British Airways, Virgin Atlantic, United Airlines and American Airlines, on one of their most important and profitable routes. It is also seeking to take market share away from them in the most important market that they have – high yield passengers in the First and Business Class cabins. In doing so, it is provoking these airlines into a competitive battle that they simply cannot afford to lose. Sadly, a bloody and (for Eos) fatal confrontation looks to be a serious risk.

Of Eos and Maxjet, perhaps one can be more optimistic in the case of Maxjet, and it is possible that this airline will set a new template for a successful 'All Business Class' strategy. Its fares (and unit costs) are much lower than those of Eos, and it appears to be aiming at the much larger market for full economy and 'Premium Economy' passengers (to use Virgin Atlantic's jargon). It may be able to find profitable uses for its aircraft on charter work during slack times for business travel. Finally, by choosing a wide-bodied rather than a narrow-bodied aircraft, they will have air cargo as a potential source of revenue, given that the airline's concentration on business travellers and relatively small number of seats in each aircraft will mean that little belly hold space will be taken up with passenger's baggage. Its prospects will look particularly bright if it can find working relationships with the Low Cost Carriers which dominate short-haul flying out of London's Stansted Airport.

Despite one's reservations about Eos Air, there may be one possible way in which a business traveller Focus may work and that is under the umbrella of a full-service airline. In many senses, the Concorde flights of Air France and British Airways were exactly that, being focussed on the tiny "tip of the pyramid" market. Both airlines continued with them for a long period, so one must assume that a profit was made, though "profit" has a doubtful meaning when the airlines received the aircraft free of charge from their respective governments. The services, were, of course, terminated in October 2003, largely due to technical problems with the aircraft and their increasing age.

Concorde services have come to an end, but an experiment has recently been mounted by the German carrier Lufthansa which may have interesting possibilities. Both Boeing and Airbus offer corporate jet versions of their narrow-bodied aircraft, Boeing with its 737 and Airbus with the A319. In essence, because corporate jets do not need large amounts of belly-hold space to be

available for passenger's baggage, the manufacturers have used some of the belly-holds of their aircraft to install the extra fuel tanks necessary to give corporate customers the long ranges which they expect.

During 2002, Lufthansa entered into an arrangement with the Swiss-based corporate jet operator Privatair that Privatair should provide corporate jet services on three routes between Germany and the USA, with the aircraft configured with 48 all-Business Class seats. The services are branded by Lufthansa and sold through the Lufthansa marketing system. Users are given privilege and exclusivity, but have all the back-up in terms of frequency and network of Lufthansa's "normal" services. They are also able to gain points in the Lufthansa "Miles and More" Frequent Flyer Programme. An additional selling point is that Dusseldorf Airport is used, rather than Lufthansa's main hub at Frankfurt. This allows passengers to escape from most of the delays and security hassles that they might otherwise encounter. In any case, it would not be possible to mount the services from Frankfurt because of the slot shortages which exit there.

Since 2002, Lufthansa has continued with these services, and has expanded the number of destinations served. One must therefore assume that they are satisfied with the financial results. Also, Swiss International Airlines (now closely associated with Lufthansa), has begun similar services out of Zurich. Air France has also started a comparable co-operation with Privatair, though its All Business Class services are mainly on new routes (to oil-related destinations) that the airline has not previously served.

A final example of Value Added focusing in today's airline industry marks the policies being pursued by many smaller airlines from tourism receiving countries. Airlines such as Air Mauritius and Air Seychelles could be said to be engaging in a form of "Geographical" focusing. They cannot set out to conquer the world, but they can claim to know the particular country where they are based better than anyone else. Someone on holiday choosing them might feel that their vacation was beginning sooner than would be the case on, say, British Airways or Lufthansa where the flight to their holiday destination would be just like any other.

"Low Cost" Focusing

The airline industry does show one good example of firms which use their Focusing expertise to achieve very low costs, rather than to add value.

Europe has a long tradition of aviation activity by "Charter" airlines. Originally, these airlines developed because of a gap in the regulatory blanket enveloping European carriers, whereby Charter carriers were given much more freedom than Scheduled airlines, providing they kept to the so-called "Inclusive Tour" principle. This meant that they could not retail seats direct to the public. Instead, they were limited to a wholesaling role, wholesaling seats to tour operators. The tour operators would then add in the accommodation and other elements to make up a packaged holiday, and undertake the retailing of these holidays. The rules were essentially introduced as a compromise which allowed the Charter sector to develop, whilst giving a measure of protection to Scheduled carriers with their supposed obligation to provide year-round on-demand services

Today, these regulatory limitations have been completely removed (at least within the European Union) but the business model to which they gave rise persists. European charter airlines developed a way of working which saw them focus on one single activity – the wholesaling of blocks of seats to tour operators. In order to attract the business of these tour operators, they had to achieve one thing above all others – low seat-kilometer costs.

Such costs were achieved in a number of ways. The airlines used relatively large aircraft, because their customers were not seen as being frequency sensitive. Aircraft as large as the Airbus A330 became common in the fleets used by Europe's Charter airlines. Seat pitches were kept low, commonly at only 28 or 29 inches. Aircraft utilizations were pushed to remarkably high levels of 4200 – 4300 hours per year, spreading ownership and lease-rental costs. Achieving such figures was especially challenging because the market had a clear winter off-peak period. During the summer peak, aircraft were often flown throughout the night as well as the day, reflecting the fact that a proportion of package holiday customers were prepared to use "dead-of-night" departures providing that fares were low enough. Also, and in advance of the "Cost Leader" revolution which is now affecting them so much, Charter airlines kept with the idea that the provision of food and drink on board the aircraft need not be on a complementary basis. Instead, it was made a source of revenue.

Today, the situation facing Europe's Charter airlines is a very challenging one. The industry has mostly consolidated into two huge, vertically-integrated firms under the leadership of the German-based TUI and CNTouristic groups. This has made life hard for smaller independents. Also, customer needs have changed radically. Many people do not now require rigid package holidays containing the three elements of airline seat, accommodation and surface transfers. They certainly will not if they have their own accommodation with a villa or a timeshare, but generally now people are more experienced and adventurous, and are often prepared to put together their own holidays using the Internet.

In many ways, the newer Cost Leader airlines are better suited to these trends than the rigid model of traditional Charter airlines, and the Charter carriers have had to respond. Some have set up their own Cost Leader subsidiaries – My TravelLite and Hapag-Lloyd Express were both examples of this, although both have now been re-integrated into their parent airlines. Almost all of them have now set up web-sites to enable at least a proportion of their capacity to be retailed direct to the public. Monarch Airlines and Excel Airways are UK-based examples of carriers which have taken this initiative. In doing so, they have one crucial advantage over the Scheduled airlines. Because competition amongst the Charter carriers has been intense for a long time, these airlines generally do have the low operating costs necessary for them to compete. If they can maintain them, the Charter airlines of Europe do have a sound future, even if their business model will have to be substantially modified.

Overall, the history of the European Charter sector illustrates very well both the advantages and disadvantages of a Focusing approach. By focusing on a single activity, the Charter carriers were able to achieve a great deal of expertise in their single area of activity – expertise which for many years allowed them to hold off the competitive challenge of the 'Industry wide' airlines. This

was despite the latter having many synergies available to them as a result of being in different markets and offering different products under the one corporate umbrella. The Charter airlines have, though, been vulnerable once demand began to move away from the product that they had become so expert in providing.

"Lost-in-the-Middle"

Porter's Competitive Advantage model has one more concept we need to consider in the context of today's aviation industry – that of the "Lost-in-the-Middle" firm. Porter argues that there are firms that do not fit into any of the boxes. Their costs are too high for them to pursue Cost Leadership and there is too little about them which is distinctive for true Differentiation to be achieved. They are also too broadly-based in their activities to gain the benefits of expertise through Focusing.

Sadly, the airline industry today has an almost endless list of firms to which this description can be applied. As we have seen, the structure of the industry has always been distorted by ownership and control issues, with the result that there are many more airlines in the world today than would be the case if market forces had been allowed to prevail. If ownership and control constraints are eased in the future, (which is now looking increasingly likely), many of them will not survive, especially if rules about State Aid for struggling airlines are more rigidly enforced.

AIRLINE BUSINESS AND MARKETING STRATEGIES – COMMON MISTAKES

We have now almost completed our survey of the strategic options open to carriers in today's airline industry.

Unfortunately, the world's smoothest diplomat could not argue that the industry presents a picture of strategic success. Periods of severe loss-making have occurred regularly throughout the industry's history and, as we have seen, between 2003 and 2005 these losses were at a catastrophic level for many airlines. Bankruptcy has been a common feature, whilst a large number of carriers would not have survived without substantial government handouts.

When an airline fails, it is, of course, a tragedy for those affected. A bankruptcy does, however, at least give an opportunity for lessons to be learned. The problem with the airlines is that they rarely are. Each airline failure does, of course, reflect some unique circumstances, special to a particular case. What is so depressing, though, is that the same issues, mistakes and problems seem to arise time and again. In this last section of the chapter, we review some of these common mistakes made by failed airlines.

Objectives

The writing of classical economists suggests that firms should be viewed as rational entities, lead by entrepreneurial managers whose objective is profit maximization. In the airline business, such a theoretical position is often far from the true one. Airlines are set up and run for many reasons, which often make the achieving of satisfactory profits impossible. Sometimes, these objectives

may be imposed from the outside. Equally, they may reflect the failings of the firm's senior managers.

This situation presents itself most clearly in the case of many state-owned airlines. Almost all governments which still own airlines presumably expect that the carrier should be run to make a profit, to ensure that it is not a burden on the taxpayer. The problem is that either explicitly or implicitly, it is set a series of objectives which make profitability difficult or impossible. Amongst these is the need to maintain services on unprofitable routes for social or political reasons, or to assist economic development of backward regions. Also, airlines may be required to keep domestic air fares artificially low, due to the desire to control inflation, or to maintain unnecessary high levels of staffing because the government wishes to minimise unemployment. Even worse, though not strictly related to the question of objectives, governments often seek to interfere with airline management appointments, with senior management jobs being given to political supporters who have few qualifications to fill these demanding positions. A final, but sadly common problem in the developing world is that government employees and supporters travel a great deal on the national airline, but the government does not then pay the bill for this transportation. Ironically, many state-controlled airlines in developing countries are owed millions of dollars by the governments that own them.

The question of conflicting objectives is most obvious in the case of state-owned airlines, but as an issue it is not confined to them. Many private airlines are in practice operating to a mixed and confusing set of objectives.

Some privately-owned carriers are ego-trips for their owners. This is because aviation is a high profile activity where it is normal to achieve easily a great deal of media coverage. It is remarkable in the airline industry how many small airlines have grandiose names playing on the themes of an "intercontinental" or "world" presence. It is also noticeable that these airlines are often based in an impressive head office described as a "global headquarters" building. A further indication of an airline being driven forward by its owner's ego is that the owner then ensures that their name is incorporated in the name of the airline and that it is painted on the side of each aircraft in large letters. Ego-driven airlines are rarely successful because they tend to grow based on the owner's desire for more publicity and a still higher profile rather than on opportunities for profit. Even if the owner has very deep pockets, there will come a point where losses can no longer be sustained.

A further problem with some airlines is that they are essentially hobbies for those that set them up. Besides being a business, aviation also provides a fascinating hobby for many people. It is one thing to pursue this hobby by plane-spotting. It is quite another to take it to the extent of setting up an airline. Hobby-based carriers only tend to survive if the owner is extremely rich and prepared to lose a great deal of money.

A final, difficult objective for an airline to pursue in practice is that of being a vehicle for revenge. There have been a number of cases where someone who has been fired from one airline sets up a rival carrier designed to allow them to get even with the people who dismissed them.

Again, emotion rather than economics will be the driving force behind decision-making and success will be very difficult to achieve.

All-in-all, the foundation for a successful airline must be that the carrier must be profit-based in terms of the objectives it is pursuing. It must also have a clear and agreed strategy, based on the principles which have been discussed in this chapter.

Diversification vs. Specialization

Successful airlines are often those which successfully strike a very difficult balance between over-diversifying and over-specializing.

Over-diversification can take on a number of different forms. In the past, some airlines have diversified into travel-related businesses such as hotel and car rental. At first sight, this appears to be a sound move, allowing carriers to trade on the synergies resulting from being a "One-stop Shop" for the business traveller. It has, though, mostly turned out to be a mistake. It has resulted in a dilution of the top management attention being given to the demanding task of running the airline, and has provided competition for financial resources. More seriously still, it has meant diversification into industries which have exactly the same cyclical problems as the airline business. If airline seats are unoccupied in a downturn, hotel rooms will also be vacant and cars unrented, because suppliers are relying on the same person for each of these activities.

If there is an argument for an airline to pursue a diversification policy into other industries (which is doubtful), a stronger case could be made that they should concentrate on counter-cyclical activities which are likely to remain resilient in a downturn.

Another aspect of over-diversification occurs when an airline tries to cover too broad a route network with too few aircraft. If each route in a network is only served at a low frequency, a great deal of opportunity will still be available for competitors to invade the firm's markets. Southwest Airlines now has a fleet of more than 450 aircraft, but it still only serves 62 cities in its route network. It has always had a clear policy to build frequency as quickly as possible on a new route, to cement its control of the market. "Do the job properly, or not at all" is a sound maxim.

Despite these arguments, over-specialisation can be an equal problem. It occurs when an airline bets its future on success in a single market. For example, in the past, some airlines (notably so the now-forgotten UK carrier British Caledonian) have tried to build a route network concentrated on serving oil-producing regions. Such a policy will work well when (as at the time of writing) the oil price is high, but will fail disastrously during times of oversupply and low oil prices.

Pace of Expansion

A difficult issue with regard to successful strategies is that of the appropriate rate of growth which the airline should aim to achieve. It will be hard to ensure success without growth, for two reasons. Firstly, as they mature, airlines tend to find that their costs rise. This is mainly because

many groups within the airline are paid according to salary scales which mean that their pay increases each year that they remain on the payroll. Growth means that new members can be recruited at relatively low salaries because they will join at the bottom of their pay scale. Secondly, unless an airline grows it will not be taking advantage of new market opportunities as they become available. Besides a possible loss of profit, there is a strong likelihood that these opportunities will be taken up by competitors who will use them to further build the strength of their competitive challenge.

In the airline industry there is another, peculiar factor ensuring that growth opportunities need to be taken, reflecting the way in which airport slots are allocated. If an airport still has slots available, there is strong pressure on an airline to grow and use them because, once they have been obtained, they will be almost certainly be kept forever under the in-perpetuity principle of 'Grandfather Rights' which underlies slot awards. Much the same applies to the route licenses which are still necessary to take advantage of international Traffic Rights negotiated under the terms of Air Services Agreements.

Growth rates can, though, easily become over-ambitious. If a carrier attempts to grow too quickly, it will run the risk of becoming dependent on

borrowed rather then equity capital. In turn, this may mean exposure to exchange rate and interest rate fluctuations. Also, over-rapid growth may mean that an airline falls apart operationally. Airlines are a very complex interacting system where all aspects of the system much be functioning well together. If one component is fails, then the whole is at risk. At the extreme, this may manifest itself in a poor safety record and the disastrous consequences of a fatal accident. A less severe, but still serious, problem might, for example, be that potential customers are unable to make bookings because of a shortage of reservations capacity.

Of all the airlines that fail, a proportion do so because they do not grow fast enough. A far greater number, though, go out of business because of over-rapid expansion – a salutary lesson, perhaps, for those European Cost Leader airlines which, at the time writing are attempting to grow at rates exceeding 30% a year.

Competitive Response

Successful airlines tend to be those that manage their competitive strategies well, and unsuccessful ones those that fail to do so. This is especially a problem for new, small carriers. When a small, start-up airline first begins to fly, it poses a difficult problem for its larger, more powerful rivals. These carriers may launch a vigorous competitive response, and make life very hard for the newcomer. If they do though, they will be spending a great deal of money to deal with what is a minor threat to them. In particular if larger airlines respond with aggressive pricing, they will certainly be competing with a smaller rival. What they will also be doing, though, is offering discounted fares to the many customers who would have flown with them anyway. Because of this, they may be reluctant to respond strongly at first to any challenge. They may also fear that, if they do, they will be exposed to court action over allegations of anti-competitive behavior.

Because of these factors, a small new airline may often find that its early days of flying are marked by considerable success. On the basis of this, plans are then formulated for rapid expansion. These plans are usually helped by aircraft manufacturers being willing to offer large numbers of aero planes at low prices, and by suppliers of finance being quite happy to accept risk based on the asset value of these aircraft, or to lease aircraft on flexible terms. Unfortunately, once the expansion has begun, the new airline changes from an irritant to a significant threat to its more powerful rivals. It must then anticipate a strong competitive response, a response which will be especially serious if it coincides with a cyclical downturn as the industry enters a recession. As we have seen, the aviation industry never seems to have a shortage of start-up entrepreneurs, wanting to set up airlines. Even severe recessions do not dampen this enthusiasm – indeed they may increase it due to the cheaply-available resources which are on offer at such times. All the evidence of history, though, says that most of these airlines will fail, many after a very short time. Since the liberalization trend began with so-called US domestic deregulation in 1978, the proportion of failures has exceeded 90%. Many have failed because they underestimated the response of threatened, more powerful competitors. 'Don't get into a bleeding match with a blood bank' is a sound and necessary piece of advice.

"Control"

The "DotCom" excesses of the period from 1998 – 2000 demonstrated many important lessons for airlines. Too often, the entrepreneurs who set up dot.com businesses were seduced by the lifestyle that sudden wealth made possible, and lost sight of the fact that any business needs to meet a worthwhile set of customer needs and to charge profitable prices. The trappings of a supposedly successful business such as expensive cars and prestigious offices make no contribution to this. Airlines have just as much to fear. Some have failed because large sums have been spent on building an expensive head office building and on funding the lifestyles of the Directors and Senior Managers.

Over-optimism/Fall Back Position

Periods of relative prosperity will alternate with times of real difficulty, with recessions and now wars and the threat of terrorism providing daunting challenges. In such an industry, the most fatal business plan of all will be one which is based on the principle, "if everything keeps going our way, we'll be fine". Business plans have to be resilient to deal with sudden increases in uncontrollable costs such as the price of fuel. They have to address the likelihood that demand and particularly yield will from time-to-time fall away badly as a recession bites or a destabilizing war or terrorism incident affects the industry. They especially have to deal with the likelihood that a whole set of unfavorable circumstances may arrive at the same time, as they often do.In order to be able to do so, they need to have a fall-back position, the components of which will include a number of expedients. They may, for example take a proportion of their aircraft on relatively costly short-term operating leases, allowing for the return of aircraft to lessors if trouble strikes. Also, a proportion of support services can be bought in on a sub-contracted basis, allowing contracts with suppliers to be renegotiated in a down-turn.

MANAGEMENT OF AIRLINE PRODUCT MARKETING

Once an airline has its strategy in place, attention needs to shift to the translation of this strategy into the product design process. This Chapter looks at the theory of product analysis in Marketing and discusses the ways in which it can be applied to Marketing in today's airline industry.

WHAT IS THE "PRODUCT"?

At first sight, it might be thought that applying theoretical product principles to the airline industry is inappropriate. These principles have mainly been developed for industries dealing with tangible consumer products. The airline industry's "product" is, of course, an intangible one which is instantly perishable and cannot be stored. This is an argument which can be rejected. The airline industry's product may be intangible and many-facetted. It is still capable of providing − or failing to provide − customer satisfaction. It is also the case that many of the analytical models developed for analyzing products in Fast Moving Consumer Goods industries can also be used in the air transport industry. They do, though, have to be used in an analogous way, to take account of the intangible nature of the airline product.

THE THEORY OF PRODUCT ANALYSIS AND ITS APPLICATION TO THE AIRLINE INDUSTRY

The Product Life Cycle: In all areas of marketing, the processes of product development, product innovation and product management need to be continuous and never-ending. The reasons for this are derived from the model illustrated below.

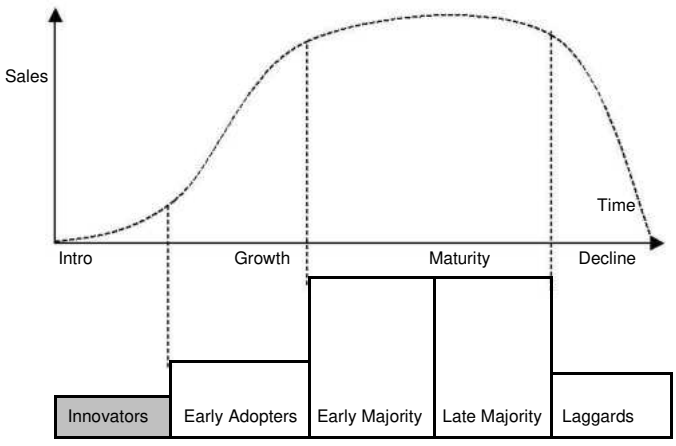


Figure 5:1 The Product Life Cycle

When a new product is introduced into the market, it is inevitable that it will first go through the so-called introductory stage of the Product Life Cycle. The product is new, so there will not have been time for advertising and promotional work to come to fruition. Also, the product will not benefit from so-called "Imitative Buying", because few people will know about it, and fewer still will be using it.

The Introductory stage will be a crucial stage in the life of a product. Some pass through it and go on to be successes. A far greater number do not. Instead, sales are disappointing and the product has to be withdrawn from the market after a short time. Somewhere between 60% and 80% of new products eventually come into this category.

Sadly, the aerospace industry illustrates well some of the risks involved in product innovation. For example, Concorde was completely unsuccessful in achieving commercial sales and had to be withdrawn from production as a marketing disaster. The only aircraft operated commercially were those given to Air France and British Airways under the most favorable terms. A more recent case was the Advanced Turbo-Prop of British Aerospace. This aircraft, a 64 seat propeller-driven plane, was abandoned after fewer than 40 had been produced. Even re-naming it the Jetstream 61 failed to change its fortunes. The Saab 2000 aircraft had a similarly short and disappointing Life Cycle, again being withdrawn after very few had been sold. In 2005, Boeing had to stop production of its 717 aircraft after only a relatively short time.

Airline marketing also illustrates the perils of innovation. Many airlines have the experience of launching a new route amidst great optimism, only to find that the financial results are so disappointing that it has to give up very quickly. Some have made an innovation in their in-flight product, only to find that this is unpopular with passengers and has to be quickly withdrawn. An example of this came in 1990 when Lufthansa up-graded product standards in the rear cabin of its aircraft in Europe, and re-named the whole of this cabin "Business Class". It was a change which was unacceptable to those passengers who had paid higher fares and who felt that they were entitled to greater recognition. Innovation can also be risky in terms of selling or distribution concepts. For example, in the late 1980's British Airways invested in a new chain of up-market travel shops in Britain's high streets using the branding of "Four Corners Travel". Again the concept had only a short life. It was soon discontinued, with, presumably, substantial losses having to be written off.

An example of a failed product innovation which combined together issues in both aerospace and airline marketing occurred in 2006. Earlier, Boeing had launched an initiative to offer airlines the opportunity to give their customers onboard access to email and the internet. This was done using the brand named of Connexion by Boeing. Unfortunately, it did not turn out to be a success. The necessary equipment proved to be costly and unreliable, and added significantly to aircraft weight – a problem which was particularly serious at a time of high aviation fuel prices. Eventually, Boeing had to bow to the inevitable and withdraw the product from the market, after it had been responsible for accumulated losses of more than three hundred million dollars.

There is now substantial literature in the theory of marketing about product innovation. This has largely been derived from the work of the US marketing professor, E. M. Rogers. Using Rogers'

principles, it is possible to suggest that new products must show at least the following characteristics if they are to be long-term successes:

1. Relative Advantage

Clearly, new products must be substantially better value-for-money than those they are replacing, in order for consumers to accept the risks of using them.

2. Compatibility

An innovation is unlikely to be successful if it is a very radical departure from the existing ways in which business is done in the market sector in question, or if it is incompatible with prevailing ethical or moral standards. At the time of writing, this might apply to products which were seen as having an unacceptable environmental impact. For example, if Boeing had moved ahead with the plans announced in 2002 for a so-called 'Sonic Cruiser' (an aircraft with a significantly higher cruising speed than today's aircraft, but with a much higher fuel consumption) Compatibility questions would certainly have affected the likelihood of a successful product launch.

3. Complexity

Some innovations fail because they are perceived as being extremely difficult to use, requiring purchasers to invest a great deal of time and effort in becoming familiar with them. As we have seen, part of the appeal of Low Cost Carriers has been that making flight bookings with them over the internet has been so easy.

4. Divisibility

It is often easier to persuade consumers to take a series of short steps, rather than one very large and risky one. Each small step can then be portrayed as a trial, the successful completion of which allows confidence to be built. For example, in aerospace marketing, it may be much easier to persuade an airline to buy a large fleet of a particular aircraft if short-term leases of one or two aircraft have demonstrated that the aircraft will perform well in the airline's particular operating environment. The principle of Divisibility is also very well illustrated by the growing popularity of so-called Fractional Ownership schemes for business jets. Here, the manufacturers of these jets hope that experiencing the product through a Fractional Ownership plan will result in a company or an individual eventually buying their own aircraft

5. Communicability

Customers are unlikely to be persuaded to buy a product if the benefits this product will bring cannot be communicated to them persuasively.If these features illustrate some of the requirements of successful product innovation in air transport marketing, it is equally instructive to look at some of the common mistakes that lead to product failure. Products will fail if the size of the market for them has been over-estimated through poor or non-existent market research. They will also fail if the product cannot be delivered on time, or does not perform well even when it is. Mistakes can also be made in pricing policy, with the product either being offered at a

price which is too high relative to the benefits it will bring, or too low (in the case of so-called "Status Goods") to give the necessary aura of exclusivity. Finally, promotional or distribution policies may be poorly thought-out. For example, advertising campaigns may offend rather than excite potential customers, or the incentives which are given to distribution channel intermediaries may not be enough to encourage them to push the product strongly. All in all, product innovation represents an extremely challenging part of the product management process, with the range of possible mistakes explaining easily why so many products fail to get beyond even the Introductory stage of their Life Cycle.

Let us now make the assumption that a new product does get beyond this stage, and enters the so-called Growth phase of the Cycle. Here, sales accelerate markedly as advertising and promotional work comes to fruition, and the product benefits from imitative buying as consumers see it being bought and used by others. Clearly, the onset of the Growth phase is good news for the innovating firm. Substantial amounts of cash will begin to flow in, allowing the original research, development and promotional costs invested in the product to be recovered. Also, production volumes can be increased, bringing the Economies of Scale and Learning Curve effects which will permit lower unit production costs.

The Growth phase does, though, hint at some of the problems which will have to be addressed during the later, much more challenging, stages of the Cycle. When it begins, there will be the task of ensuring that production rates are increased to meet the rapidly-rising volume of demand. If they cannot be, there is a risk that a major marketing opportunity will be lost if potential customers are not prepared to wait in order to take delivery. Later in the Growth phase, there will almost certainly be the first worrying signs of a classic problem of product management: the firm's competitors will see the success of the innovation, and will begin the research and development of their own rival products. In a sense, they will not have to carry out their own market research or demand forecasting exercise. The innovating firm will have done this for them.

The leading firm will hope that the Growth phase will go on for as long as possible. It cannot, though, continue forever. Eventually, the Maturity stage of the Product Life Cycle will arrive. Here, firstly, the growth in the size of the total market for the product begins to slow, Most of the people who can be persuaded to buy the product have already done so. The market therefore begins to progressively change from one of growth to one of replacement. Replacement sales are rarely enough to maintain, let alone expand, the volume of demand.

The other change of the Maturity phase is more serious still. By this time, rival firms will have had time to complete the research and development of their own, competing products. These will be introduced into the market, probably in rapid succession. Worse still, these firms will have had the benefit of being able to study the product of the innovator. They will have been able to isolate its weaknesses and, almost certainly, to develop a product which will leapfrog the standards set by the innovating firm. The Maturity phase of the Cycle is a very challenging one. By this stage, the market is no longer growing rapidly. It is also becoming saturated with

competition. Strong product management skills will be needed if the success established during the Growth phase is to be continued in Maturity.

In responding to the challenges of Maturity, the situation is by no means hopeless. By this stage, the original costs of developing and introducing the product will have been recovered. It will therefore be possible to make profits at lower prices. Also, the firm should be getting the maximum benefits from production Scale Economies and from the Learning Curve effects which make production more efficient. Again, these factors will increase financial flexibility. The task in managing mature products is to use this flexibility in the most telling way.

A first possible response is to invest money in the product itself. This can be used to improve its specification so that it catches up with and preferably overtakes the value-for-money on offer from the products which have arrived in the market later. It can also be used to modify the product so that it can be used to exploit other, hopefully less saturated, markets. Alongside investment in the product, discounted prices can be offered as a possible way of ensuring that growth in the total market resumes, or that a greater share of the existing market is obtained. Also, increased investment in advertising and promotion can be sanctioned with the same two purposes in mind. Finally, greater incentives can be offered to firms in the distribution channel through higher commissions or greater mark-ups.

If the right balance of these measures is correctly applied, there is no reason why the success of a product established during a Growth phase cannot be continued for a considerable time once the onset of Maturity has begun. For many products, though, such success cannot be prolonged indefinitely. They will eventually reach the Decline phase of the Life Cycle. This is where market growth comes to an end, and the product is overwhelmed by newer rivals, Once Decline sets in, there is no choice but to abandon the product and take the resources devoted to it and use them for more rewarding purposes.

The inevitability for many products of a Decline phase poses another challenge in product management. If a firm wishes to continue in business and expand, it will be making a grave mistake if it leaves investment in research and development of new products until the Decline phase of its existing products sets in. If it does, the result will be a disastrous period of poor sales and loss of reputation. Instead development and innovation of new products must begin whilst existing products are still doing well.

Product Life Cycles in the Aviation Industry

The Product Life Cycle is well-illustrated by applications which can be found both in the aerospace industry, and, by analogy, in airline marketing as well. In aerospace, a very good illustration of successful product management comes with the world's biggest-selling commercial aircraft, the Boeing 737. The 737 family has a long history - the first 737s were introduced in 1967 - but it continues to sell well today. It does so because, at all stages of its Life Cycle, Boeing has managed the product skillfully.

It is now often forgotten, but when the first 737s were delivered in the late 1960s, there were no signs at all of the enormous success that the aircraft would become. Early sales were slow, and the initial aircraft − designated 737-100s − performed poorly. Such was the scale of the early disappointments that, when it faced a financial crisis in 1972, Boeing came very near to withdrawing the aircraft and stopping production. Thus the 737 was close to being one of the many product innovations that fail to get beyond the introductory stage of their Life Cycle. Boeing did not do so, though. Instead, an improved version of the aircraft, the 737-200, was put on the market. This entered a very clear Growth phase in the 1970s, achieving more than 1000 sales during the decade.

By the early 1980s it became clear that the success enjoyed by the 737-200 could not continue indefinitely. The aircraft was not especially fuel efficient at a time when fuel prices were very high. It was also noisy, when environmental resistance to aircraft noise was increasing and the first signs were appearing that excessively-noisy aircraft would be banned. Finally, the early 1980s saw Boeing's increasingly-confident European rival Airbus planning what has become the highly-successful A320 family. The B737 was clearly reaching the Maturity stage of its Product Life Cycle.

The reaction of the company was a very positive one. Instead of ceasing production as they might have done, Boeing invested further by introducing three new versions of the aircraft, the -300, -400 and -500 series. These featured a fuselage stretch (in the case of the -300 and -400. The 737-500 was the same size as the -200), a more up-to-date cockpit and quieter, more fuel-efficient engines. These new models revitalized the product, to the extent that more than 2000 aircraft were sold between the beginning of the 1980's and the early 1990s.

By 1994, the 737 was again under threat as the Airbus A320 family expanded and became better established. Then, though, Boeing launched further developments in the form of the -600, -700, -800 and -900 737's. These aircraft have again sold well, confirming the 737 as by far the most successful aircraft family ever in terms of the number of units sold. Boeing is currently in the process of extending the family still further with another stretch of the aircraft, but the company knows that even its Life Cycle will come to an end eventually. Early plans are being made for the development of an all-new family of aircraft to replace the 737 sometime during the next decade. It is clear that Airbus will also introduce a replacement for the A320 at around the same time.

A second, equally convincing, illustration of Product Life Cycle concepts in the aviation industry can be found in the history of Frequent Flyer Programmes. FFPs are a major issue in Airline Marketing today. The first programme, the Advantage scheme, was introduced by American Airlines in 1981. It was, of course, then perfectly possible that this would turn out to be an unsuccessful idea, unpopular with customers and abandoned quickly. It did not, though. The programme passed quickly through the Introductory stage of its Product Life Cycle and entered a rapid Growth phase. Soon, the programme had many millions of members and was having a significant impact on choice-of-airline decisions in the US domestic market.

Once this had happened, it was certain that American would not be left alone to enjoy its success. The very extent of this success meant that its rivals had no choice but to follow. They did so, first in the US domestic market and then, progressively, internationally as well. At the time of writing, FFPs are at the Maturity stage of their Life Cycle. Almost all airlines are participating in FFPs either by running their own programme or by forming partnership and franchising agreements with those who do. Also, most of the programmes are now similar in terms of the benefits they offer − a clear sign of the commoditization one would expect at Maturity.

There are now early signs that FFPs may be reaching a Decline phase of their Life Cycle. The programmes are becoming increasingly unpopular with corporate travel purchasers, who argue that they tempt irresponsible employees to take unnecessary journeys to accumulate extra mileage or to protect their programme status. FFPs also make it more difficult to implement changes in corporate travel policy due to "Switching Cost" effects. Many Corporate Travel Managers are now insisting that FFP points are awarded to the company, or are not given at all. Instead, they require increased levels of corporate discounting. All these factors may, in some cases, make FFPs less important in airline marketing in the future then they are today. Also, airlines are now moving to neutralize their effects. The growing links between the different FFPs within airline alliances mean that often passengers can obtain mileage points in the programme of their choice, irrespective of the airline they actually choose to fly. This is, in reality, an admission by the airlines concerned that the effect of FFPs on market share is increasingly a neutral one, but one which comes at a high cost.

A third, and especially fascinating, illustration of the application of the Product Life Cycle comes with the marketing of leisure air travel and of vacation resorts. It requires an understanding of a further aspect of Life Cycle theory. At different stages, of a Life Cycle, different types of customer are buying a product, because people vary in their attitudes to new products. When a product is at the Introductory stage of its Life Cycle, the people who are most likely to buy it are known as Innovators. Innovators are people who have relatively high disposable incomes. They tend to be well-educated, confident, and adventurous in terms of their willingness to experiment with new purchases. They are also often insecure and status-conscious, anxious to impress their friends and acquaintances.

Because of these characteristics, a particular marketing mix will often be required at the introductory stage of a product's Life Cycle, if the introductory period is to be negotiated successfully and lead to a profitable Growth phase. The product must be positioned as fresh, innovative and exciting. Advertising and promotional policies must emphasize it as status-enhancing, and something which only the smartest of consumers are yet able to appreciate. Often, a high price will also be needed as a further way of emphasizing a product's exclusivity. Late in the Product Life Cycle, a completely different type of customer will need to be targeted. By this time the product will be seen as old-fashioned by Innovators. Instead the target market will consist of so-called Laggards. Those people who will only buy a product when it is very well-proven. They will usually have only a relatively low disposable income, and will often be

poorly-educated and also be fearful of the risks involved in buying a new and, to them, untested product. They may be less status-conscious than Innovators.

Bringing Laggards into the market requires a significantly different Marketing Mix, compared to the one which will need to be used to attract Innovators. The product must be positioned as well-tested, tried, and proven to work. Sometimes, even shame will be used as a marketing weapon by pointing out how widely used the product is and how behind-the-times non-users are. Testimonials from satisfied customers will also be a common tactic. Prices will have to be kept low, reflecting the generally-lower disposable income of Laggards.

The theory of Innovator and Laggard behavior should be applied in Airline Marketing to the marketing of holiday destinations. When choosing their holiday, Innovators will often be prepared to travel to new, untried places, because of their adventurous spirit. They will also want to visit somewhere that is status-enhancing. A new resort area will therefore find a readier audience amongst Innovators. The problem that then arises, though, is that Innovators make up only a small percentage of the population − perhaps only 5% of people show true Innovator characteristics. There is always a temptation on the part of those who manage resort development to aim at a move into mass tourism, to bring greater benefits in terms of employment and balance-of-payments gains. The problem of doing so is that once a resort becomes known as a destination for the mass market, it will at the same time become unattractive to Innovators because "everyone" is going there. This is serious because, although small in numbers, Innovators usually have very high disposable incomes.

The history of visitors to some of Spain's holiday resorts illustrates this use of the theory of the Product Life Cycle very well. In the 1960's Spanish resorts such as Benidorm, Torremolinos and Lloret del Mar were seen as exciting and different at a time when most people were still taking their holidays close to home. By the 1980s the reverse was the case. The resorts were associated with noise, congestion and unruly behaviour, and were no longer visited by the well-off travellers who could contribute the most to the local economy. During the 1990s it became necessary to spend large amounts in cleaning up the resorts in an attempt to reverse these adverse trends.

Managing a Product Portfolio − the "Boston Box"

The management of Product Life Cycles is important in Airline Marketing today. It does not, though, provide the sole basis for effective product management. Most firms do not deal in only a single product. Indeed, any that do are probably dangerously over-specialized. Many firms have a range, or portfolio, of products which may run into hundreds or even thousands of different products. They need a framework which will guide their decision-making so that the contribution of each of the products to corporate profitability is maximized.

The classic method for analysing a Product Portfolio is known as the Boston Box, because it was developed by the US Boston Consulting Group. It was first introduced in 1963, and has remained a cornerstone of product management policies ever since.

The model classifies products using two variables: the size of the total market and the share of the market held by the product of the firm in question. (In some versions of the product then the second variable is the share held relative to the share of the market leader). This allows a division into so-called Wildcats, Stars, Cash Cows and Dogs. Each of these types of product needs to be managed in a different way. In Airline Marketing, an often very instructive use of the Boston Box is to apply it to an airline's route network. By analogy, this can give some very useful messages as to how each route should be managed.

A Wildcat route is one where the traffic as a whole is growing strongly, but where the airline concerned has only a small share of this rapidly growing market. Wildcats require both patience and continuing investment. Patience is needed because in the short-term a Wildcat may be a loss-maker. If the growth prospects of the route are good enough, these losses should be accepted and a presence maintained. This is especially so given the regulated nature of competition in many air transport markets, and the ways in which airport slots are allocated. In international markets, if an airline withdraws from a route, it may lose its status as its government's designated carrier on the route in question, with the relevant Traffic Rights instead given to another airline. It may also have to surrender some airport slots, with the risk that these again will be given to another airline. The overall effect may then be that when it wishes to re-enter the market it will not be able to do so.

For many airlines, routes to India and China are currently exhibiting 'Wildcat' characteristics. The rapid growth being experienced in these countries means that carriers should maintain a long-term presence, even if short-term losses are incurred. The Star situation is one where the overall market is growing quickly and the firm's product has a good share of the market. Star products are obviously strong ones for the firm in question, and they should be a significant source of profit. They do, though, require intensive and costly management. This is because the rapid growth in the total market will provide a continuing incentive for new competitors to enter them. Established firms will therefore have to spend heavily to defend their position. This spending will need to encompass continuing product investment and substantial efforts in the direction of advertising and promotion. Pricing will also probably be very keen, with thin profit margins. All-in-all, Star products are often those which provide a high proportion of a firm's sales volumes, but a significantly lower proportion of its profits.

The aero-engine market illustrates the principle of Star products very well. The market for big-fan engines powering large jet aircraft is a huge one. The competition, though, between General Electric, Pratt and Whitney and Rolls-Royce is intense. All three firms have to spend large amounts on continuous product development and improvement. (Because of this, General Electric and Pratt and Whitney have combined forces in part of the market, to form the so-called Engine Alliance) Pricing is so keen that it is believed that often engines are sold for less than the cost of producing them. The manufacturers then hope to obtain a return on sales of spares and product support through the lifetime of the engine. For each manufacturer, the big fan engine market produces large sales revenues, but often only relatively thin profit margins. For Cost Leader airlines, intra-European routes illustrate Star principles well. The market is very large and growing rapidly, but the growth has attracted an explosion of new entry that, increasingly, is

likely to hold down profit margins. The next the Boston Box category is the Cash Cow. This is the one where the product in question still has a good share of the market, but where the total market is no longer growing strongly.

The fundamental difference between Stars and Cash Cows is that the Cash Cow market will no longer be an attractive one for new entrants. Established firms will have invested to gain their place in the market, and should be able to continue to exploit it successfully. New entrants, though, will have to spend especially heavily if they are to challenge the existing players. Entering a new market will always be costly. It will be particularly expensive, though, to enter a market which is not growing. A growing market allows a new firm to hope that it will be able to become established on the basis of new demand rather then by having to take existing customers away from their suppliers. This will not be possible in a stagnant market. Success will only be possible for a newcomer if it succeeds in taking market share from other firms. It is an undisputable fact that growing with a market can be achieved relatively cheaply. Growing by taking share from others will always be a costly and risky activity, one which is unlikely to yield a return to a new entrant.

For existing firms, of course, Cash Cows should be a major source of profit, because they will not have to protect themselves so much from the activities of newcomers. The problem will often be that though the milking of Cash Cows may be extremely profitable, the lack of growth in the total market means that these milking opportunities may not continue for long. The aero-engine market again provides a good illustration. We have already seen that in this market, the big firms have to invest heavily to maintain their position. For some years, one of the firms in this market, Rolls-Royce, appeared to have a product which conformed to Cash Cow principles.

Alongside its larger engines, Rolls-Royce offered its Tay product, a small engine of 15,000-17,000 lbs of thrust. The Tay was itself a relatively unambitious investment based on the core of an older Rolls engine, the Spey. The Tay, however, enjoyed a favourable position, because General Electric and Pratt and Whitney for a long time offered no engine in this class. The Tay therefore had a virtual monopoly in the three markets where it was used, for the Fokker 100 and Fokker 70, the Gulfstream business jet, and in the re-engining of older noisy jets. One's guess is that Rolls enjoyed strong profit margins on Tay sales. The Tay also illustrates the point that Cash Cow products may not be available to milk for very long. The Fokker company went into bankruptcy in 1996, and production of the Fokker 70 and Fokker 100 stopped. It has never resumed, despite efforts being made to bring this about In addition, recent years have seen many Fokker aircraft parked, removing from Rolls the income from spares and support.

For airlines, Cash Cow situations occur on any route where future growth prospects are poor. An example at the moment is the is routes between London and Paris and London and Brussels. These routes have been affected by railway competition as a result of the opening of the Channel Tunnel. This competition will become more intense once a fast rail link has been completed between London and the Tunnel in 2008. This will reduce city centre to city centre journey times to below the critical three hours duration.

Because of these poor growth prospects, it would be a foolish airline that decided to enter these markets today. With little traffic growth, they could only establish their position by taking market share from some very strong established carriers. With new entry therefore unlikely, these established airlines should be able to exploit the available demand relatively unchallenged. There may come a time though, when the effect of surface competition means that the route changes from a profitable Cash Cow into the next Boston Box category, the Dog.

Dog products are those where the total market is not growing and the firm has only a low share of the existing small market. Once a product has been finally classified as a Dog, there is a clear product management message. It should be abandoned and the resources which might otherwise have been spent on maintaining it and on attempts to improve market share should instead be devoted to much more promising Wildcat situations.

We have already referred in the last section to British Aerospace's decision to withdraw its ATP (later, Jetstream 61) aircraft from the market. They presumably did so because it matched the characteristics one would expect of a Dog very well. The ATP was a 64 seat turboprop aircraft. Growth prospects for the market of turbo-props in this size bracket at the time were poor. The reason was that regional jets of similar size were being produced in increasing numbers, and these aircraft seemed to have a clear edge over turbo-props in terms of passenger appeal. This meant that more and more airlines were choosing them, despite their somewhat higher operating costs. At the same time, the ATP achieved only a low share of the market with sales being dominated by its rivals the Franco-Italian ATR 72 and Canadian Bombardier Dash-8 (Ironically, at the time of writing, turbo-prop sales are reviving, with their operating economics looking especially good with fuel prices high).

For airlines, the use of the Dog category is, by analogy, the route withdrawal decision. Almost all airlines find from time-to-time that they have routes where traffic is not growing, where they have a poor market share, and where losses are being incurred. They must give up service on these routes and take the resources used to serve them to more promising situations.

Balancing Risk and Opportunity − - the Ansoff Matrix

The Boston Box allows for some important rules for product management to be defined. One further model is, though, very useful in the search for a complete range of decision-making tools. All firms have to balance risk and opportunity in their product planning decisions. The firm's profits will be a reward for its risk-taking, and too conservative an approach will mean that profits will be foregone and market opportunities will be left open for competitors. At the same time, if too many products are introduced which are risky, the result will be financial disaster if things go wrong.

If what is effectively a "Do-Nothing Case" is unacceptable, firms must do more than simply offer existing products to existing customers. To do so, they must balance risk and opportunity in the way described in Boxes Two and Three of the Ansoff Matrix. Box Two describes taking existing products and offering them to a new market. For example, a firm having a successful range of products selling well in a domestic market might decide to move into exporting. Box

Three is the situation where new products are developed for markets where the firm has a sound knowledge of customer requirements and established customer loyalty. For example, we have already referred (in Section 4:4:2) to Lufthansa's introduction of All-Business Class corporate jets on routes where it already had a strong presence in the business travel market through its conventional services.

CUSTOMER SERVICE-RELATED PRODUCT FEATURES

Point-of-Sale Service

Point-of-sale service is the term used to describe service offered to the customer at the point where they are actually making a booking. It is an area where revolutionary changes have occurred over the last five years.

Point-of-sale service has always been difficult for airlines because of the large number and wide variety of sales outlets they have used. In the past, some airline customers have wished to deal with them direct. The traditional methods to allow this have been downtown ticket offices, airport ticket desks and call centres. In addition, airlines have had to make themselves accessible to travel agents, with over 80% of bookings traditionally being obtained through agents. A final source of business has been from other airlines on an interline basis. Though the nature of interline relationships is now changing, it is still the case that a passenger wishing to book a multi-sector journey using several different airlines can do so by contacting only the first carrier (assuming that they are proposing to use a relatively expensive flexible ticket). This airline will then contact the others to make the necessary bookings.

Given this range of outlets, the point-of-sale task would always have been difficult for airlines. There can be little doubt, though, that by their own policy decisions traditional 'Legacy' airlines made it a great deal harder. In particular, by adopting very complex fare structures and reservations procedures, they increased point-of-sale transaction times and also ensured that the systems could only be accessed by trained experts. In turn, this further increased the proportion of bookings coming through the travel agency system and raised commission and booking fee costs.

To try to address the problem, the response of many airlines was to invest large sums in the development of so-called Global Distribution Systems such as Amadeus and Sabre, which we will cover fully in Section 7:3. Though to some degree these arrested the rise in processing costs by improving staff productivity, they proved costly and controversial. They were also to a large extent addressing the symptoms of the problem rather than the problem itself.

It has taken the Cost Leader revolution we referred to in the last chapter as well as the growth of widely-available internet access, to radically change the situation. As we have seen, by making fares and reservations procedures very simple, these airlines have been able to move to a "self-service" approach, with a high proportion of their bookings being made on-line by passengers themselves. This has resulted in very large cost savings in terms of commissions and administration, and is a policy which many traditional airlines are now belatedly following.

Reservations and Overbooking

For most air travellers, a pre-booked reservation they can rely on remains an integral part of the product that they expect from airlines Today, the availability of cheap computing power means that most of the technical problems associated with providing them have been resolved.

There is still one air transport product where a reservation is not offered. This is with the pure form of the so-called Shuttle concept. Pioneered by Eastern Airlines in the USA in 1961, the idea of the Shuttle is that passengers do not need to book in advance. Instead, the airline guarantees to fly all those who report for a flight. They can do so by keeping back-up aircraft and crews, which are called into action if the number of passengers checking in for a flight exceeds the capacity of the aircraft allocated to it. The Shuttle concept brings a number of theoretical advantages. Passengers are saved the trouble of making reservations, and airlines the cost of recording them. Also, most Shuttle passengers pay at the airport. The business therefore comes direct to airlines with a useful saving in commission costs and some cash-flow benefits. It also helps to cement market control.

Shuttle concepts continue to be used in the USA, with, for example, US Airways and Delta still flying Shuttle flights between New York, Washington and Boston. The concept is in decline, though, in other markets. It requires a very large commitment of resources of aircraft and crew. These only achieve poor utilization because of the rarity with which back-up aircraft will be needed outside of the peak periods. Also, airport slot constraints are becoming more and more severe. In order to protect their so-called “Grandfather Rights” on the slots they have been allocated, airlines need to use them on a minimum of 80% of occasions during a given traffic season. There can be no certainty that they will do so if these slots are allocated to Shuttle back-up flights. Finally, through the advent of very capable Revenue Management systems (dealt with in the next chapter), carriers are now much more successful at selling seats on off-peak flights at low, but still profitable, prices. It is therefore often a worthwhile option to fly a route with an aircraft which will cater for all the peak time full-fare demand. Though this aircraft will then be too big for the level of such demand at off-peak periods, lower fares and careful capacity management can be used to produce worthwhile returns even on these flights. This may well be a cheaper and more profitable option than flying all services with a relatively small plane and augmenting peak-time capacity with a costly back-up aircraft.

An illustration of changing attitudes towards Shuttle services came in the UK domestic market in 1997. British Airways had flown domestic trunk services from Heathrow using the Shuttle principle since 1975. In 1997, though, the guarantee of a seat for all those reporting for a particular flight was discontinued, with all passengers expected to make a reservation. At the same time, the making of reservations was made easier by the adoption of “ticketless travel”, a development.

If reservations are to be required in almost all cases, airlines still have to address another difficult problem: many passengers do not turn up and use the reservation they have made. The proportion of occasions where this is so varies from market to market, but it is quite common to find 10% of bookings coming into the “no-show” category. There are many reasons for this.

Some passengers fully intend to get to the airport to check in for their flight but are prevented from doing so. They constitute accidental no-shows. Last minute illness or death will be an obvious reason for accidental no-showing. Other reasons will include traffic delays on the way to the airport and the passenger experiencing a late in-bound connecting flight.

Not all no-shows are accidental, however. Many are deliberate. For example, business travellers who are uncertain about the time at which their meetings will end may book seats on several flights with different airlines. They will then have a convenient return flight whatever the actual finishing time. Another problem may occur when an unscrupulous passenger is holding a Standby ticket for a particular flight. They have an incentive to phone the airline a number of times making false bookings using fictitious names. The result will be no-shows, meaning that the Standby passenger will be accommodated.

Given such a significant no-show problem, it might be argued that airlines are themselves creating the problem by an over-generous attitude to those who book but fail to check-in for a flight. All service industries face the same problem as airlines, that their output is instantly perishable and cannot be stored. Some – cinemas are a good example – require customers to pay at the time of booking and no refunds are given if they fail to show up for the actual performance. As mentioned in Section 4:2:3, many Low-Cost Carriers take a similar approach. They will only deal with customers who have credit or debit cards. Card details are taken by the airline when a reservation is made and the card is automatically debited. This gives the carrier a guaranteed income and removes the necessity to overbook. Other, less radical airlines are increasingly making some of their lower fares non-refundable.

Despite the attraction of this idea, it is not a practical one for airlines in all circumstances. In particular, business travellers often regard the right to no-show as an important part of the flexibility they are buying when using an expensive fare. If one carrier unilaterally made such fares non-refundable in the event of a no-show it would lose significant market share to its rivals.

If a degree of no-showing is inevitable, airlines have a strong incentive to overbook, and, perhaps perversely, their passengers will also benefit as a result of such a policy. By overbooking, load factors can be increased, which will in turn allow fares to be lower. Also, overbooking permits more passengers to travel on the flight of their choice. If an airline did not overbook, it would only accept reservations up to the number of seats on an aircraft. All other requests for bookings would be refused. However, if, as would be very likely, there were no-shows, the flight would take off with some of the seats unoccupied. Ironically, there would then be passengers using later and presumably less convenient flights who could in fact have taken the flight of their choice.

There are thus clear advantages which will accrue to the customer if an airline practices overbooking which will be lost if it does not. Despite this, overbooking remains unpopular. Of course, an airline should use historical records to help fix the amount by which each flight should be overbooked. If a conservative estimate is made, on almost all occasions there will be no problem. The number of no-show passengers will exceed the amount of overbooking and all passengers will get on the flight. However, no matter what degree of care is exercised, there will be occasions – hopefully rare – when difficulties arise. Then, the random element present in

patterns of no-showing means that the number of passengers reporting for a flight exceeds the capacity of the aircraft being used for it. Some passengers will therefore be "bumped".

In the past, airline approaches to this problem were totally unsatisfactory. Too often, the passengers selected for bumping were the last ones to check in. This was expedient, in the sense that these passengers would not have baggage already loaded into the aircraft lower holds, which would otherwise have to be retrieved for security reasons. However, these late-arriving passengers would often be business travellers. They would therefore be commercially important to the airline. Also, as business travellers, it would often be vital that they should get the flight on which they are booked, because they had meetings to attend, or onward connections to make.

Today, better-managed airlines are more sophisticated at handling bumping situations. Their aim is to identify, and to compensate, the passengers who are prepared to accept a delay. These are clearly unlikely to include business travellers. If such a passenger is, for example, flying to negotiate an important contract, no amount of compensation will be sufficient to make up for the fact that they miss their meeting. Many leisure travellers, though, will find the offer of compensation an attractive one. It may not matter to them a great deal whether they reach their destination today or tomorrow, especially if they receive a cash payment in compensation. Airlines should therefore seek volunteers for off-loading on those flights where they expect to have problems. In doing so, they can provide a valuable protection for their commercial reputation. A further incentive for them to do so, at least in the European Union is that now substantial compensation has to be paid to passengers who are involuntarily bumped from a flight and face a substantial delay as a result.

Airport Service

As in all other areas of product design, airline decisions about the level of airport service they offer to their customers will be a reflection of their overall business strategy. Low-fare airlines will find airport service a major area where they can achieve economies to ensure that their low fares will be profitable. They often use uncongested airports, which may sometimes impose inconvenience on passengers by being far from the cities they are designed to serve. They may insist on longer check-in times to enable a smaller number of check-in desks to be used, or, increasingly encourage check-in to be undertaken in advance on-line. A simple bag-drop facility is then all that is needed at the airport, though even here, charges are now often made for each piece of checked baggage, both as a way of producing additional revenue and to encourage people where they can to limit themselves to hand baggage only. No special lounges are provided, resulting in a significant cost saving. Finally, the boarding process will be a usually be a simple one on a "first come, first served" basis with no pre-allocation of seats.

For airlines aiming to penetrate the market of frequent business travellers the task could not be more different. Major efforts have been made in recent years to establish airport service as a significant area of product differentiation. Some carriers now provide limousine services to pick up premium-fare passengers at their home or office to bring them to the airport – Virgin Atlantic, Continental and Emirates are examples. Once there, kerbside check-in facilities may be on offer to remove the necessity of carrying heavy baggage into the terminal. If they do come into the

terminal to check-in, a separate, uncongested desk will be provided. There may then be provision for a preferential channel for moving through passport and security formalities, before the passenger is invited to use what will generally be an extremely luxurious lounge with hospitality and business facilities available free-of-charge. At the arrival airport, business travellers can now expect preferential baggage service with their bags arriving on the baggage carousel first. There may also be an arrivals lounge allowing them to freshen up before going to their meeting.

All these advances in airport service do not come cheaply. They involve investment in extra staff and equipment, and in rental payments to the airport operator in respect of lounge space and extra check-in desks. It is essential therefore that airlines are able to raise their fares to pay for them or increase their share of the business travel market as a result of better airport service. It may be harder to sustain higher fares in a recessionary period, whilst increases in market share may only be transient if rival airlines also offer enhanced airport service.

In-Flight Service

Many of the points we need to discuss with regard to in-flight service have been made in earlier sections. Section 2:3:3 looked at the question of customer requirements in this area, and in this chapter, considered issues associated with classes-of-service decisions. There are, though, a number of additional aspects which will affect the nature of passengers' in-flight experience.

One of these areas is the question of an airline's fleet planning policies. Naturally, all aircraft manufacturers argue that selecting their aircraft will in turn allow airlines to give their customers a superior in-flight product. For example, Airbus claim that their A320 family is better than the B737 because it has a wider fuselage cross-section, allowing for wider seats and wider aisles. Equally, though, Boeing argues that its B767 is superior to the Airbus A330 and A340 because it is designed for 7-abreast rather than 8-abreast seating in the Economy cabin. Airbus replies that its A330 and A340 are optimised at 6-abreast seating in Business Class, in contrast to the 7 abreast of the B777. The latter therefore results in a 'prisoner', in the middle seat of three in the centre of the cabin.

For smaller aircraft, manufacturers of regional jets might argue that these aircraft bring significant benefits compared with turbo-props, at least over longer routes because they give a smoother flight, usually at higher altitudes, though these advantages are reduced with the latest generation of turboprops such as the Bombardier Dash 8-400. There are, of course, many costs associated with in-flight service. However, despite what they spend on items such as food, drink and in-flight entertainment, airlines find that the main costs are those associated with cabin staffing in terms of the salaries paid, the allowances given and the costs of hotel accommodation for flight attendants. The usual linking between the correct policy and airlines' overall business strategy applies.

For low-fare airlines, there might appear to be a temptation to dispense with cabin staff altogether. Because these airlines are generally "no-frills", the cabin service task is in any case a limited one. Such an option is not, though, a possibility. The primary function of cabin staff is that of ensuring safety on board, and regulatory bodies insist that a minimum number of qualified

cabin staff are carried. The rules are rather complicated, but in essence they mean that there must be one cabin attendant per 50 passengers up to 200, and one per 25 passengers over 200. A "no-frills" airline will, though, work with the minimum legal number of cabin staff as will a typical charter airline.

Scheduled carriers will generally have a greater number of cabin staff than the minimum, to ensure more attentive cabin service for First and Business Class travellers. Some airlines, especially from the Far East, will greatly exceed the minimum number. For example, a typical European or North American airline will budget for 14 or 15 cabin staff on a B747. Carriers such as Thai International use 22 on this same aircraft.

Whatever the number of cabin staff employed, a significantly greater issue for airlines – and their passengers – will be the attitudes displayed by cabin staff towards the passengers in their care. Warm, friendly and confident attitudes will constitute a major marketing advantage, whereas uncaring attitudes will be a serious handicap, especially amongst regular business travellers who will fly often enough to be able to compare the reception which they receive on different airlines.

Ensuring the right approach from cabin staff is one of the industry's intractable problems at the present time. Cabin crew are entitled to expect a career structure like everyone else and in highly unionized carriers in Europe and North America at least, trade unions have often been successful in negotiating this for them. However, there is then a risk that people stay in what is a difficult and exhausting job for too long, when cynicism has long ago replaced the initial enthusiasm that they may once have felt. Also, in recent years, at many airlines, cabin crew have seen their salaries and allowances reduced, as carriers have battled to restore profitability. Though such changes have often been a regrettable necessity, they have hardly helped to improve motivation and commitment.

CONTROLLING PRODUCT QUALITY

Quality control is an essential part of the product design phase of marketing for any airline. Without it, the carrier cannot know which parts of its product are weak, and where improvements are needed. Many aspects of the airline product can be quantified. For example, with point-of-sale service, modern telephone equipment can provide statistics on the proportion of calls answered within a given time period. It can also give information about the proportion of calls that are lost at busy times, in the sense that callers become tired of waiting for someone to help them and abandon the call.

Baggage service – or the lack of it – can also be quantified. The proportion of bags which are mishandled and fail to arrive at the destination at the same time as their owners is one necessary statistic. Also, baggage delivery times can be monitored by recording the time taken for the first bag and the last bag to reach the baggage delivery carousel.

Punctuality and regularity performance should also be studied carefully. The proportion of flights departing and arriving within prescribed limits of the scheduled time is a fundamental measure, with on-time to within 5 minutes a suitable standard for short-haul routes, and on-time

to within 15 minutes for long-haul. In terms of regularity (the proportion of flights advertised in the timetable which are actually operated), the standard should, of course, be near to 100%.

Monitoring of customer compliments and complaints should also be undertaken. All airlines receive fraudulent or unjustified complaints. Although these require vigilance, the number of them should be relatively constant. Therefore, comparing the number of customer compliments with the number of complaints will provide a first quality control statistic. Airlines should also investigate the nature of the complaints they receive. If these focus to an increasing degree on only a small number of product components, this will be a strong indicator of the areas where management attention is needed.

We have already discussed in Section 2:3:2 the use of in-flight and airport surveys as ways of collecting information about customer requirements. They can also form part of a quality control programme. An in-flight survey will have the advantage that passengers are actually experiencing the product at the time they fill in their questionnaire. If they are questioned at the airport of arrival their memories of the flight will still be fresh. In either case, asking passengers their opinions can have a valuable Customer Relations function, of convincing them that the airline is interested in continuous product improvement.

A further area of quality control work is one which should never be ignored – the opinions of the airline's own customer contact and sales staff. These people will regularly come into contact with customers and will have to listen to their complaints. Their reports can provide an accurate barometer of the airline's performance.

THE AIR FREIGHT PRODUCT

Airlines with an interest in penetrating the air freight market need to spend a great deal of time in detailed planning of the freight product. There are, of course, many differences between the air passenger and air cargo businesses which were set out in section 2:4:1. The basic principles of product planning are, though, exactly the same. Successful airlines will be those that identify correctly their customer's requirements and then make the difficult tradeoff between product quality and costs.

Air Freight Capacity

With questions of air freight capacity, we have discussed in Section 2:4:1 the advantages from the customer's point-of-view of an airline investing in pure freighter aircraft. These will allow capacity to be provided on the routings that the freight customer wants, at times which suit their demand pattern. They also offer a greater certainty that goods will actually be flown on the flight on which they are booked.

If it is decided that the provision of freighters will be worthwhile, a decision will have to be made about the type of aircraft to be selected. In deciding this, airlines will need to bring in some of the same considerations they will employ when selecting a passenger aircraft. For example, they will need information on the payload/range capabilities of the different aircraft types in comparison with their route networks and traffic flows. They will need data on capital and

ownership costs, fuel consumption, field-length performance and available operating costs. In addition, though, there are two pieces of data which are unique to freight operations and which can be crucial in plane choice. First, cabin door size and cabin cross-section of the main deck of the aircraft will decide what size of consignment can be accommodated. All narrow-bodied jet freighters (such as the freight version of the Boeing 757) can only accept consignments of up to 86 inches in height through their cargo doors. They cannot, therefore, accept the 8 feet by 8 feet rectangular cross-section of International Standards Organization (ISO) standard-sized containers. Of the wide-bodied aircraft, the freighter version of the MD-11 cannot accommodate two of these containers side-by-side in the main deck. The B747F and the A380F are the only freight aircraft at the moment which can do so. The 747F has the added advantage of a nose-loading capability, providing carriers are prepared to accept the higher capital and maintenance costs of an aircraft equipped with this facility.The second important performance measure for a freighter is its design density. Freighters do not only have a weight-limited payload. They also have a fixed volumetric capacity. If an aircraft only has a small volume relative to its maximum payload it will often become volumetrically full before its maximum payload is reached. Older narrow-bodied jets such as the B707 and DC-8 all had significant design density problems because of their inadequate cabin volumes. The Boeing 747 has a design density approximately 40% below that of the 707. This aircraft, though, has a very large payload/range potential so in practice it can only be used on the busiest long-haul services, as can the A380F.

The airline specializing in the air freight market will have to decide which types of freighter aircraft it is to employ. Total market airlines aiming to penetrate both the air passenger and air freight markets must decide whether or not they will use freighters at all. They need not do so. It is part of the synergy available to the total market airline that in providing passenger service it also produces lower-hold freight space. With narrow–bodied planes such as the B737, lower-hold capacity is not especially useful because these aircraft have belly-holds which are awkwardly-shaped and comparatively small. They can therefore carry only a small amount of freight, even when operating a flight where the passenger and baggage load is limited. The freight they do carry also poses time-consuming problems of loading and unloading. Wide-bodied aircraft, though, are much more capable. The B747 can carry 25 tones or more of containerized and palletized cargo in its lower hold. Other wide-bodies such as the A330, A340 and MD-11 have a freight capability of 12 tonnes or more, depending on the passenger payload and the fuel needed for a given sector.

Given that it will have large amounts of freight capacity available in its passenger aircraft, a total market airline operating wide-bodied planes can consider relying exclusively on lower-hold space. It will still be able to offer a good flight frequency, and it will not have to bear the heavy costs of operating a freighter fleet. Indeed, in the past an investment in freighters has rarely been a successful one for such airlines, especially in markets such as the North Atlantic where freight yields have generally been low.

Despite the attractions of not employing freighters, it is unlikely to be a viable option for an airline with a serious interest in the air freight market. To many customers, an exclusive reliance on belly-hold capacity will significantly reduce the quality of the product. For example, a shipper

of hazardous cargoes may need freighter service because industry safety rules forbid the carriage of many types of hazardous goods in the lower holds of passenger aircraft. Also, freighter capacity is very important to the shipper of large consignments. The main deck of the B747F, the largest freighter currently in common use, can accommodate shipments of over 100 inches in height.

A further problem with a freight product based only on belly-hold capacity is that it fails to take into account shipper's requirements for space. Air freight peaks strongly at night, following production during the working day, and at the end of the working week. There is a pronounced trough in demand on Sundays and Mondays. Some belly-hold capacity will therefore be provided at times of the day or the week when little freight is moving. At other times, though, there may be a chronic shortage of capacity, especially on Friday evenings.

In the longer term, a policy of relying purely on belly-holds may be untenable for another reason. It ties the amount of freight space offered to passenger demand. Generally, air freight demand is growing more quickly then that for passengers, in itself likely to lead to a shortage of belly-hold freight capacity. Also, passenger demand growth is generally faster in the leisure rather than the business travel segment. Leisure-orientated flights tend to be on routes to holiday resorts where the quantities of air freight moving may be relatively small.

A final factor jeopardizinga belly-holds only policy may be that in the longer-term, aircraft developments may mean that less space will be available for freight. The Airbus A380 is a double-decked aircraft in terms of its passenger cabins, in order to keep its overall dimensions within those necessary for airport compatibility. This means that a large increase in the passenger carrying capabilities of the aircraft, without corresponding growth in belly-hold space. Consequently, a greater proportion of the belly-hold capacity will be taken up with passengers' bags, and less will be available for freight.

Overall, airlines with a major interest in building their presence in the air freight market will have to operate a fleet of freighters. They may operate these aircraft themselves, or wet-lease them from specialists such as the US firm Atlasair. If they choose to operate the aircraft themselves, an attractive option may be to use conversions of obsolete passenger aircraft, rather than buy new and very expensive specialist freighters from the manufacturers. This will especially be the case if the passenger aircraft are comparatively new but have become obsolescent because of a lack of range. With freighters, shorter ranges are less of a problem because the aircraft can simply land and take on more fuel. Both Airbus and Boeing are offering freight conversion programmes for used aircraft, both as a way of providing a service to airlines and as a way of hopefully protecting the residual values of their older aircraft.

With questions of air freight capacity, there is an interim solution possible, with the use of so-called "Combi" and "Quick-Change" aircraft. A Combi is an aircraft where the main deck can be divided between passengers and freight with a moveable bulkhead to separate the two. A

Quick-Change (QC) aircraft is one which can be converted from a passenger to a freighter aircraft quickly – generally in less than an hour. This is because the seats can be removed in a short time as they are placed on pallets.

Both Combis and QCs are more expensive and heavier than equivalent passenger aircraft because they need a large cargo door and a strengthened floor. Theoretically, though, both can bring significant benefits. Combis have allowed routes to be opened up where there has been insufficient passenger demand to allow a service to begin at a marketable frequency. They have also permitted carriers to enter the large-shipment market without the risks associated with investing in pure freighters. QC aircraft have sometimes been valuable in short-haul operations. Here, passengers have not generally wished to travel at night, so aircraft have had to be left on the ground then, with a significant penalty in annual utilization. Converting the aircraft into a freighter allowed for extra, night-time flights to be operated.

Despite these advantages, Combi flying has declined recently whilst the QC concept has never achieved the popularity for which the aircraft manufacturers must have hoped. Combis have generally been unpopular with passengers, resulting as they do in a smaller-sized passenger cabin. Recent years have also seen the introduction of new fire suppression rules which have caused increases in both capital costs and aircraft weight. These in turn have challenged the economics of Combis.

With QC aircraft, these have generally been opposed by the passenger departments of airlines. Using an aircraft as a night-time freighter may mean that there will delays to early morning passenger flights if technical problems have occurred overnight. Also, in the past, QC aircraft have suffered from the way in which the nightly conversions have damaged aircraft interiors.

Besides questions of freight capacity, an airline hoping to penetrate the air freight market will have to make decisions about the ground handling systems to be employed, and the investment to be made in information technology.

In the late 1960s and early 1970s a number of airlines installed sophisticated on-airport automated freight handling systems. These were intended to allow them to lower their ground handling costs and to improve the service they offered to their customers. This early move to highly automated cargo handling was not successful, though, largely due to the unreliability and inflexibility of the systems.

During the later 1970s, many airlines discontinued automated on-airport handling and returned to labour-intensive methods. By this time, the advent of wide-bodied aircraft meant that more and more freight was loaded into aircraft in containerized or palletized form. As this trend developed, airlines found at least a short-term answer to their handling problems by offering concessionary rates to those air freight forwarders who were prepared to take the Unit Load Devices (ULDs), load them and present them to the airlines in a ready-for-carriage form. This process, operating under the so-called Bulk Unitization Programme, rescued airlines from otherwise intractable problems of on-airport cargo handling. It did, though greatly increase the number of expensive Unit Load Devices which they needed to purchase. The Programme also raised the bargaining

power of air freight forwarders relative to the airlines. It was therefore significant that during the 1980s and 1990s large integrated carriers such as FedEx, UPS and DHL grew rapidly. These firms adopted a policy of substantial investment in airport handling facilities, and largely chose to by-pass the forwarding industry. It is also the case that some airlines – British Airways and Air France are good examples – have now invested again in automated on-airport handling, despite having their fingers badly burnt in the industry's first move in this direction. They are relying on the fact that the state-of-the-art in cargo handling has advanced considerably since then.

The design of the freight product is an interesting aspect of airline marketing. The total market airline can use the synergies available from the belly-hold space in its passenger aircraft. It can therefore offer flight frequency and cheaply available capacity as its main advantages. The pure freight airline, on the other hand, can supply capacity which will meet the needs of the freight customer without any requirement for compromise. It is these advantages that are becoming increasingly important.

MODULE II

AIRLINE REVENUE MANAGEEMENT

INTRODUCTION TO AIRLINE REVENUE MANAGEMENT

FORECASTING DEMAND IN AIRLINE INDUSTRY

Every day, at all levels of management within all segments of the air transportation industry, decisions are made about what is likely to happen in the future. It has been said that business action taken today must be based on yesterday's plan and tomorrow's expectations. Call them expectations, predictions, projections—it all boils down to one thing, forecasting. Forecasting is the attempt to quantify demand in a future time period.

Quantification can be in terms of either dollars, such as revenue, or some physical volume, such as revenue passenger miles (RPMs) or passenger enplanements. Plans for the future cannot be made without forecasting demand. Planning also plays an important role in any aviation enterprise, but it should not be confused with forecasting. Forecasting is predicting, projecting, or estimating some future volume or financial situation—matters mostly outside of management's control. Planning, on the other hand, is concerned with setting objectives and goals and with developing alternative courses of action to reach them—matters generally within management's control.

A forecast of revenues is not a plan. There must be goals, strategies for attaining them, alternative courses of action, and a realistic fit with other market conditions. Thus, although forecasting is not planning, it is an indispensable part of planning, a management tool for deciding now what the company must do to realize its profit and other goals for the future.

Not only is forecasting done for a given type of demand independently, but forecasts of may one type of demand also be based on other forecasts. Thus, the projection of flying hours for next year is an element in the forecast of future demand for flight personnel, fuel consumption, facilities, and a host of other considerations.

The Purpose of Forecasting

Each type of forecast serves a particular purpose. Thus, an airline might make a short-term forecast of total passenger enplanements between a particular pair of cities to provide a basis for determining station personnel and ground equipment needed, gate availability, and expenses related to these items. Short-term forecasts normally span a period of one month to one year and cover such day-to-day operations as staffing stations, evaluating current competitive situations in the market, and projecting short-term equipment needs. Medium-term forecasts generally span a period of one to five years and involve such things as route-planning decisions. A long-term forecast spans a period of 5 to 10 years and might involve fleet planning decisions and long-term financial commitments. For example, a light-aircraft manufacturer might make a long-term forecast of demand for an aircraft specifically designed to serve the commuter air carrier market and then plan to meet the projected demand. The various forecasts are used by companies to carry out three important management functions—analysis, planning, and control.

A word of caution should be noted when forecasting. When obtaining statistical data, it is important to realize different sources have different reporting methods for the same outcome, meaning actual data might not be accurate. It is very important to use data from reputable sources and have a thorough understanding of how the data was collected especially when benchmarking against other sources. Analysis Every company must make choices among the many markets or submarkets open to it, in addition to deciding on the level of service to offer, the type of aircraft to fly on particular routes, and the type of aircraft to purchase. The choice is greatly facilitated by quantitative estimates of demand. The following situations demonstrate the role of forecasting in the analysis function:

A major air carrier is trying to decide whether to purchase the Boeing 787 or the A-350. An estimate of operating costs will be a guiding factor. A regional carrier is trying to decide whether to introduce shuttle service between two cities. The company will be guided by its market research department's estimate of long-term passenger enplanements.

A light-aircraft manufacturer is trying to decide whether to develop a new commuter aircraft. The company will be guided by an estimate of potential sales in this market.

Planning

Every firm must make short-term decisions about the allocation and scheduling of its limited resources over many competing uses; it must make long-term decisions about rates of expansion of capital equipment and funds. Both short-term and long-term decisions require quantitative estimates of demand, as the following situations illustrate:

A line maintenance supervisor for a national carrier in Dallas wants to identify how many workers will be employed for the next calendar year and needs an estimate of the number of departures at his station by month. The advertising director for a major carrier wants to promote a new low fare to selected cities and needs a short-term forecast of enplanements as a basis for assigning funds. The board of directors of a medium-size regional carrier needs a long-term forecast of population growth and business expansion in a particular city to use as a basis for planning future expansion.

Control

A company's actual performance (physical volume or revenues) in the market takes on meaning when it is compared to forecasts. A commercial aircraft manufacturer is disappointed with sales to national carriers. The market research department is asked to develop a new forecast of company sales potential in this market. A regional sales manager of a light-aircraft manufacturer wants to subdivide a sales territory in which sales are unusually high. The salesperson for that territory objects, arguing that the territory has only average sales potential but that she has penetrated the market to a greater degree than her counterparts have. The sales manager asks the research staff to come up with a sales forecast for the territory. The vice-president of flying for a major carrier asks the administrative staff to estimate the number of pilots who need to be trained

on the B-737 over the next three years because the former number appears to be too large in view of delays in delivery schedule since the original forecast.

Forecasting Methods

The choice of forecasting methods should be based on several factors, including availability of data, accuracy of available data, management sophistication, intended forecast use, and availability of electronic data processing. Sophistication in forecasting methods can easily run ahead of data quality and management ability to use the results. Forecasting passenger enplanements for a one-year period on well-established routes, for example, possess a fundamentally different forecasting problem than estimating enplanements on a new route, and forecasting methods must be chosen accordingly.1 Annual forecasts are provided by various organizations, such as the FAA, IATA, ICAO, aircraft manufacturers, and so on. The following review of forecasting methods is far from exhaustive, but it suggests the range of methods available.

Causal Methods

Causal (model) forecasts are based on a statistical relationship between the forecasted (dependent) variable and one or more explanatory (independent) variables. There need not be a cause-and-effect relationship between the dependent and the independent variables. A statistical correlation alone is sufficient basis for prediction or forecasting. Correlation is a pattern or relationship between the two or more variables. The closer the relationship, the greater the degree of correlation.

In general, a causal model is constructed by finding variables that explain, statistically, the changes in the variable to be forecast. Such variables must have the following characteristics: (1) they must be related statistically to the dependent variable, (2) data on them must be available, and (3) there must be some way of forecasting them, or their relationship to the dependent variable must be lagged (must follow the dependent variable by several months).

Most forecasting methods are based on the assumption that existing patterns and historical relationships will continue in the future. Because this assumption usually holds only for the short term, however, most forecasting methods can provide reasonably accurate forecasts for periods of only one or two years. In the case of aviation, the events of 9/11 led the industry into a very unpredictable era. Historical data once used for forecasting no longer has the same credibility because, essentially, the industry has started over.The statistical relationship is estimated and verified using statistical analysis. The selection of variables depends on the imagination and resources of the researcher. With the aid of a computer, dozens of candidates can be tested, easily and quickly, once the structure—that is, the mathematical form—of the model has been decided. This, too, may be selected by trial and error.

The availability of data on the variables—or, more specifically, their specific values— is largely determined by the time and resources the researcher has available. Data are the key to specifying the model. Prominent independent variables used in forecasting various segments of the air

transportation industry include gross national product (GNP), disposable personal income (DI), and consumer spending on services. Dependent (forecasted) variables might include such things as revenue passengers enplaned, RPMs, and passenger revenues. In the general aviation sector, the level of corporate profiits in the economy as a whole correlates well with total business aircraft purchases. Some very sophisticated mathematical models might use 20 or 30 independent variables to forecast a particular set of dependent variables.

For example, let's say we developed the following hypothetical formula, using statistical analysis and based on data covering a 15-year period, that shows the relationship between GNP and the number of active general aviation aircraft in the India:

Y = 8.14 + 0.152X.

The value of the GNP (X in the equation) is expressed in billions of current dollars, and the resulting estimate of the fleet (Y in the equation), is in thousands of active aircraft. Figure 8-1 demonstrates the closeness of the fit between the forecast model and the observed historical data over a 15-year period.

Once the formula has been established and a high correlation demonstrated, the equation can be used for forecasting purposes. The next step is to obtain current forecasts of the independent variable (GNP in this case). The FAA aviation forecast uses economic forecasts from Chase Econometrics; Data Resources, Inc.; Evans Economics, Inc.; and Wharton Econometric Associates.2 These are all highly reputable sources for forecasting major economic aggregates. The forecasted active general aviation aircraft fleet is then determined by plugging in the values for the forecasted GNP over the time period being forecast.

Given unlimited amounts of data, causal models can be constructed that explain almost any market phenomenon. Unfortunately, unlimited amounts of data are rarely available. Shortages of time, money, and personnel; limits on the accessibility of data; deficiencies in measurement techniques—all impose serious constraints on data availability. Often, researchers must be content with secondary data, substitute variables, outdated observations, and inaccurate information. The result is usually an imperfect model, although not necessarily a useless one.

Forecast ability, or a lagged relationship with the dependent variable, is essential, because it does little good to construct a forecasting model if the future values of the explanatory variables are as difficult to estimate as those of the dependent variable. The only alternative is to use independent variables whose present values determine the dependent variable's future values.

Causal models are unquestionably the most sophisticated type of forecasting method used today, as well as the most frequently used. However, as mentioned previously, companies use these forecasted data in developing forecasts of their share of the industry (forecasts used for other forecasts). Although causal models are used quite extensively by the FAA, ATA, GAMA, NBAA, and other industry sources, it is important to recognize their limitations:

No one during the mid-1960s boom period in aviation foresaw the magnitude of the recession that occurred in late 1969 and extended through 1972. All indicators pointed to continued

expansion throughout the 1970s. Jumbo jets were ordered based on the mid-1960s forecasts; a major airport expansion program was undertaken; and manufacturers in both commercial and general aviation geared up for a major expansion. And then the bottom fell out. Despite its inadequacies, the science of model building for forecasting purposes has grown increasingly more sophisticated over the past 20 years as a result of the use of computers. Nevertheless, unusual weather conditions, international tensions, labor–management troubles, and a host of other unforeseen factors can disturb an established relationship between variables.

Time-Series or Trend Analysis Methods

Another reasonably sophisticated statistical method of forecasting is time-series analysis, the oldest, and in many cases still the most widely used, method of forecasting air transportation demand. In some situations, this method is referred to as trend extension. It differs from causal model forecasting in that less causation is embodied in the time series.

Time-series models show the dependent variable as a function of a single independent variable, time. This method is used quite frequently when both time and data are limited, such as in forecasting a single variable (for example, cargo tonnage) for which historical data are obtained. Like the causal models, time-series models are based on a statistical correlation that does not necessarily reflect a real cause-and-effect relationship between the dependent and the independent variable.

Aviation is certainly not static: new-aircraft sales, prices, revenue passenger miles, cargo tonnage, profits, flying hours, on-time performance, and number of departures all flluctuate over time. Time-series or trend analysis is simply a sequence of values expressed at regular recurring periods of time. It is possible from these time-series studies to detect regular movements that are likely to recur and thus can be used as a means of predicting future events.

Forecasting by time-series or trend extension actually consists of interpreting the historical sequence and applying the interpretation to the immediate future. It assumes that the past rate of growth or change will continue. Historical data are plotted on a graph, and a trend line is established. Frequently, a straight line, following the trend line, is drawn for the future. However, if certain known factors indicate that the rate will increase in the future, the line may be curved upward. As a general rule, there may be several future projections, depending on the length of the historical period studied. Airlines keep numerous records of data of particular concern to them (departures, enplanements, flying hours, and so forth), and when a forecast is needed, a trend line is established and then projected out to some future time. The accuracy of forecasting by historical sequence in time-series or trend analysis depends on predictions of changing factors that may keep history from repeating itself.

The values for the forecasted (dependent) variable are determined by four time-related factors: (1) long-term trends, such as market growth caused by increases in population; (2) cyclical variations, such as those caused by the business cycle; (3) seasonal phenomena, such as weather or holidays; and (4) irregular or unique phenomena, such as strikes, wars, and natural disasters. These four factors induce the following types of behavior in the dependent variable: (1) trends,

(2) cyclical variations, (3) seasonal changes, and (4) irregular fluctuations. These types of variations are found throughout the literature of market and economic forecasting. An example of each is given in Figure 8-2, along with a composite they might produce.

Trends. A trend is a long-term tendency to change with time. A variable's trend is a reflection of its statistical relationship with time, exclusive of cyclical, seasonal, and irregular disturbances. Trend functions are described by growth curves, which express, both graphically and mathematically, the underlying pattern of time-related changes. This pattern is usually brought about by such factors as population, GNP, industrialization, changes in technology, and long-term shifts in tastes or preferences. A trend can be inherently positive, such as total air carrier passenger revenues. It can be negative, such as the phasing out of fuel inefficient aircraft from the airline fleet. Or it can be erratic, as in the case of airline pricing in recent years.

The time period specified for a particular trend varies considerably. Economists frequently define it as any period in excess of that required for a complete business cycle (approximately five years). Airline marketers tend to specify a trend period as equivalent to the approximate lifetime of the service. This can vary from a few months (in the case of some in-flight promotional services, such as two-for-one drinks or special meal service) to a couple of years (for such items as an advertising theme) to an indefinite period (for an essential, such as fuel).

Cyclical Variations. Cyclical variation is the variation of the forecast variable due to the business cycle. The business cycle is the wavelike fluctuation in the level of economic activity that has been associated with the economies of the developed nations since the early years of the Industrial Revolution. The business cycle has never been fully explained by economists, adequately controlled by governments, or satisfactorily predicted by businesses. However, the phenomenon is apparent if any of the common economic indicators (such as GNP, employment levels, stock prices, corporate profits, or capital investment) are plotted over time. The length of individual cycles varies, although they usually last well beyond a couple of years measured from peak to peak or valley to valley. In the United States, cycles range from 1 to 10 years, with 4 or 5 years the norm. The magnitude of the fluctuations, measured vertically from peak to valley (or vice-versa) varies tremendously and thus far has defied precise forecasting, to the chagrin of most aviation industry analysts.

The business cycle has a significant effect on all segments of the air transportation industry. The level of air travel for business or pleasure purposes is affected by upturns and downturns in the economy. Economists refer to the air transportation industry as being income elastic; that is, airplane sales, RPMs, and so forth are very responsive to changes in economic aggregates such as disposable income, personal income, and national income.

Seasonal Variations. Seasonal variation is the variation of the forecast variable associated with the time of year. It is appropriately named, for it is a function of both the weather and the social customs associated with the four seasons (for example, in Florida, the heavy tourist season from Thanksgiving through January 1 or college spring break from March through April). Seasonal fluctuations in the demand for such things as motel rooms, rental cars, and airline travel are quite pronounced.

*Irregular Variations.*Irregular variations are erratic, non-recurrent events such as strikes (for example, the air traffic controllers' strike in 1981), blizzards, riots, fires, wars or war scares, price wars, bankruptcies, and other real-world disturbances. Although the disturbance factor is easily identified and the magnitude of its effect can normally be estimated, it seldom can be forecast.

Smoothing the Variations

Cyclical Variations. Cyclical variations can be removed by the forecaster by performing a couple of tasks. The first, and most difficult, task is to estimate the relationship between the forecast variable and the business cycle. The forecaster selects an appropriate index, such as GNP or the Dow Jones stock average, to represent the business cycle. Then, either subjectively or through various mathematical approaches, the forecaster estimates the elasticity (responsiveness) of the forecast variable with respect to the business cycle index. The objective is to determine how much of the fluctuation in the variable was induced by the business cycle. For example, if the index drops 10 percent, how much will the forecast variable change? Once this is determined, the observations of the forecast variable—the values (volumes or financial data) that make up the composite curve—can be adjusted.

The forecaster then simply subtracts the cyclical variation, computed for each point in time, from each observation. What remains is a time series or trend line free of cyclical variation. An alternative is to leave the cyclical variation in the data. However, the result is a forecast that reflects the cycle. Depending on the purpose of the forecast, this might, in fact, be the more realistic approach, in that it reflects the uncertainty induced by the business cycle.

Seasonal Variations. The primary reason for removing seasonal variations is to refllect the actual situation more accurately. For example, if Easter week falls in late March one year and in early April the next, increased passenger enplanements, RPMs, revenues, and so forth will appear in the first-quarter statistics one year and in the second-quarter statistics the next year. Unless this is taken into consideration in the forecast, planning for the two quarters will be inaccurate.Seasonal variation is eliminated by a process called smoothing. The most common instruments for this purpose are freehand lines, semi-averages, and moving averages. Freehand lines are a convenient way of smoothing out fluctuations in data, but they are obviously imprecise. Using semi-averages to smooth out a curve is only slightly more rigorous than using freehand lines. The forecaster simply divides the time series into two equal parts—its fiirst and second halves—and then computes the arithmetic mean (average) of each part. The two means are plotted and a straight line is drawn through the two points to represent the smoothed curve. This line can be expressed mathematically, but the function cannot be evaluated by statistical testing. The moving average is computed by finding the mean of the adjoining observations.

This average then replaces the observations used in its calculation. A 12-month moving average would drop the observed data for the first month in the time series when data become available for a new month in the series. The correct number of periods used for a moving average depends on the length of the seasonal cycle and the frequency of the observations. Most seasonal

variations have a one-year cycle. If monthly observations are recorded, then a 12-period moving average will remove seasonal variation.

Irregular Variations. Irregular variations are introduced by a major event such as severe weather conditions or a strike and can usually be identified and measured, or at least estimated, with reasonable accuracy. Either an adjustment can be made in the observed values or the observations taken during the event can be deleted. For example, an evaluation of the long-term trend in passenger enplanements, load factors, and the like would take into consideration the air traffic controllers' strike during the summer of 1981, when service was cut drastically for a period of time.

When forecasters make adjustments or deletions, they should note the fact. Management should be made aware of the effect of these events and the probability of their recurrence. When the effects are severe, such as abnormally harsh weather over several years, and there is a possibility that they will recur, management can sometimes make provisions for them. The usual order of removing unwanted variation is to remove first fluctuations caused by irregular events, then cyclical variation, and finally seasonal variation. The residual is a true trend. These data can then be plotted and an appropriate curve drawn through, or fitted to, the actual points (scatter points) in what is referred to as a line of best fit.

Accuracy of the Causal Models and Time-Series Forecasts

Short-term forecasts are generally more accurate than long-term forecasts because the underlying determinants and the relationships between variables tend to change less in the short run than in the long run. However, short-term forecasts are vulnerable to seasonal variations that, if unaccounted for, can make them unrealistic.

A long-term model is really a trend model, affected only by irregular variations.

Developing a trend model is generally the primary objective of the forecaster, because management is interested primarily in the growth or contraction of a particular service.

Forecasts for the economy as a whole usually are more accurate than those for a particular industry within the economy. Consequently, forecasted revenue for the airline industry typically is not as accurate as forecasted GNP. Likewise, an individual company's forecasted share of the industry total usually is less accurate than that of the industry as a whole. And, going one step farther, a general aviation aircraft manufacturer's forecast of revenue for a particular model of aircraft generally is less accurate than a forecast for a category of aircraft, such as turboprop aircraft. The reasons for this are basically twofold: (1) the numbers become smaller and less statistically reliable as the forecast becomes more finite, and (2) the number of variables increases as the forecast becomes more finite.

Judgmental Methods

Judgmental forecasts are educated guesses based on intuition and subjective evaluations. Although they are the least rigorous types of forecasts, they are frequently a powerful factor in

decision making. Intuition often is the only tool the researcher has, and it can be very accurate. Judgmental methods can be used when either no information or very little historical data exist. They can also be used to adjust forecasts developed by causal models or through time-series analysis. For example, the preface to FAA Aviation Forecasts, 2001– 2012, states that "FAA aviation forecasts employ projections of key economic variables. These projections are combined with projections of aviation variables and professional judgment."

Acceptance or rejection of a judgmental forecast depends mostly on the reputation of the forecaster, because there are no statistical ways to evaluate it. Very often, a strong leader can push through recommendations based on such forecasts. For example, a vice-president at Cessna felt strongly that there was a significant unexploited demand for a twin-engine airplane with its engines mounted in tandem instead of laterally, as in conventional designs. (This would prevent asymmetric, or out-of-balance, thrust, thereby reducing the hazards of flying with one engine out.) Although his judgment conflicted with forecasts made by more rigorous methods, the company committed itself to the idea. When the product was introduced, sales fell far short of the level the vice-president projected. Instead of backing down, however, the executive insisted that his analysis of demand, and hence of potential sales, was correct and that the fault lay in the design of the aircraft. He won his point, and the model was not dropped. An alteration in the design (the incorporation of retractable landing gear) made the product acceptable to the market, and sales rose to the level he forecast. The model became, for a time, the most successful product in the firm's line.

As was the case with the Cessna example, judgmental forecasts usually require the backing of a leader because, in the absence of supporting data and objective analysis, they seldom can stand on their own. They are based on experience and partial (usually qualitative) knowledge; their analytical tools are intuition and common sense. They are frequently poorly received, especially when they suggest a future that is substantially different from the present or involve a radically different product or promotional scheme. Aviation is filed with examples—Bill Lear when he first proposed a business jet, or whoever first suggested serving liquor aboard commercial airliners (the president of United Airlines at the time was quoted as saying something to the effect of, "No way, we're not going to become flying taverns").

Judgmental forecasts can be obtained from a number of sources, including expert opinion, sales force opinion, and polls.

Expert Opinion. Expert opinion can come from within or outside the company. Forecasts may be developed by simply drawing on managerial experience within the company. For example, a prediction of next year's cargo tonnage may be obtained from the vice-president of cargo sales. Companies can also tap outside experts for assessments of future market conditions. Various public and private agencies issue or sell periodic forecasts of short- or long-term business conditions for different industries. Leading spokespersons, sometimes referred to as "visionaries," from banking or investment houses report on the status of and outlook for the industry.

An interesting variant of the expert opinion method is used by Lockheed. As a manufacturer of airframes and missiles, the company deals with a relatively small number of customers, each of which accounts for a relatively large percentage of sales.

Therefore, Lockheed's forecasting problem is to predict what each particular customer will order during the forecast period. The market research group works up a preliminary forecast on the basis of surveys and causal models. Independently, various Lockheed executives pose as major customers and, in a hardheaded way, evaluate Lockheed's offering in relation to its competitors' offerings. A decision on what and where to buy is made for each customer. The purchases from Lockheed are totaled and reconciled with the statistical forecast to form Lockheed's sales forecast.

The use of expert opinion has several advantages and disadvantages. The primary advantages are that (1) the forecasts can be made relatively quickly and cheaply, (2) different points of view can be brought out and balanced in the process, and (3) there may be no alternative if historical data are sparse or unavailable, as in the case of new products or services. The primary disadvantages are that (1) opinions are generally less satisfactory than facts, (2) responsibility for the forecast is dispersed if various managers' opinions are used and if good and bad estimates are given equal weight, and (3) the method is usually more reliable for aggregate forecasting than for breakdowns by region, customer groups, or service categories.

Sales Force Opinion. Sales force estimates have the advantage of coming from those individuals who are closest to the marketplace. Because they work in the fiield, salespeople generally have a fairly good idea of their company's image with travel agents in their territory and the expected business to be generated from these sources. They also have a good feel for the amount of cargo tonnage shipped by freight forwarders and businesses that have been using their services. They are in daily contact with the carrier's major customers and can offer valuable information to the home-offiice forecaster. Sales representatives are often the fiirst to learn of a competitor's strategy at the local level and may have more knowledge of or better insight into developing trends than any other single group. This grass-roots approach to forecasting can be helpful in breaking down sales by territory, customer, and sales force.

However, forecasting by the sales force is not without its problems. A salesperson's forecast can be biased, and individual salespeople may be overly pessimistic or may go from one extreme to another because of recent revenue setbacks or successes. Also, a salesperson is often unaware of larger economic developments and of company marketing plans that will shape future sales. Consequently, few companies use the salesperson's estimates without some adjustments.

Poll Forecasts. Poll forecasts are based on the expressed intentions of members of the particular target market, who are polled using one of the conventional survey techniques— mail questionnaires or telephone or personal interviews. A poll is a collection of judgmental forecasts from the market sampled in the survey.

Poll forecasts are susceptible to a number of errors, including poor judgment, ignorance, and uncertainty among the respondents. The respondents' judgment, especially with respect to future

events such as purchase behavior, can be quite suspect. Further, the respondents may not be the ultimate decision makers regarding the product in question, and plans may change because of company circumstances and general economic conditions.

In the case of polls or surveys of potential business aircraft purchasers, there may be a reluctance to disclose buying intentions. Such a request could be regarded as an invasion of company privacy. Nevertheless, polls are used quite extensively by all aviation fiirms as a means of developing data for designing new products and services, as well as for forecasting purposes. Polls, if properly designed and used, provide useful estimates about the target market.

Usefulness of Judgmental Methods

The usefulness of expert opinion, sales force opinion, or polls depends on the cost, availability, and reliability of these types of data. For cases in which buyers do not plan their purchases carefully or are very erratic in carrying out their intentions, or in which experts or the sales force are not particularly good guessers, a poll or survey of buyers' intentions is preferable. A poll or survey also is generally more desirable in forecasting the market for a new product or for an established product or service in a new territory. When a short-term forecast of likely buyer response is desired, an expert opinion may be called for.

DEREGULATION OF THE AIRLINE INDUSTRY

The deregulated airline industry abounds with paradoxes. The number of airlines has Theshrunk by more than half. But the degree of competition among carriers has, if anything increased.

There are significant fare benefits to consumers.Yet, consumers find the complexity of fare structures a nuisance.People talk as if they want more frills (less crowding, better meals, larger seats), yet when given those choices, they have picked the lower-priced services with the fewer frills. Indeed, if service is measured in flight frequency, consumers have gained even more in the service dimension than in the price dimension since deregulation.

Carriers have profoundly changed their core capabilitiesin operations, in information systems, in marketing, and in pricing. Yet, to the traveler, a trip often seems pretty much the same today as it was fifteen years ago.Most paradoxical of all is that while U.S. consumers seem discontent, people in the rest of the world view our air system with envy. Its strength has provided great benefits at home and is forcing major market adjustments among international carriers everywhere.

The New Core Capabilities

Hub-and-Spoke Route Systems: Deregulation freed up firms to focus on their own markets and operations. That focus produced new core operating capabilities. The old regulatory route regimewas designed along railroad tracks, with initial route awards granted on linear east-west or north-south corridors. The route regime that has emerged under deregulation also has logic to it, but it is a logic derived from optimal flows in networks rather than from governmentally imposed linear systems. Operations research analysis showed that, if unconstrained by

regulation, a hub-and-spoke delivery system was superior to a linear system. Consumers would be better off in terms of travel convenience and frequency of flights. Firms would be more efficient and would enjoy reduced delivery costs.The hub-and-spoke delivery system has become the new standardized operating system for air-lines. It has three central features. First, there are cost savings to airlines from better capacity utilization. Load factors are now in the low to mid-sixties, up from a level in the low to mid-fifties before deregulation. Second, there is greater concentration at the hub airport; one carrier tends to dominate operations by controlling 70 percent or more of incoming and departing flights. Hub concentration is believed to confer a degree of local market power on the serving carrier. A third feature is that more destinations are served nonstop from each hub. Several waves of incoming and departing flights occur each day. That greatly increases the number of sources and destinations between which passengers can flow with at most one inter-mediate stop.

Elizabeth E. Bailey is the John C. Hower Professor of Public Policy and Management at the Wharton School of the University of Pennsylvania.The benefits of the new operating design to consumers are measured in a growth in weekly flights of 60 to 70 percent for large and medium cities and of 35 to 45 percent for small cities and rural or small communities. There is a benefit as well in the increase in city-pair competition (less than 50 percent of enplanements today take place on routes where a single carrier accounts for half or more of the passengers, compared with the 70 percent under regulation). One cost to consumers is somewhat higher prices that are paid in more concentrated hubs. Another cost of the new opera-ting design is an increase in crowding and delays, particularly at the height of each wave of activity.

Computer Reservations and Yield Management Systems: Advances in computer technology, particularly with respect to the reservations systems, have expanded the industry's core capabilities. The computer reservations technology can be traced back to 1967, when American con-ducted an experiment in retail distribution by placing terminals in a small number of high-volume travel agencies. As late as 1976, American had installed its SABRE system in less than 150 travel agency offices. The systems were primitive compared with today's; they provided flight information and made reservations only for participating airlines. Today's systems quote fares, allow seat selection, and issue boarding passes and also provide car rental information and enable travelers to make hotel reservations. As system owners made greater investments in those systems and as computerized capabilities grew at an astounding rate, the systems revolutionized the face of air travel in the United States.

Only a few airlines provide these systems. The two largest systems, SABRE and APOLLO have a combined market share of 65 percent. SABRE has more than a 40 percent share of U.S. travel agents; APOLLO (United, now with significant foreign participation, as well as USAir) has nearly a 25 percent share. WORLDSPAN (Delta, Northwest, and TWA) and SYSTEM 1 (Continental) are the only other players, and their share is dropping. These systems provide economic rents to their carrier owners, but they also greatly improve service convenience for passengers. One such convenience, not included in most performance measures, is that passengers no longer have to wait in line for a half hour or more to get boarding passes at airports.

Strategic developments in pricing have also been made possible by computer hardware and software advances. Economists expected simple peak and off-peak pricing schemes. But such schemes can be driven out of the market by the more sophisticated yield management systems (price discrimination) that firms have produced. A pioneer in yield management systems, American had some 540,000 published fares before its recent effort to simplify fare structures. And those fares did not include numerous special deals. The intricate fare structure is driven by different supply and demand characteristics, such as the number of carriers serving the market and the mix of business and leisure travelers. Many restrictions apply, such as advance purchase requirements, non-refund ability provisions for many low fares, and Saturday night stays. Competition in price is so fierce that it is estimated that there are roughly

80,000 airline fare changes each day: The deregulated marketplace also enabled the industry to develop creative marketing schemes. After deregulation, a riot of new ideas flowered, most of which have been aimed at inducing brand loyalty. American introduced the frequent-flier program in 1981; within five years all airlines had adopted such programs. The program gives the traveler a free ticket after he has accumulated a certain number of miles on a particular airline (often 20,000 miles). Thus, the consumer, in making today's travel choice, will pick the airline that is his most likely choice for future travel. That airline is often the one with strong control at the originating hub airport in the consumer's neighborhood.

Airlines that own computer reservations systems enjoy other strategic advantages. For exam-ple, they can offer override commissions to travel agents who steer a sufficient volume of traffic toward them. Override commission programs involve a contract between the airline and a travel agent in which the airline agrees to increase the agent's commission rate if the agent reaches specified sales goals. Just as consumers have incentives to concentrate travel on one particular airline because of the frequent-flier programs, so travel agents have incentives to concentrate bookings on particular airlines because of the override com-missions they are offered.

Thus, the new operating, pricing, and marketing methods increase the focus on and rewards from the hub-and-spoke networks. Airline deregulation has enabled managers to enhance the role played by operations and production. Deregulation has also allowed managers to capitalize on innovations in pricing, marketing, and sales made possible by computer technology. Recently, it has been contended that deregulation has been responsible for freeing managers in a number of industries to discover new industry capabilities that enable the best managed firms to build market share.

Deregulation is also widely believed to have been responsible for the sharp decline in the number of carriers through merger, acquisition, and bankruptcy. But deregulation may not have been the major cause. To understand how the new dominant designs the hub-and-spoke delivery system and the computerized reservations and yield management systems affect market structure, it is useful to consider the history of market structures in other industries.

Researchers at the Massachusetts Institute of Technology have studied industry after industry, from the typewriter industry in the early 1900s to the electronic calculator industry of today. They find that there is typically a proliferation of firms during the period before standardization

that is followed by rapid consolidation. Thus, the number of typewriter firms grew from about ten in 1893 to over thirty by 1896. After Hess's innovations and the dominant design of Underwood's model 5 in 1906, the number of firms shrank to a handful over the next two decades. Similarly, after the dominant design of the all-steel, closed body for the automobile was introduced in 1923, the number of firms participating in the industry dropped from eighty to less than twenty two decades later. The data on survival suggest that the probability of survival after the introduction of a dominant design is less than 50 percent over the next twenty years and less than 25 percent for as long as thirty years.

The airline industry would seem to fit into that pattern. The perception that structural change has been atypically great in the industry may be a result of its greater visibility. We are less aware of significant structural change in less visible industries, such as the typewriter or TV tube industry.

Industry Structure and Corporate Control

Bankruptcy and Exit: The market for corporate control of the airlines has been active since deregulation. The past fifteen years produced waves of bankruptcies, exits, mergers, and restructurings. And the market for corporate control has not yet equilibrated. Three of the remaining nine major players are in bankruptcy. And most of the U.S. airlines are now engaged in a fierce battle for control that transcends national boundaries. The international marketplace is now facing the realities of the new operating environment.

Consider the factors leading to the three most dramatic exits those of Pan Am, Braniff, and Eastern. Pan Am was the pioneer of international aviation. In the regulatory era it had been awarded worldwide routes, but no domestic routes. Shortly after deregulation, it proceeded to rectify the situation by purchasing National Airlines. National seemed a good fit with its Miami location and offered a route network that naturally drew planes into the Pan Am hub at Kennedy Airport.

Pan Am failed at that merger, not because it lacked foresight or resources but because it poorly executed the merger. Pan Am's expertise was in delivering international operations where customers readily tolerated delays of an hour or more. It was unable to deliver a competitive degree of on-time performance when compared with domestic services of other U.S. carriers. It was unable to integrate its systems and its work forces effectively or to reequip and modernize its fleet. In the last decade of its operations, Pan Am lost more than $2 billion. It survived by selling off assets-the

Pan Am Building in New York, the Intercontinental Hotel chain, land in Tokyo, and its routes to Japan and London. Once those were gone, the airline itself disappeared.

A similar explanation can be provided for the other instances of bankruptcy and eventual exit (see Table 1). The first bankruptcy, that of Braniff, came about because of a decision by its then chief executive officer, Harding Lawrence, to expand operations rapidly on a newly opened set of domestic and international routes. Operations on the new routes began with little advanced marketing or training of personnel. Lawrence believed that deregulation would be retracted and

that Braniff would retain its new routes. When deregulation was codified into law, Braniff found itself with huge cash needs for operations (for example, for fuel) but insufficient cash flow (few customers). Again, its market failure stemmed from poor management strategy and execution.

Eastern's Chapter 11 filing and eventual exit followed a history of poor management practices-from uneconomic decisions on fleet at the time of Eddie Richen bacher to poor labor relations that haunted its last years of operations. Airlines such as TWA and Continental, which piled on debt in the late 1980s, have also found those decisions to be costly and have in turn been forced into Chapter 11.

The poor management performance has also been reflected in pay statistics. Under regulation there was no significant relationship between CEO pay and performance. Indeed, managers who performed poorly tended to receive higher pay. After deregulation, a statistically significant relation-ship has emerged that disciplined poor performers through lower real compensation. At Braniff, for example, the average annual CEO pay was $651,170 from 1971 to 1977; that was reduced to $262,018 in the period after deregulation, 1979 to 1984. In contrast, average CEO pay at Southwest Airlines rose from $249,161 to $498,941 over the same periods.

The marketplace is supposed to punish poor management, and it has done so in the aviation industry. Consumers remember the drama. They tend not to remember that the transition was smooth. The planes kept flying. Communities con-tinucd to be served. The reality has been that the failure of firms means that markets are working.

Growth and Merger: Contrast those failures in performance with some of the success stories.American provides a particularly apt example. In the years immediately following deregulation, American too found itself with a fleet of older aircraft, and it too had a profitability problem. In 1980 American took a number of steps to prepare itself for the new, more competitive environment. It retired its 707s and began a phase-out of its 727-100s so that it reduced its capacity. In addition, management cut overhead costs by reducing the number of employees from 41,000 to 36,000. American also restructured its route system to build its hub-and-spoke connecting complexes and directed 79 percent of all traffic to Dallas/Ft.

Worth, where it relocated its headquarters: Connecting flights to sunbelt growth areas replaced linear routes assigned under regulation. American also instituted new marketing and pricing strategies, including the frequent-flier programa new concept involving wider spreads for discount (Supersaver) faresand increased investment in its SABRE computer reservations system. American's new president, Robert Crandall, understood the implications of deregulation. He altered his methods of management down to detailed functional levels in his firm to prepare it for competitive success in the years ahead. Between 1976 and 1983, his firm trebled in market value to shareholders, and its market share and value have continued to grow.

Other large carriers got a slower start but also managed the adjustment. One of the last mergers was that of Delta with Western, but the well-regarded Delta management was able to minimize the array of operational and personnel problems associated with such mergers. United faltered in the earliest years in its strategic decisions and has had less success with labor relations than have

American and Delta. Nevertheless, it was the first among the big three domestic carriers to see the logical push toward globalization.

The push to fewer and more global carriers comes from both the supply side and the demand side. High concentration is a natural result of the interaction between carriers' cost structures (efficiency) and passengers' schedule preferences (convenience). Passengers have contributed to the current structure through their choices. They have preferred low-frills service to upscale service. Their choice is evident from the failures of airlines attempting to offer first-class service at coach fares at St. Louis and Chicago. The choice is also evident from Southwest's success with its low-cost, point-to-point, turnaround services.

Consumers prefer to deal with a single carrier rather than to switch carriers. They believe that with a single carrier they face fewer hassles lost baggage, missed connections, and poorly timed connectionsassociated with transferring from one carrier to another. Shortly after deregulation, the local carriers used their new route choice flexibility to initiate long-haul spokes from the hub cities endowed to them under regulation. Passengers remained on those carriers, despite their reputations. (USAir was called "Useless Air.") Such carriers had no first-class scats and an older, less attractive fleet. Yet, profits of the local service carriers from 1978 to 1984 were at financially healthy levels. The trunk carriers, on the other hand, found that offering only long-haul routes was a financial fiasco. Customers would not switch to them despite the amenities they offered. So to strengthen their own viability, the trunk carriers integrated backwards to capture the feeder net-works that would give them a customer base on which they could rely. The disappearance of local service carriers has enhanced the economies of scope of their larger trunk rivals. Overall, the pro-portion of trips involving a change of plane has fallen from just over 11 percent in 1978 to just over 1 percent in 1990.

Economists have been critical of the antitrust policy that permitted some airline mergers, such as those of TWA and Ozark (which share the St. Louis hub) and that of Northwest and Republic (which share the Minneapolis hub). A significant amount of literature has analyzed the effects of those mergers. But, even had government officials vetoed those mergers, there would have been failures (exits) due to poor financial performance, as for example, in the case of Ozark. Moreover, new economic studies of substitute product competition suggest that in situations where price can be varied at will, but changes in operations are not costless, there is a tendency for the number of firms to shrink toward a lower bound, and that firms with higher quality (greater scope of operation) will tend to dominate.

Globalization. More and more, consumers want the same single-carrier service they use domestically to take them to foreign cities. The consolidation movement evident on the U.S. scene in the 1980s is replaying itself on the international scene in the 1990s. The robust expansion of the deregulated airline industry in the United States has repercussions for foreign competition. Larger foreign carriers are buying into smaller carriers, for example, Air France into Sabena and SAS into

Swissair and Austrian Airlines. Foreign-carrier groups increasingly coordinate flights into each others' hubs and purchase each others' equity. At the same time the privatization of foreign

carriers (such as British Air and Japan Airlines) enables them to compete more efficiently. The fascinating tale of the replacement of TWA and Pan Am by United and American at London's Heathrow Airport highlights the increasing strength of U.S. carriers abroad. The British, particularly British Airways, fiercely resisted replacing the U.S. carriers at that airport, precisely because they recognized the greater competitive strength of American and United vis-à-vis Pan Am and TWA. International air service is not an area in which the United States is losing to Europe or Japan. By 1990 American and United had exceeded British Airways, the Air France Group, Lufthansa, and Japan Airlines in terms of rank by revenues. The United States has begun to put its best management forward. That is forcing major efficiency improvements around the world. It is also putting downward pressure on world price levels. A comparison of yieldthe average dollars charged per revenue passenger mileachieved domestically versus internationally shows that for every lengthof haul U.S. prices are lower. The longer the length of haul, the more U.S. prices are below world levels.

Perception versus Performance

The perception of airline deregulation is largely negative. Some of this negativity has roots in psychology. According to psychologists, people tend to overestimate any cause that is dramatic or sensational, such as the bankruptcy of an airline or a major air accident. On the other hand, people tend to underestimate the frequency of events that are common and unspectacular, such as an on-time air trip that the traveler planned enough in advance to obtain an attractive air fare. Media coverage magnifies the bias toward sensational events as it too focuses on catastrophes or violence.In air travel six or seven of ten trips may offer improvements in terms of either travel price or schedule convenience. Nevertheless, people tend to focus on the three or four of those ten trips where they have lost benefits, not on the larger number of trips where they have made gains.

People dislike change. Every year in January and February air fares go down, and every year in March and April fares go up. Rather than being pleased at the off-peak discount they receive during the winter, people react negatively each spring when the price goes back up. People like fairness and equity. They do not like having to pay an unusually high fare for tickets purchased at the last minute or learning that the passenger sitting next to them paid a lower fare. They are uncomfortable with discriminatory fares, even if overall fares are lower because of such pricing practices. There are emotional attachments to a brand name (such as Pan Am or People's Express) that cause people to regret its disappearance and not to factor in potentially poor economic or strategic performance on the part of those airlines' managements. As a standard for low fares, it is also easier to use the remembered bargains of a People's

Express than the higher fares of the period before deregulation:

Furthermore, people may blame airlines, and hence deregulation, for problems beyond the air-lines' control. An obvious example is people's tendency to impute delays due to weather, inadequate air traffic control, or airport capacity shortages to the operating airline. The consumer

remembers the particular airline on which he experienced the missed connection or other inconvenience and tends to blame to the airline (the visible party), rather than to the invisible causal party (the government) that might be truly responsible. Economists, in contrast, tend to neglect perception issues and focus instead on a few objectively measured performance characteristics. In terms of those characteristics, airline deregulation has exceeded its promises. Economists predicted price benefits in the range of $2.7 to $6.6 billion in 1990 dollars. Deregulation has produced benefits in exactly that range. Not everyone has gained, however. There are offsets to those price benefits from restrictions such as the Saturday night stay. Certain trips, such as those on monopoly routes or from concentrated hubs, have price premiums.

Economists felt there was likely to be no net improvement in service frequency; estimates ranged from $-.5 billion to $.5 billion. The reality has been that increased service frequency has yielded benefits that are even larger than those from pricing, even when the increased flight times for some trips are taken into account. Moreover, the industry has not yet stabilized, as the recent fare wars have indicated. American recently adopted a price simplification scheme to increase its share of business customers. The vigor of the responses by Northwest and TWA indicates how vital the pricing issue is to them. Recently, the industry as a whole has had poor financial performance with the new fare wars following immediately upon the recent recession.

Another paradox is that the industry, which in the 1970s and 1980s was freed from governmental intervention on rates and routes, increasingly in the 1990s must turn to government for international interventions and for infrastructure decisions on airports and air traffic control. Those areas have not been deregulated. It would be beneficial to take deregulation a step further.

The goal is to have airport operators charge efficient prices for takeoffs and landings and for operators and controllers to respond to market incentives for expansion. Privatization has been suggested. It might improve the current situation. But to do so, one would have to assume that the externalities conferred by airports to communities would serve to offset the natural monopoly aspect of airports. In the air traffic control area some residual regulation might be imposed to ensure that any governance change would not harm the excellent safety record to date.

There is no way to deregulate international aviation. But we could improve competition by changing U.S. rules on the foreign ownership of airlines and doing the same within Europe. If both U.S. and foreign carriers were given full access to each others' territories, travelers everywhere would benefit. In the absence of such policy changes, we are left with the paradoxes with which we started.

Conclusion

The new core capabilities airlines have adopted since deregulation have proved to be powerful tools for efficiency as well as for industry concentration. Benefits are so interlinked with technology that new rules to address the structural imperfections associated with hub-and-spoke route systems as well as price management and computer reservations systems would necessarily increase costs.

For consumers the perception persists that deregulation has been less successful than, in fact, it has been. There is a way for every rea**5.**l positive development to be cast so that it appears to be negative. It is natural for the media to portray the movement as being off-course. It is natural for consumers to remember their worst nightmare in terms of air travel price or service. It is unnatural and difficult to truly sort out the excellent overall performance from specific negative experiences.

AIRLINE PRODUCT DISTRIBUTION

In all areas of marketing, links must be made between the customer and the product. These links are known as Distribution Channels. Airlines use a variety of these channels. All of them are giving rise to particularly intense debate at the present time, because the different channels result in different costs, and because they vary in the extent to which they allow airlines to exercise proper and necessary control of the market. It is also an area where radical and controversial change is occurring, as carriers become increasingly adept at exploiting the potential open to them from on-line distribution,

Distribution Channel Strategies

Types of Distribution Channel

In any industry, firms can choose from different types of distribution channel. Some may opt for the direct route. This is where the producer makes direct contact with the final customers for its product, without any intermediaries being involved at all. This channel philosophy is normal in the industrial marketing of big-ticket capital goods. It certainly has been usual in the field of aircraft manufacturing, though the rise of the specialist operating lease companies has now in many cases provided an intermediary between the aerospace firms and their final customers, the airlines. In marketing activities involving less costly items a direct approach can still be adopted. For example, some firms choose to deal direct by selling their goods through mail order, backed by extensive advertising aimed at final customers, or increasingly, over the Internet.

Direct channels bring the advantage that no mark-ups or commissions have to be paid to channel intermediaries. They also allow producers to keep complete control of their marketing activities, and to be in touch with the true sources of demand for their products. The problem is that they may make it difficult for the producer to achieve sufficient geographical coverage, though in many areas (for example, insurance), this is being overcome as a result of peoples' increasing willingness to buy over the telephone or on-line. In many industries, producers make use of wholesalers. These are firms which buy in bulk from a range of producers, using their buying power to gain appropriate discounts. They then in turn sell on the goods, either by adopting a direct sell policy themselves, or by in turn using retailers. Retailers buy from wholesalers, and sell to the final customer for the product.

The essence of both wholesaling and retailing from the producer's point of view is risk-taking. Discounts will have to be given to allow an opportunity for mark-ups to be added and profits to

be made by the intermediaries. In turn, though, the producer's risks are reduced because once the goods have been sold to a wholesaler or retailer, unsold goods cannot normally be returned.

The remaining type of channel relationship is that of the agency. Such a relationship is common in service industries where there is only an intangible rather than a tangible product offered for sale. In such industries, producers often require wide geographical coverage, but find it costly or impossible to provide this in their own. They therefore use agents, who are paid commission each time they sell on behalf of a particular firm. The agent is able to make a living by selling a variety of products on behalf of many firms, in what should be a mutually beneficial relationship. The problem, of course, is that because agents are selling on behalf of many firms, they may be tempted to use their market leverage by working harder to sell the products of the firms which pay them higher commissions. Suppliers may in turn leapfrog each other's commissions in an attempt to secure agents' support, resulting in an inexorable rise in commission costs. Exactly this process was prevalent in airline marketing in the 1990s.

The aviation industry illustrates all of these different forms of channel relationship. In many ways, the role of the aircraft leasing company is that of a wholesaler. Firms such as ILFC and General Electric Capital Aviation Services buy large numbers of aircraft from the manufacturers and are given substantial price discounts for doing so. They then lease out these planes to their customer airlines, and in buoyant times make substantial profits as a result. They do, though, assume significant risks. In a market downturn, large numbers of aircraft may be returned to them by lessees, and, due to a glut of capacity in the market it may be difficult or impossible to place these aircraft with new customers or sell them in order to realise their residual value. Indeed, in the major recession of the early 1990's, the then-largest operating lease company, GPA, could not survive and was taken over on the edge of bankruptcy.Another example of a producer/wholesaler relationship has been that between charter airlines and tour operators in the European package holiday industry. The principle here has been that airlines have produced plane-loads of capacity which have then been sold to tour operators. In turn, the operators have added accommodation, surface transfers and other features of a holiday such as cultural tours or sporting opportunities, to make up a complete package. The tour operators have then been responsible for retailing these packages to the final customer.

In terms of agency relationships, it is of course the travel agency system which has been the dominant distribution channel for airlines in the past, and it remains so in many less developed aviation markets. The percentages are now declining markedly in many countries, but for many years airlines found that over 80% of their tickets were sold by travel agents. The trend until recently was in fact for this percentage to rise, with the forces of deregulation allowing the travel agency industry to cement its position as the industry's dominant distribution channel. Deregulation often meant rapid changes in airlines' schedules and fares. Often, the bemused consumer was forced to turn to an agent in order to find up-to-date information without the chore of contacting each of the airlines serving a route individually.

In recent years, of course, direct selling has become more and more significant as traditional airlines have supplemented direct selling through sales shops and call centres with an increasing

emphasis on web-based business. New airlines have appeared which largely or totally ignore the travel agency industry.

The Concept of "Super-Profits"

A significant section of this book will be devoted to the question of distribution channels, and the casual reader might ask why this should be so. The reason is simple: control of distribution channels is one of the most powerful drivers of profits in any industry, and this is especially the case in the airline business.

The concept of the control of distribution channels is a straightforward one. In any channel where wholesalers, retailers or agents are involved, producers must ensure that they are in a position to control the rewards received by these channel intermediaries. If a wholesaler, retailer or agent is in a powerful position, they will not be able to do so. Instead, the intermediaries will be able to play one producer off against another, only supporting those who outdo the others in terms of their offer of mark-ups or commissions. In turn, producers will receive only the rewards needed to keep them in the business from year to year. The "Super Profits" – profits over and above these basic rewards – will accrue to the intermediaries who are able to exercise control.

There are a number of danger signals which indicate a probability that producers will lose effective channel control. One is that each intermediary controls a significant share of the market. For example, in the UK grocery market, the scene is dominated by three giant supermarket chains, Sainsbury's, Tesco and Asda/Wallmart. Today, any producer of grocery products has to ensure that it goods are stocked by these firms. If they are not, then they will not be able to reach something like 70% of the UK market. The supermarket firms are thus in a strong bargaining position, a position emphasized by their robust profit performance in recent years.

The other worrying indicator of problems for producers is that their product is perceived as a "Commodity" rather than a "Brand". The subject of Brands Management is now a crucial one in Airline Marketing and the whole of the next chapter is devoted to it. Briefly, though, a commodity situation is one where customers perceive the products of competing suppliers to be identical. The brands case is the opposite of this, where customers see significant differences between the products of alternative suppliers.

The commodity situation is the ideal one for wholesalers, retailers and agents seeking to establish and retain control of a distribution channel. This is because customers have no strong preference as to which firm's products they buy. Therefore the intermediaries will be in a perfect position to play one supplier off against another, because it will be irrelevant from the customer's point-of-view as to which producer is supported.

In some industries, commoditization of the product has become so complete that the only way forward for producers wishing to protect their "Super-Profits" is to own, or at least franchise, their own distribution channel. This is the case, for example, in the petrol (gasoline) industry where in most countries the firms which refine petrol also own (or franchise)a network of filling

stations. It is very difficult indeed for a stand-alone refiner of petrol to earn a reasonable return, given the clear perception of many people that petrol is a commodity. One's car run exactly the same whichever brand of petrol is put into it.

Another sector where ownership of the distribution channel by producers has become the norm is in that of the European package holiday/charter airline area. Seats on charter airlines are often perceived as a commodity by vacationers, in the sense that very few will specify the airline with which they wish to travel when booking their holiday. Indeed many people do not know the identity of their airline until they arrive at the airport on their day-of-departure. Because of this, it is difficult for independent airlines which have no links to their distribution channels to survive. Such airlines can often make reasonable profits when demand is buoyant and capacity limited, as will generally be the case during the up-swing period of the Trade Cycle. They will find life much more difficult in a recession, when capacity will exceed demand and where market power will swing strongly to tour operator intermediaries. These firms will easily be able to play the independent charter airlines off against each other because passengers have no great preferences as to which airline they fly. The result will be strong profits for the tour operators and weaker ones for the airlines, to the point where some of the airlines may not be able to survive. A case-in-point was the UK airline Dan-Air, which disappeared (through a take-over by British Airways) in the recession of the early 1990s, for exactly the reasons described.

One final point needs to be made in this introductory section about distribution channel management. In almost all sectors of the economy there are very substantial differences in the capital invested by producers and by intermediaries. This is certainly the case in the field of travel. Airlines have to invest truly vast amounts in aircraft in order to grow and develop their businesses. For example, today the purchase of just one wide-bodied aircraft, may involve an outlay of perhaps $180 - $200 million. A fleet of these planes will require a risky investment of billions of dollars. In contrast, investments made by tour operators and travel agents will be tiny by comparison. This is becoming even more the case as the travel agency business becomes an increasingly on-line one without the need to invest in costly high street shops. It is absolutely essential that airlines should be in control of their distribution channels so that they can earn the "Super-Profits" which will give their shareholders a fair return on their money. As we shall see, there are now worrying signs that the rise of search engines such as Google provides an even more potent threat to this control than has existed in the past.

The Travel Agency Distribution System

Advantages and Disadvantages

Having established the general principles, it is now necessary for us to look in more detail at the particular issues raised by the past general reliance on the travel agency distribution channel in the airline industry.

In this context, it cannot be emphasized too strongly that this reliance always brought airlines very important benefits. Exactly as one would expect with an agency relationship, one of these was geographical coverage. An airline would have found it prohibitively expensive to have its

own sales shops in every high street and shopping mall around the world. Yet some passengers liked a personalized source of tickets, and someone they could turn to for advice and help. A travel agent provided such a presence by selling tickets on behalf of all airlines and tour operators, and by also offering services such as hotel, car rental and theatre bookings. Agents could – and still can − identify and explore specialist niche markets such as those dealing with hobbies like golf and winter sports, and those focusing on particular ethnic groups.

A second advantage of agency relationships was that they were not a heavy overhead burden on the airlines. It is true that all airlines had to incur the costs of agency support in the form of such things as training for agency staff and special telephone lines to deal with agents' enquiries. The principle though of the agency relationship was that the airline only had to reward the agent when the agent concluded a piece of business on its behalf. This was in contrast, say, to an airline-owned-and-operated sales shop in a city centre, which was an overhead cost burden on the carrier at all times, whether or not any business was actually being transacted.

A final point about the traditional airline/agency relationship was that agents undoubtedly relieved airlines of a great deal of the costly administrative work associated with air travel. For example an agent would issue tickets, assist with visa applications and deal with passengers' queries about airport check-in times, baggage rules etc. If they had not done so, carriers would have had to employ extra staff and resources. Generally, too, airlines paid their staff higher salaries than the poor levels of pay which were generally prevalent in the travel agency sector. Travel agents could therefore probably carry out this work at lower costs than would have prevailed if airlines had done it themselves.

Rising commission costs were in themselves worrying. They might have been justified, though, from an airline viewpoint, if they had resulted in investment going into improving the distribution channels so that carriers were being better served by them. Unfortunately, one's suspicion was that this was not the case, or at least that the level of investment by the travel agency industry was inadequate to sustain such a conclusion. Increasing commissions were often used by travel agents to finance an intensive market share battle between themselves rather than for investment to provide airlines with better distribution services. Such competition took on two forms. Firstly, in pursuing market share in the business travel market, agents were often prepared to pass on a proportion of the commission they earned to their retail customers in the form of discounts, either to build the loyalty of their existing clients, or to buy that of the clients of other agencies. Secondly, with sales to the leisure market, the manifestation of higher commissions came in the form of a proliferation of sales outlets as firms opened more and more retail shops to strengthen their geographical presence in the market relative to that of their rivals.

In both cases, airlines' money, paid out in higher commissions, was used to finance agents' battle for market share. This was not an acceptable situation, especially bearing in mind the huge investments (mainly through aircraft purchases) made by airlines in the future of the industry, and the comparatively small investments made by agents.

All in all, the situation of airlines with respect to their distribution channels was a very mixed one by the end of the 1990s and was ripe for reform. The travel agency distribution system

brought them important advantages, advantages emphasized by the domination of travel retailing which the system achieved. There were, though, significant problems too. The question for airline business strategy was therefore very clear. How could distribution channels be developed so that the advantages were retained, whilst the problems and shortcomings were alleviated?

Today's Distribution Channels

The situation regarding distribution channels today can be traced to a process of reform which dates back many years. In 1996, some airlines began to make radical changes. Market conditions at the time were very buoyant, something which is always likely to favour producers at the expense of intermediaries. At the same time, it began to become clear that the Internet held out the promise of being an alternative distribution channel which could challenge the dominance of the travel agency system. It was already being used by some of the new entrant Cost Leader airlines, which were achieving substantial cost savings as a result, further increasing the pressure on traditional carriers.

The first signs of change came when Delta Airlines announced that for domestic ticket sales in the USA, payments of commission would be capped at a maximum of $50, whatever the percentage calculation of the fare might be. The effect of this was to significantly reduce the amount of commission paid on expensive First Class and Flexible Coach tickets. Within a very short time, Delta's initiative was followed by all the other major airlines in the USA, and, despite many predictions to the contrary, it stood the test of time. Indeed, the process of reform has been both strengthened and widened. Commissions have been reduced or eliminated in many markets today. Where travel agents are still being rewarded directly by airlines, this is now often done using the so-called "Task Based" approach. With this, agents are not paid a percentage of the price of the ticket they sell. Instead, flat rate payments are made for each task the travel agent has undertaken – so much for making the booking, for issuing the ticket (an increasingly rare payment, as the use of electronic tickets proliferates) and for dealing with payment. The effect of such policies has been to reduce the travel agents' rewards significantly, again especially on First and Business Class tickets, and on Flexible Economy fares, where high prices had meant especially high payments to agents.

The overall effect of such reforms has been little short of revolutionary. The proportion of airline tickets being sold by traditional travel agents has fallen, as airline websites have become more popular and a new breed of on-line travel agents has appeared (a development to be referred to in the next section). At the same time, the relationship between airlines and travel agents has changed fundamentally, as agents have had to seek new sources of revenue.

This has been especially the case in the business air travel market. Here, in many markets, agents have changed their role into being one of a travel consultant for their clients, rather than an airline sales agent. They have argued, justifiably in some cases, that they have specialist skills in booking travel, in negotiating corporate deals with airlines and other travel suppliers, and in tracking and tracing travel spending to ensure that the firm gets the best value-for-money from its travel expenditure. In return for such skills, travel have asked for, and have been paid, management fees by their commercial clients.

Reflecting this change, many former travel agency firms have now re-christened themselves Travel Management Companies, to better reflect the working methods that they now employ.

The changeover from commission-based rewards to management fees paid by clients has had mixed results for airlines, but on balance it has proved to be a correct policy. It is true that agents are no longer the airlines' ally in selling higher-yielding tickets. Any form of reward for intermediaries based on commissions can be annoying for those who pay them, with often a feeling that the commission does not accurately reflect the work done. Commissions do, though, give a common interest to both principal and intermediary to secure the highest possible revenue. Management fees can have the reverse effect. In order for a travel agent to justify their work, and to ensure that they retain their travel accounts, they must show their commercial clients that they have managed the travel budget well, and that they have achieved the greatest possible cost savings. This may mean that they encourage booking on low yielding promotional fares, even if restrictive conditions apply to them, or book people on Cost Leader airlines via these airlines' websites, even though they receive no commission for doing so.

Despite this possible adverse consequence, changing the basis for the rewarding of travel agents has been a necessary and long overdue reform.

The Future of Distribution

Despite the changes of recent years, the question of distribution channels for airlines is one which is still in a state of flux. Can we yet forecast what the mature situation will be?

It is already clear that the future is going to see a greater proportion of airline seats sold using direct distribution channels. Airline call centres, sales offices and airport ticket desks will continue, but the growth in direct sales will not be explained by them. Clearly, most of this growth will come from the increased use of airline websites. Internet access is spreading rapidly around the world, and use of the Internet is now a regular part of daily life for hundreds of millions of people. These people are, of course, drawn disproportionately from groups who are likely to be regular air travellers. Also, airlines are increasingly adopting the simpler reservations and ticketing procedures, which are necessary to make internet booking commonplace. The newer Cost Leader airlines have always done this, and the "Legacy" airlines that they are threatening are increasingly responding.

Having said this, it is not the case that the future will see an end for the travel agents' role in airline distribution. Many better-managed agents will be able to defend their position by adopting policies which their clients will perceive as adding value. We have already looked at the business travel agents who are repositioning themselves as travel consultants rather than airline sales agents. On the leisure side, the better agents may be able to find niche positions by specialising in particular activities such as winter sports, golf, trekking etc. Clients may then continue to support them because they value their expertise.

The best opportunities for the travel agency industry in the future will stem from the one advantage that they will continue to hold over airline websites. When a passenger consults an

airline site, they will only usually be told about travel options and fares on that airline (and, perhaps, on its codeshare partners). In order to find out the best option out of the many that are available, they may have to spend a considerable amount of time looking at the websites of all the competitor airlines in the market. If, however, they consult a good travel agent, the travel agent will be able to display all the flight and fares options that are available and make a "best-buy" recommendation. This is a service which a traditional off-line travel agency can offer in some form, but it becomes an even more powerful one when it is made available over the Internet. Recent years have seen the rapid growth of a number of very large and well capitalized on-line travel agencies such as Travelocity (begun by American Airlines, but subsequently sold) and the Expedia service pioneered by Microsoft. This has in turn raised disturbing possibilities for airlines. Their websites have allowed them to loosen the formerly very tight hold that large travel agency chains held over them, but the rise of firms such as Expedia and Travelocity has raised the spectre of a new domination, this time by on-line rather than off-line agencies. Such a threat induced airlines to respond. In both the USA and Europe, consortia of airlines set up what amounted to their own on-line travel agencies, branded Orbitz in the US and Opodo in Europe, though again in both cases, these firms have now been sold by the consortia that owned them, presumably as a way of raising cash. In a wider number of cases, airlines have taken the apparently bizarre course of displaying not only their own flights on their websites, but also those of their competitors. They have done so as a way of providing their customers with a comprehensive booking tool, and as a way of countering the claims of on-line travel agents that only they can do so.

Overall, it is possible to reach a more optimistic conclusion about airline distribution (at least on the passenger side of the industry) than would have been possible only a few years ago. The use of the internet and the reform of the reward systems for travel agents have both made useful contributions to the correcting of what was formerly a totally unsatisfactory situation.

Global Distribution Systems (GDSs)

History and Background

For nearly twenty years, the subject of so-called Global Distribution Systems has been a controversial one in the airline industry, and it remains so today. The purpose of this section is to examine the reasons for this debate and to look at the future of GDSs.

Until the early 1970s, contact between airlines and their distribution outlets was mainly by telephone. This was both time consuming and costly, and became unsustainable as the industry grew. As the 1970s proceeded, the first, pioneering, carriers set out to automate airline/travel agency contact. In order to do so, direct links were provided from each agency location into the airline's reservations computer. Instead of phoning, agents could use the keyboard of a Visual Display Unit to make bookings direct with the airline concerned. Besides saving a great deal of time, this also gave the agent visual confirmation that the required reservation had been made.

In the USA, the leading airlines behind this move were United Airlines with its Apollo system, and American with SABRE. By the end of the 1970's these airlines had been joined in Europe by carriers such as Lufthansa (with START) and British Airways (with BABS).

By today's standards, these systems were extremely basic. They were, though, accompanied by controversy almost from the beginning. It was soon learnt that they provided a cast-iron way for the airlines which owned them to increase their market share at the expense of their rivals. The reason was that travel agents had a clear tendency to book their clients if they could from the first screen of information about the flight options in a given city-pair market. Indeed, booking was made from the first screen onover 90% of occasions. Over 50% of the time, the booking made would be that of the flight at the top of the first screen.

Given these facts, the option for the owner of the system was obvious. They needed to make sure that their own flights were the ones which were displayed most prominently. By doing so, they could obtain a handsome return on their investment through an increased market share. Generally, therefore, they were prepared to provide the systems free, or for a nominal rental, to the agents who used them. Also, though the flights of other airlines were shown, generally bookings were made on these airlines in small numbers, and little or no charge was made for such bookings. Indeed, other airlines' flights were only included because of the agent's requirement for a comprehensive system which would enable then to book all their client's requests on one system.

By the mid-1980s, the question of these early, biased, systems was becoming a controversial one. In the USA in particular, the airline industry had by this time been deregulated, and complaints were made by some airlines that bias in Computer Reservation Systems was significantly hindering the operation of the supposed free market in aviation. This complaint was, of course, raised most vociferously by the airlines which did not have a significant presence in the GDS industry. At the same time, those that did have such a presence – notably American Airlines – argued that the returns they were getting through biased displays merely reflected the investment they had made and the risks they had taken.

The outcome of the debate was that GDS displays – ironically in a supposedly deregulated industry – became subject to regulation by the US government, a move subsequently followed by the European Commission in respect of GDS operations within the European Union. The regulatory regime in both cases had essentially the same purpose, though there were differences in detail – to ensure display neutrality. This purpose was largely achieved. Though the question of the fairness of the rules continued to be debated, any subsequent bias in the systems was at a far lower level than was the case during the 1980s.

Once displays became regulated, it was inevitable that a further issue would arise. Airlines which had invested heavily in GDSs – and American Airlines was by this time claiming that it had spent more than a billion dollars on SABRE – expected to get a return on their investment. If biased displays were ruled out, how was this return to be obtained? The answer soon became clear. The system owners began to charge other airlines substantial fees for every booking made, at an initial level of about $2.80 per flight sector booked

The effect of booking fees was dramatic. Suddenly, Global Distribution Systems were transformed into highly profitable businesses, with American Airlines in particular soon conceding that its involvement in GDS was the most lucrative of all its activities – much more so than the airline itself. At the same time, booking fees provided American with the resources it needed to continue to invest in SABRE. At that time, more than 40% of the travel agents in the USA were using SABRE, giving the system considerable power in that market. There were rumors circulating of American's intention to achieve such dominance on a global basis. Had they done so, their ability to levy higher and higher booking fees would have been immense.

To address the perceived threat of SABRE, it was necessary for other airlines to make counter moves, and in Europe two groups of carriers came together to form consortia, each with the aim of setting up a system with the functionalities and customer base necessary to compete with SABRE. The result was the formation of the AMADEUS and GALILEO consortia in 1987. Both these systems were up and running by the early 1990s, when a series of mergers and acquisitions finally lead to the emergence of a mature industry structure. As one would expect in an industry where there are very large Economies of Scale, this structure was an oligopolistic one. SABRE was a dominant player, as were GALILEO and AMADEUS, both having strengthened their position through mergers with US-based systems in the early 1990s. The fourth and smallest player was WORLDSPAN, a system jointly set up by three US airlines, Delta, Northwest and TWA. (As has been noted, World span is now soon to disappear in a merger with Galileo).

The most recent developments have seen changes in the ownerships of the GDS industry. Airline enthusiasm for the internet as a distribution channel – brought about in part because of the high charges they were incurring in GDS booking fees – has resulted in a lower proportion of bookings coming through the traditional travel agency/GDS channel. This has ended what might be called the "golden age" of GDS profitability. At the same time, airlines having an ownership stake in one of the GDSs have been under pressure to raise cash in order to maintain liquidity. The result has been that these stakes have almost all been sold off. In some cases, this has been through an Initial Public Offering (for example, with the American Airlines holding in Sabre), or through a trade sale (Galileo is now a wholly-owned subsidiary of the US-based Cendant Corporation).

The selling off of airline stakes GDS's has given the industry a degree of unity of purpose about them. Before, those airlines which had an equity stake in a GDS (and which were therefore benefiting from the substantial dividend income they were then receiving) took a different attitude to the question of booking fees than those who did not. Today, almost all airlines have a common interest in lowering booking fees to achieve more cost-effective distribution. Recently, too, in America at least, the GDS industry has been deregulated, with in particular an ending of the requirement that GDS owners must treat all airlines equally. This, together with a reduced regulation of displays, has allowed negotiations to begin around questions of trading display standards and content against booking fees.

Current Issues

Though the subject of bias in Global Distribution Systems is now somewhat less controversial than it was, there are still some substantial debates in progress. Amongst the most contentious of these is the question of funding of the GDSs. Airlines now argues that they pay, through their booking fees, a disproportionately high level of total costs, whilst the travel agency industry pays far too little.

In principle, both airlines and travel agents benefit from the availability of a GDS. Airlines certainly gain from the wide distribution of their product, but agents also find that their costs are significantly reduced because of the much greater staff productivity they can achieve. The original suggestion was that GDS costs should be met to an equal degree by airlines and agents, reflecting these mutual benefits. This has not turned out to be the case. With the economics of a GDS so dependent on the volume of throughput, the GDS firms have had every incentive to try to steal market share from their rivals. In order to do so, it became a common tactic to allow travel agents the use of a system for a very low rental or, in many cases, if throughput in terms of the number of bookings made is sufficient, for the GDS companies to actually pay them for using their system. The result was, in many countries, an intense market share battle, with agents being offered bigger and bigger incentives to switch from one firm's system to another. In turn, a larger and larger share of GDS costs have in practice been paid by airlines through booking fees – current estimates are that more than 90% of GDS income is being derived in this way.

The dominance of airline funding of Global Distribution Systems has in turn led to two further controversies. The travel agent will often have a deal which ensures that the GDS will be made available free-of-charge, or for a nominal rent providing a sufficient number of bookings are made. Then, the agent with a sense of humor will have a clear incentive to make false and fictitious bookings if the number of true bookings they have is insufficient to reach the relevant break-point. Not surprisingly, such practices have provoked outrage on the part of those airlines that have been the victims of them, for the booking fees levied by the GDS companies have been based on the sectors booked, not on the number of passengers carried. Because of the controversy, the GDS firms have had to divert significant resources to policing false and passive bookings and, because they have done so, the problem now seems to be more under control.

The same certainty cannot be said for the second major problem associated with GDS funding. We have already seen how the travel agency system dominated airline distribution channels, and that until recently the system was costing airlines more and more. Because of this, it became a clear policy objective for many carriers to reduce their sales through travel agents. The use of the Internet, and the development of electronic ticketing are the technical developments which have made this possible. As we have seen, in responding to this challenge to their dominance, better-managed travel agency firms are making what is, for them, an entirely logical move. They are repositioning themselves as travel management firms, able to assist corporate customers not only in the making of bookings, but in the negotiation of deals with airlines and other principles, and in the subsequent policing of expenditure to make sure that those who travel using the firm's money abide by its corporate travel policies.

Such a repositioning requires the travel agent to have a number of tools available in the form of computer systems to aid effective travel management. The GDS firms have been only too willing to develop these tools, hoping that by doing so they will be able to cement their relationship with their existing travel agency customers and also hopefully attract some new ones from rival GDSs. By a supreme irony, though, these system developments have largely been funded by airline booking fees, with the actions of the GDS firms helping travel agents to retain at least a proportion of their hold on airline distribution channels at exactly the time airlines have been seeking to reduce it.

A final issue for the GDS firms reflects the emergence of the so-called "Cost Leader" airlines referred to in Section 4:2:1. Airlines such as Southwest in the USA and Ryanair and Easyjet in Europe have grown significantly in recent years. Their strategy had been based on a low cost/low fares proposition. In order to lower their costs to the level which will make their low fares profitable, they have tried to simplify the product they have offered. In particular, they have generally use simple fares and reservations procedures, and have not offered interline or transfer services to their passengers, working purely on a point-to-point basis.

In the strongest contrast, the GDS firms have been proud to point to the sophistication of the services which, through the travel agent, they can provide to the passenger. A passenger today can contact their travel agent and make a very complex multi-sector booking on any number of different airlines, dealing at the same time with issues such as seat selection and special meal requirements. They can be given information about any fare which is on offer, as all the GDS firms maintain enormous fares databases. Finally, they can book any extra requirements they may have for such services as car rental or hotel accommodation.

Of course, the GDS firms argue that such sophistication comes at a price and they would claim that the booking fees charged represent very good value-for-money given the range of services on offer. The problem is that the customers of the low fares airlines do not need this level of sophistication yet are being asked to pay for it, because booking fees are levied on a flat-rate basis. Worse still, the booking fee, were it to be paid, would represent a very significant component of the fare the passenger had paid.

The upshot of this controversy is that, as we have seen, the GDS industry had been shunned by the low fare airlines. The oldest of them, Southwest Airlines, pays only for a low level of participation in one of the GDSs, SABRE and has no relationship with the others. It also tries to actively encourage bookings which allow it to avoid booking fees completely, through its own call centres or the Internet. In Europe, Easyjet is an example of a direct-sell airline, avoiding completely the travel agency distribution system. Through doing so, it has also avoided any need to be displayed in the databases of the GDS firms and has been able to add the elimination of GDS booking fees to the savings on commissions which it has achieved.

In such a changed world, the GDS companies have been shaken out of their complacency and are adopting a number of expedients. One of them, Amadeus, has embarked on a major diversification policy and now makes a considerable proportion of its income from the work which it does in the field of airline Information Technology consulting. It has also built a

business in assisting airlines in their website development, thereby obtaining at least some revenue as a result of the Internet revolution. Each of the firms is also developing products with lower levels of functionality which, they hope, can be sold to the Low Cost Carrier sector. Though there would seem to be little prospect of them doing so to airlines - like Ryanair - which take the low cost theme to its extremes – they may be successful with airlines such as Jet Blue and Air Berlin that may come eventually to have at least some relationship with travel agents and corporate travel buyers.

As has been noted before, the final area where the GDS firms are having to respond to the new market realities is with respect to their booking fees. It has always been a subject of debate between the airlines and the GDSs as to who needed who the most. The GDSs have argued that without them, airlines cannot sell effectively. On the other hand, without airlines releasing their schedules and fares through the GDS system, no GDS business could exist. It is vital that the GDSs (and on-line travel agents for that matter) should be able to claim that the lowest fares available can be found on their sites. If passengers lose confidence in this proposition, they will stop visiting the sites. Because of this, airlines have now found a potent negotiating tool, by only allowing their lowest fares to be sold through GDSs in return for significant reductions in their booking fees. By a supreme irony, one of the carriers most active in pursuing this policy has been American Airlines. It was, of course, American, when it owned SABRE, which originally developed the business model for GDS pricing.

There is one final development now taking place in airline distribution policy which has the potential to put all previous arguments about GDS pricing, bitter though they have often been, into the shade – the rise of search engines, especially Google. There seems little doubt that the firms that run these engines are already in a position of considerable power, and that this power is going to steadily increase. When someone begins a search by entering such things as 'Cheapest fare to……..', or 'Best airline to…….., what the search reveals will be highly significant in the booking that they finally make. It seems inevitably that airlines will have to pay large sums to the search engine owners to ensure that references and links to their sites are properly displayed.

Distribution Channels in the Air Freight Market

The question of product distribution is no less controversial on the freight side of airlines' activities – indeed it could be argued that airlines are further away from finding a solution for their freight distribution problems that they are for those on the passenger side. We have seen that the equivalent to the travel agent in air freight is the air freight forwarder. Forwarders provide the same sales agency function as the travel agent does. They also have an important role to play in the handling and consolidation of freight.

Forwarders have only a small role in the so-called "Express" market of small urgent packages. The Integrated Carriers that dominate Express have built powerful retail brands and have invested large amounts in ground handling systems, which largely negate the role of the forwarder. In the remaining markets of so-called "Heavy Freight", though, the domination of the forwarding industry is almost total. The proportion of heavy freight in the hands of forwarders is

well over 90%.Such a reliance on a single channel of distribution would be unhealthy in itself, but the structure of the forwarding industry makes it worse still. Forwarding appears to be an industry where there are substantial Economies of Scale, and where important advantages accrue to the largest firms. Fewer than 15 global forwarders now dominate the market, with this number tending to reduce steadily through time as a result of what appears to be almost continuous merger and takeover activity amongst the leading players. The degree of consolidation is now increasing still further as the Integrators and the largest forwarders begin to link together.

The result of airline reliance on one channel of distribution is entirely as one would expect. Profits in the airline sector of the air freight industry have been under great pressure in recent years. A serious market downturn in 2000 and 2001 was followed by overcapacity and falling yields on many routes with only a modest improvement coming about in 2004 and 2005. In the strongest possible contrast, reported profits of publicly-quoted air freight forwarders during this time had never been better. Overcapacity amongst the airlines benefited them as they were able to play one carrier off against another, lowering the rates that they paid and in turn increasing the profits they made on their consolidations.

Rather than getting less, forwarders ability to play one airline off against another may be increasing. A number of airlines are now forming consortia, the aim of which is to streamline the process of booking in the air freight industry by the use of the Internet. At the moment, booking is mostly an archaic process using the telephone and appears ripe for reform. Internet platforms such as that provided by the GFX Company are revolutionary. They are certainly achieving a streamlining of the process, though the charges rendered by GFX promise a controversy comparable to that generated by Global Distribution Systems on the passenger side of the industry. The charges made by the GFX organisation on the airlines that use it have been high enough to discourage many carriers from joining, whilst the question of the display which each carrier's flights are given in the system is likely to be controversial. Most seriously of all, GFX may complete the commoditization of the air freight product, with forwarders able to make an immediate comparison between the rates on offer from the different competitors in a market. Great power will then accrue to the lowest-pricing airline, giving an endemic tendency towards rate cutting, especially in an over-supplied market.

It is easy to conclude that the present situation with regard to distribution channels for air freight is unsatisfactory. Airlines have too little market power despite making the bulk of the capital investment in the industry. They have also failed to make the progress seen on the passenger side in recent years, where the situation today is a good deal better than itwas in the late 1990s. Unfortunately, arriving at solutions to the problem will not be easy.

In the past, some airlines have attempted to address matters by buying into the forwarding industry, or by setting up subsidiaries to compete with forwarders in such areas as off-airport ground handling. These attempts have generally not been successful. Whatever benefits they may have brought in terms of improved market control have been outweighed by the fact that remaining independent forwarders have generally reacted angrily, regarding such moves as an invasion of their territory. The commercial damage that they have been able to inflict has

generally outweighed the benefits. A more promising initiative has been taken in recent years, most notably by Air France. This airline appears to have learnt from the computer chip industry, and the strategies of Intel. Intel does not manufacture its own computers, but maintains a strong position with those who do by investing a great deal in the development of a powerful brand for its microprocessors. Air France has developed brands in air freight based on time-definite deliveries and different segments of the market. The airline clearly hopes that these brands will be requested more when shippers and forwarders are contemplating which airline to use.

Overall, questions of distribution strategies are today amongst the most contentious in the whole field of Airline Marketing. It is essential that airlines should control their distribution channels as it is largely their money that is at risk through these channels. The problem is that safeguarding long-term channel control may conflict with short-term objectives to maximize revenues, especially given the powerful positions that the industry's wholesalers and retailers have been able to build

PRICING AND SEAT INVENTORY MANAGEMENT

AIRLINE ECONOMICS AND PRICING PRACTICES

Determining the price a potential passenger would pay to fly between two cities used to be a relatively simple exercise. The biggest choice facing the passenger was generally between the first class and regular economy or coach fares, which were identical on all carriers and were derived on the basis of mileage-based fare structures imposed by the Civil Aeronautics Board, or IATA for international services. In certain markets, price discounts might have been available to those meeting certain age requirements (children, senior citizens), traveling as a family or group, belonging to specific organizations (military, travel industry), or flying on selected "night coach" flights. Apart from "night coach" fares, these special fares represented truediscounts in price for a standard service. Potential passengers had only to choose between the two or three carriers serving the city-pair market desired on the basis of reputation, service and schedule convenience.

Needless to say, the airline pricing situation has changed dramatically. The practice of discounting prices on standard service options has given way to the creation of differentiated service options offered at prices lower than the standard coach fare.

This chapter describes the evolution of airline marketing strategies that has led to the wide range of price and service options offered in the current airline marketplace. The theoretical economic concepts on which these strategies have been based are presented first, and the development of a need to control seat inventories more effectively is outlined. The second section of this chapter explains how airlines have applied these theoretical concepts and adapted them to the practical constraints of their reservations and ticketing processes. Finally, a description of the price and

service options available in most domestic airline markets at the present time provides an up-to-date illustration of the extent to which the simple pricing structure of the 1960's has changed.

Empty Practices and Capacity-Controlled Fares

The introduction of advance purchase excursion (APEX) fares in international markets enabled any passenger, regardless of age or group affiliation, to purchase air travel at a reduced price. These fares required advance purchase of a round-trip ticket and a minimum length of stay at the destination point. The reduced price was therefore available only for a service option that was different in its conditions of use from the standard coach fare, even though the flights, seats, and on-board service amenities were generally identical. This type of fare spread to U.S. domestic markets in 1975 when American Airlines introduced its first "super-saver" fares.

Restrictions on the use of these lower fares were imposed by the airlines to limit their use to leisure or vacation travelers. The original objective of these fares was to stimulate new demand in the discretionary travel market segment, which would in turn fill otherwise empty seats and generate additional revenues for the airline. By applying advance purchase, length of stay and round-trip itinerary requirements, airlines hoped to keep full-fare business travelers from making use of these lower fares, and thereby introduced a new type of air travel service option to the market.

Research done by the Boeing Aircraft Company into the nature of empty seats on the larger wide-body aircraft that entered service in the 1970's encouraged airlines to apply such restrictions to reduced fares to prevent the diversion of existing demand from higher fare levels. Boeing argued that, due to an inherent variability in demand for air travel and an inability on the part of the airline to provide exactly the number of seats required satisfying all full-fare demand, empty seats are inevitable. The inevitability of having unsold seats and the potential for recovering additional revenues from them led to Boeing's development of an approach for "surplus seat management", which involved forecasting the number of seats that would otherwise remain empty.

While inevitable, the existence of empty seats in an airline's operation is not entirely undesirable. Given the flight-to-flight variation in full-fare demand, some empty seats are necessary to provide a "buffer" for accommodating unexpectedly high demand and to maintain a high quality of service in terms of seat "availability" for full-fare passengers. This buffer ensures a reasonable probability of the airline being able to accommodate last-minute passengers with changes to their travel plans. Beyond the number of seats required to maintain a reasonable "availability" buffer, additional empty seats may also contribute to a feeling of spaciousness for those on board. On the other hand, too many empty seats (overcapacity) contribute nothing in revenue and represent a sunk cost to the airline.

Under ideal conditions, airlines can increase their revenues by filling up some or all of these vacant seats with incremental demand without a corresponding increase in operating costs. Because of the large proportion of airline operating costs that can be considered fixed in the very short-run (given a commitment to operate a flight schedule over a month or longer), the marginal

cost of carrying an additional passenger in an otherwise empty seat is very low. The incremental costs involved in reservations, ticketing, baggage handling and meal service for an additional passenger typically amount to much less than $25. As a result, prices much lower than full-fare can be charged to attract incremental demand. As long as the incremental revenue per passenger exceeds the marginal cost of carrying each one, a contribution will be made to the fixed costs of the flight. It can thus be entirely rational, in the short run, for an airline to offer seats that are sure to remain unsold at prices a slow as, say $29, for a scheduled transcontinental flight.

In the case of air transportation, determining the relevant marginal cost for pricing purposes is difficult. The marginal unit of production for an airline in the short-run is a flight departure with a fixed seating capacity, whereas the marginal unit sold to the consumer is a single seat on that flight. For a scheduled future flight departure, fixed aircraft operating costs per passenger decrease as the number of passengers actually carried increases, up to aircraft capacity. Assuming a single class of service, variable costs per passenger are constant, independent of the number carried on a particular flight. Total costs per passenger are thus minimized when the fixed costs of operating the flight are spread over a full planeload of passengers.

Given these conditions, a single price charged for all seats based strictly on marginal variable costs might not cover the total operating costs of the flight. For that matter, depending on the cost structure of the airline and the level of demand, there might not be any one price that will cover total operating costs of the flight.

It might be possible, however, for firms in an oligopolistic industry to segregate the purchases of individual consumers and charge each consumer as much as he/she is willing to pay. In theory, each incremental purchaser would be charged less and less as more output is sold, up to the point at which price equals marginal cost. In practice, a firm might be able to identify distinct groups of consumers and charge each group a different price for a homogeneous product. For an isolated flight scheduled to operate with a given aircraft and fixed number of identical seats, the marginal variable costs are constant per passenger carried. The fixed aircraft operating costs per passenger decrease with the number of seats filled, meaning total costs per passenger also decrease, as shown.

Under this strategy, total revenues exceed total operating costs of the flight as long as the striped area is greater than the shaded area.

Pricing in airline markets, which are oligopolistic in most cases, is well-suited to this concept of differential pricing. Such a pricing strategy is economically desirable if:

1. the relevant costs of taking on incremental passengers are less than the average total costs of the flight;
2. lower prices are required to stimulate incremental demand;
3. the incremental demand is sufficiently elastic that reduced fares increase total revenues by more than the increase in total costs.

Differential pricing of identical seats on a flight departure can enable the airline to generate the additional revenue required to cover the total costs of the flight from those passengers using the reduced fare options. Airline efficiency can be enhanced, as better use of existing equipment with its sunk costs can be realized by filling otherwise empty seats. It is also possible for the airline to reduce cyclical variations in demand over time through selective time-dependent price reductions and effective seat inventory control, as will be discussed. From the consumer's perspective, the practice of differential pricing by airlines can in theory benefit all passengers, resulting in a pare to optimal market situation. As long as the full-fare passengers do not pay more than they would have in the to keep full fares lower than they otherwise would be. And, as long as seat inventory control is practiced effectively, full-fare passengers need not be denied seats due to high demand for low fares. In the longer run, full-fare passengers stand to gain from the potential increase in flight frequencies required to accommodate increased total market demand. Low-fare passengers benefit from the availability of lower-priced air travel options, either by saving money on a planned trip or by being able to take a trip that would not otherwise have been taken. The only theoretical problem associated with the practice of differential pricing occurs when the lowest fares become too low. If the low-fare option, which was offered only to fill "surplus" seats, is priced below its marginal variable costs, a situation of cross-subsidization between passenger groups exists, compromising both economic efficiency and consumer satisfaction. It can be argued, however, that in the theoretically ideal situation in which the seats made available at lower fares are identifiable as surplus and full-fare passengers are notable to take advantage of the low-fare options, it would take an almost ridiculously low discount fare to raise valid concerns about cross-subsidization.

Application of the differential pricing concept in actual airline markets requires the identification of distinct segments of the total demand for air travel. Market demand segmentation involves dividing the total demand for a product into separate groups of potential buyers who might require or prefer different product characteristics.

If differentiated air travel options can be offered to each demand segment, then price differentials can be applied more effectively. In the Boeing approach to surplus seat management, demand segmentation through the application of "restrictions" to the lower-priced service options is essential to maximize stimulated demand and to minimize the diversion of full-fare passengers to the lower fare options.

The development of an effective approach to seat inventory management is thus dependent on the attributes of the different service options and the market demand for each. Airlines have attempted to differentiate their reduced-fare options from their full-fare services to keep the cross-elasticities of demand between options low, thereby reducing the potential for diversion. The concept of product differentiation has been applied by airlines to their service options. Each option is in essence a fare product that can be defined by the restrictions on its purchase and use, differences in-service amenities, and a price level. Under ideal conditions, each fare product should be associated with restrictions, amenities and a price that will make it attractive to a particular market demand segment.

Airlines traditionally have identified demand segments under the assumption, supported by empirical evidence, that there exist substantial differences in demand elasticities between business and leisure or vacation travelers, and little or no cross-elasticity. While there are differences in the literature with respect to the specifics of airline market demand segmentation, there is a consensus that price and service elasticities of demand are the strongest determinants of demand segments. Total market demand is a function of both the fare levels offered and the levels of service provided by the airline and its competitors. Different segments of that demand will place different weights on the importance of low fares versus the reduced restrictions and/or increased service amenities associated with higher-priced fare products. It is important at this point to emphasize the distinction between the airline's output, usually considered to be an available seat flown from one airport to another, and the airline product as purchased by the consumer. The demand for air travel is a derived demand, meaning the consumer does not purchase a quantity of available seat-miles as if they were a commodity. The value of air travel is related to being at a specific place over a certain time period. A ticket purchased for air travel is associated with a specific origin, departure time, destination and arrival time, which comprise an air travel "package". Included in this package are the attributes of the fare products being considered, such as ticket purchase and itinerary limitations, refund ability, as well as amenities such as on-board space and service.

For the purposes of demand segmentation, airlines have recognized that differentiated fare products can in fact be offered at different price levels because of the price and service elasticities of air travel demand. Travelers very sensitive to price will base air travel decisions almost exclusively on a lowest fare criterion and will be willing to contend with the restrictions, reduced service amenities, and perhaps less convenient flight times or routings associated with the lowest-priced fare products.

Conversely, passengers with time constraints and service-sensitive travelers will value level of service factors such as schedule convenience, travel flexibility and inflight amenities, to the point that price might not be a decision factor in selecting air travel. Of course, there exists a continuum between these two extremes, along which the majority of air travelers are likely to fall. Given this continuum between extreme price sensitivity and extreme service level sensitivity, it can be difficult to divide the total demand in an airline market into well-defined segments. Most airlines have in the past attempted to use various socioeconomic and travel characteristics of air travelers to identify distinct travel groups. A distinction was made between the business and leisure segments of total market demand, under the assumption that persons traveling on business are far more likely to be sensitive to time or level of service factors and relatively price-insensitive. At the same time, leisure travelers have been assumed to be more concerned about price, and perhaps less sensitive to certain service-related characteristics.

Airlines attempted to ensure that only the leisure travel segment purchases low priced fare products through the imposition of ticketing and travel restrictions designed to "fence out" the full-fare business segment. The most commonly imposed fences were conditions requiring advance ticket purchase and round-trip travel with minimum length of stay at the destination, defined so as to preclude those on business trips from making use of the discounted fares. The

use of "super-saver" -type fare products spread industry-wide in the United States in the mid-1970's, and airlines found that properly fenced low fares could in face generate incremental leisure traffic. The problem that airlines faced, however, was that the seats being sold to leisure passengers at lower fares were not necessarily those that would have gone empty. Low-fare passengers wanted to choose the same peak period flights that were already popular with business travelers. Even worse, because advance purchase conditions required reduced fare passengers to book earlier than most full-fare passengers, passengers paying lower fares in fact displaced full-fare passengers from the most desirable flights. Airlines experienced flight loads that were not significantly higher, total revenues that were actually lower on peak period flights, and a loss of goodwill by business travelers frustrated by their inability to obtain seats on desired flights.

This experience led to the introduction of capacity-controlled reduced fares. Airlines recognized the need to limit the number of seats made available to their low priced fare products and, furthermore, to distinguish between low-fare seat availability on peak and off-peak flights. More sophisticated statistical analysis was required to predict the number of full-fare passengers that could be expected for each flight departure, to establish an adequate availability buffer of empty seats above this expected full-fare demand and, then, to allocate any remaining seats to lower-priced fare products. The number of low-fare seats could thus vary by day of week and time of day for flights in a given market.

A methodology for managing capacity controlled fare products was presented by Boeing in a package it called the "Surplus Seat System" . Boeing's approach used historical full-fare demand data by flight, day of week and season of the year to derive an estimate of expected full fare demand, also by flight. A growth factor was applied, and an optimal buffer determined to reduce full-fare reservations denials to a targeted level. Remaining seats were deemed to be "surplus" and made available to low-fare passengers.

Changes to Surplus Seat Concept

The basic principles of surplus seat management and capacity-controlled fares remain valid and continue to be used by airlines today. There have been changes, however, to the simple two-class demand segmentation and differential pricing model proposed originally by Boeing. Passenger behavior and demand characteristics have evolved, making the identification of distinct demand segments more difficult. Furthermore, the competitive environment of the airline industry has changed dramatically. With flexible pricing and competition from low-cost new entrants, it has become more difficult for any airline to use differential pricing to its fullest potential. And, given that less than 10 percent of airline passengers traveled at the full coach fare in 1986, the notion that reduced fares represent a "surplus seat “product for airlines is no longer valid. Each of these changes is discussed briefly below.

First, market demand segments have become more difficult for airlines to identify. The business versus leisure classification of passengers adopted initially by airlines offering differentiated fare products overlooked all other types of non-business travel. Leisure (vacation) travel is but one component of the non-business or personal travel segment, which includes travel to visit friends

or relatives ("VFR"),and personal emergency travel. Increases in the proportion of personal relative to business air travel have made the identification of price- versus service-sensitive demand segments more complicated. A survey of passengers conducted by the Canadian Transport Commission (CTC) in 1979 found that up to 45 percent of business and mixed business-pleasure trips in domestic markets could be considered price sensitive, while 39 percent of non-business trips were in fact non-discretionary and thus service-sensitive.

Findings such as these indicate that market demand segmentation based solely on trip purpose might not be the most appropriate. The characteristics of price sensitive versus on-demand travel suggest that, in most cases, a trade-off is made by the passenger between the price of an airline ticket and the need to have travel flexibility and service amenities, or even the need to travel at all. The CTC has undertaken numerous passenger surveys in an attempt to identify more clearly the main determinants of the price versus service trade-off, examining both trip and traveler characteristics. While traveler characteristics had "very little impact on price sensitivity independent of the type of trip being taken", trip characteristics showed a strong relationship with the price versus service trade-off. Trip purpose, trip distance and length of stay were all examined for their influence on price and service sensitivity. Trip purpose exhibited the strongest relationship with the price-service trade-off, although considerable overlap by price-sensitive business travelers and service-sensitive non-business travelers was evident in the results, as mentioned earlier. Trip purpose also showed a strong relationship with length of stay, which in turn had only a moderate influence on the price-service trade-off. Trip distance showed little relationship with the other factors, apart from a moderate influence on length of stay.

Given that trip purpose seems to be the most important determinant of where a passenger lies along the price-service trade-off continuum, it is not surprising that airlines have traditionally focused on the business versus non-business demand segment definition. Many of the restrictions applied to low-priced fare products are designed to prevent the diversion of business travelers from higher fares. The overlap between the traditional market demand segments implies, however, that trip purpose as the sole demand segmentation criterion does not distinguish among the traveler groups that have emerged with the evolution of multiple fare product offerings. Just as there are business travelers willing to give up some service amenities in exchange for a lower fare, there are non-business travelers willing to pay more for better service and travel flexibility.

The concept of a price-service trade-off continuum, as described by the CTC studies, allows demand segments to be defined independently of trip purpose. Its disadvantage is that the continuum is one-dimensional - the consumer is assumed to be either price-sensitive or service-sensitive, but not both. Furthermore, the term "service-sensitive" is ambiguous, in that it refers to both the need for on-demand travel flexibility and a preference for other service amenities. A consumer's need to have travel flexibility reflects a sensitivity to the time elements of air travel (i.e., departure time, enroute time, and return time), which could well be independent of the many other "service" dimensions of a fare product. Schweiterman presented another approach to air travel demand segmentation, identifying three segments on the basis of a somewhat arbitrary breakdown of both the time- and price-sensitivity continua, as follows:

1. Highly discretionary consumers, traveling for personal reasons, willing to alter their travel plans over a large time "window" to obtain the lowest fares, and able to meet advance purchase and length of stay restrictions;

2. Moderately discretionary consumers, who will travel only with a discount from the full coach fare and are able to meet less stringent advance purchase requirements (up to 7 days in advance), but are unable to meet minimum stay requirements of a week or more, and are not willing to accept significant deviations from their desired flight times;

3. Non-discretionary consumers, such as employees traveling for business purposes, not willing to compromise schedule convenience, and unable to meet any advance purchase or minimum stay conditions.

Schweiterman's three-segment model makes reference to trip purpose, but in fact relies implicitly on the notion of trip "value" to consumers in order to distinguish between discretionary and non-discretionary trips. The "value" of a trip to the consumer in Schweiterman's model is determined by the presence or absence of time constraints on being at a location at a desired time. The value of a trip may decrease, to zero in some cases, if these time constraints cannot be met.

We can develop a demand segmentation model that incorporates explicitly the notions of both the price-service trade-off and the value of a trip as determined by the consumer's time-sensitivity with respect to a given trip. Both concepts are important in the identification of demand segments in airline markets where a wide variety of fare products are offered. By separating time-sensitivity from price-sensitivity and its implied trade-off between price and service attributes other than time, we can characterize consumer groups without reference to trip purpose and at the same time avoid the overlap of the above demand segment definitions.

Furthermore, we can define consumer groups independently of the fare products available at any particular time. The availability of differentiated fare products at various price levels requires consumers to make a trade-off between the higher-priced fare products associated with high levels of service amenities and fewer restrictions, and the lower-priced fare products with greater restrictions and, in some cases, reduced service amenities.

Given a range of fare product options and a budget constraint, each consumer will choose the fare product that maximizes some measure of "value", subject to the budget constraint. Alternatively, the consumer might choose the fare product that minimizes dollar costs, subject to a minimum "value" threshold. In either case, a choice is made between "value" and cost.

This choice is related to the price-sensitivity of the consumer for a given trip, and is not independent of the time-sensitivity of the trip being considered. The time-sensitivity of a trip is determined by the length of the "time window" over which a trip may be taken and still provide the consumer with a certain "value" of being at the desired location. A totally non-discretionary trip is one that must be taken at a specified time, meaning the acceptable time window for the trip is very short. On the other hand, a totally discretionary trip is one for which the acceptable time window for travel is extremely long. For the purposes of market demand segmentation,

then, the time-sensitivity continuum incorporates the notions of discretionary and non-discretionary travel, without reference to trip purpose. A consumer's location along both the price-sensitivity and time-sensitivity continua can differ from one planned trip to the next. An individual can be insensitive to price for an extremely time-sensitive trip, be it for business or personal purposes.

The same individual can be extremely price-sensitive for a trip that has no time-sensitivity associated with it, again regardless of trip purpose. Given that any one trip will lie somewhere along the time-sensitivity continuum, and given that the potential traveler must fall somewhere along the price-sensitivity continuum for each trip being considered, these two scales provide the basis for a demand segmentation model that includes all possible trip/consumer characteristics. If only one fare product is available on all flights in a market, all four segments shown would be forced to purchase that fare product, or not travel at all. Given that a range of differentiated fare products is offered in most markets, we can identify the prominent characteristics of consumers in each quadrant of this segmentation model. The dividing lines between the segments are by no means exact, and each segment still encompasses a wide range of consumer characteristics and trip itinerary requirements.

As such, no single definition of the typical consumer in each segment will apply to all consumers in that group. Nevertheless, the characteristics of most of the travelers falling into each segment can be described as follows:

1. Type 1: Time-sensitive and insensitive to price. These consumers prefer to travel on flights that meet their schedule requirements, and are willing to purchase the highest-priced fare products to do so. They might even be willing to pay a premium price for the extra amenities of a business or first class service. Travel flexibility and last-minute seat availability are extremely important to this group.

2. Type 2: Time-sensitive but price-sensitive. A large proportion of air travelers likely belong to this demand segment. These consumers must make a trip but are willing to be somewhat flexible in order to secure a reduced fare. They cannot book far enough in advance to obtain the lowest fares, although they might be willing to re-arrange a trip to meet less stringent requirements if the savings are great enough. This group is willing to make stops or connections en route, and will accept less convenient flight times.

3. Type 3: Price-sensitive and insensitive to time constraints. These consumers are willing to change their time and day of travel, and even destination airports, to find a seat at the lowest possible fare. Some will be induced to travel by the availability of an extremely low fare. This group is willing to stop or make connections and can meet virtually any travel or ticketing conditions associated with a low fare.

4. Type 4: Insensitive to both price and time constraints. This group includes the relatively few consumers that have little or no time constraints for travel, yet are willing to pay for high levels of service, including the flexibility of flying with little advance notice on preferred flights.For demand segmentation purposes, Type 4 consumers can be combined with the

Airlines abandoned the original two-segment market demand model due in part to a realization that the characteristics of consumer demand for air travel had changed. At the same time that defining demand segments was becoming more difficult, airlines recognized that differential pricing strategies targeted at multiple demand segments offered the potential of even greater increases in total flight revenues.

The greater the number of segments that can be identified and differentiated fare products that can be offered for sale, the closer airlines can come to the idealistic model of a different price for each seat sold. In spite of the practical problems of identifying distinct demand segments, most airlines instituted multiple-tier fare structures.

Ironically, this movement to multi-tier pricing, when combined with increased price competition, actually made it more difficult for airlines to use the differential pricing concept effectively. In fact, it has been argued that the ability of airlines to charge different demand segments significantly different fares has actually decreased since deregulation. With the development of hub connecting complexes and the entry of low-fare airlines, many airline markets receive at least connecting service from several carriers and exhibit substantial price competition. Under these conditions, carriers maintain a multi-level fare structure in name, but are often forced to make a large proportion of their seats available at lower fares without imposing the restrictions intended to differentiate the low-priced fare products and prevent diversion, rather than risking a loss of market share. The strategy of offering only one low-priced fare product, adopted by some new entrant carriers, has further undermined the differential pricing objectives of the major airlines.

The problem of identifying market demand segments and the obstacles to effective differential pricing practices, as discussed, lead to a third way in which the original surplus seat concept has changed. With an almost universal availability and usage of low-priced fare products, the term "surplus seats" may no longer be appropriate in the context of seat inventory control. The original surplus seat concept considered low-fare seats to be a by-product of the airline's operations, which had traditionally been devoted to serving the full-fare passenger. The high proportion of passengers now carried at reduced fares indicates that the original surplus seat concept has been eroded severely. Airlines appear to be providing capacity for low-fare as well as full-fare passengers, in which case the low-fare products are a part of the airline's primary output. If this is in fact the case, economic efficiency would require the low-fare products to contribute in a substantial amount to airline capacity (fixed) costs, in addition to covering their marginal variable costs. The inability of airlines to segment market demand precisely or to charge radically different fares for different products in many markets suggests that such a contribution is being made.

While the differential pricing concepts and demand analysis techniques of the original surplus seat management model are still valid, their application in the current airline marketplace has become substantially more complex. Rather than estimating the demand for a primary product and allocating all remaining capacity to a marginal product, airlines must recognize that each of the several products they offer on a flight makes a revenue contribution to fixed costs. A seat

inventory management system in today's airline environment must estimate the demand for multiple fare products and then allocate seats to each on the basis of the relative revenue contribution of each and the likelihood that seats will ultimately go empty.

Current Airline Fare Structures

A description of the fare products being offered in a particular market at any point in time could well be obsolete within 24 hours. In addition to the complexity of price levels, service amenities and restrictions, airline fare product offerings are characterized by the speed with which they can change. Given complete pricing freedom in domestic markets, U.S. airlines are able to make changes to their fare structures by origin-destination market instantaneously within their own computer reservations systems, and overnight through the Air Tariff Publishing Company (ATPCO). ATPCO routinely handles thousands of individual market changes to fare levels and/or rules in its electronic database each day. It is therefore impossible to present a comprehensive description of current airline fare products that would apply to all markets and carriers, or which would remain valid for any length of time. It is possible, however, to describe the general structure of price levels, service amenities, and purchase/travel conditions that characterize the fare products offered by most major carriers in most U.S. domestic markets. Apart from markets in which price competition is unusually intense due to the presence of a low-cost competitor, and apart from fluctuations in price levels during seasonal system-wide "fare wars", the range of fare products available inmost markets remains relatively stable. The discussion that follows focuses on the stable components of current fare structures, and explores them in the context of the differential pricing and market demand segmentation practices described earlier.

Airlines wishing to segment the total market demand for air travel to their revenue-maximizing advantage must design a range of fare "products" that will appeal to, and be used exclusively by, each of the demand segments. An ideal fare structure will minimize any "seepage" between segments, particularly the diversion of those willing to pay higher fares to the lower-priced fare products. Airlines use restrictions on reduced fares as disincentives to prevent downward diversion of higher fare passengers, and increased service amenities as an incentive for consumers to purchase higher-priced fare products. In fact, the absence of purchase or travel restrictions has come to be regarded as a service amenity of full fare products.

Advance purchase requirements, minimum stay conditions, and round-trip travel requirements have been applied to the lowest fares almost universally since the introduction of super-saver fares in the mid-1970's. While the nature of these restrictions has not changed, the levels of each restriction imposed on particular fare types change often, both with the level of price reduction involved and the degree to which airlines feel they must match competitors in both price levels and fare rules. Airlines have also constrained the use of certain reduced fares with routing and/or flight limitations, day-of-week/time-of-day restrictions and, more recently, cancellation/change penalties.

These restrictions on the purchase and use of low-priced fare products are often accompanied by capacity controls or limits on the number of seats available to particular fares or types of fares.

The specific limits on low-fare seat availability are not known to consumers, and as such are not explicit attributes of different low-priced fare products as perceived a priori by the consumer. Rather, it is the set of conditions and service amenities associated with a fare product that determines the market demand segment to which it will appeal.

Advance purchase and minimum stay requirements are designed to keep Type 1 and 2 consumers from making use of the lowest fares. Since the first super-savers were introduced with a 7-day advance purchase requirement, advance purchase periods have been lengthened gradually, culminating with the introduction by American Airlines in 1985 of the "Ultimate Super-Saver", which requires a 30-day advance purchase. Over the same period, the minimum stay conditions have been reduced to the point that most excursion-type fares now require only a Saturday night away from the originating point before return travel may commence. This requirement replaced previous 7-day minimum stay conditions because airlines found that the reduction led to little or no increase in diversion of high-fare travelers. At the same time, it increased accessibility of the low-fare product to price-sensitive (Type 3) consumers able to stay away over a weekend but not for a full week.

Any fare requiring a minimum stay by definition requires a round-trip ticket purchase. Some moderately reduced fare products currently have only a round-trip purchase requirement, perhaps in conjunction with an advance purchase condition.

The three traditional fences - advance purchase, round-trip travel and minimum stay - are effective against diversion only if they are enforced by the airline. While it might be possible for consumers to side-step an advance purchase requirement by dealing with a travel agent who is willing to backdate ticket issuance transactions, the minimum stay rule is also susceptible to abuse by travelers. Many airlines allow a passenger to stand by for the return portion of a round-trip reduced fare, and some passengers will routinely stand by for the inevitable empty seat on return flights, never having had the intention of meeting the fare's original minimum stay conditions. Although it is up to the airline ticket and gate agents to prevent such abuse, few agents will deny a passenger with a ticket as long as empty seats remain on a departing flight, especially if the passenger was ticketed originally for a competing carrier's flight.

The abuse of both the minimum stay and advance purchase requirements, primarily by Type 1 and 2 consumers, prompted airlines to introduce monetary penalties for changing or cancelling flight bookings for the lowest fares. The objective of these penalties is to prevent those passengers who are unable to commit to exact departure and return flights far in advance from purchasing several advance purchase low-fare tickets, using the one that proves to be most convenient, and then obtaining a full refund for the unused tickets. The imposition of a monetary penalty also makes it more difficult for passengers to confirm reservations for an alternate return flight without being asked for an additional fare payment by the airline, although it is still possible to stand by without penalty in many case& non-refund ability of tickets for the lowest-priced fare products was implemented industry-wide in early 1987 with the introduction of "MaxSaver" fare products by the Texas Air Corporation. The introduction of total non-refund ability represented both an additional restriction designed to prevent diversion of passengers

from higher-priced fare products and an opportunity for airlines to reduce the revenue impact of passenger no-shows and cancellations. With a 100 percent cancellation penalty imposed on their lowest fares, most major carriers extended cancellation penalties of 50, 25, and 10 percent to their less restricted and higher-priced fare products.

Advance purchase, minimum stay and cancellation/change penalties enable airlines to prevent the diversion of Type 1 and 2 consumers to the lowest fares. Several other types of fare product restrictions have also been used by airlines to target individual market segments more precisely, particularly in distinguishing Type 1from Type 2 consumers. Non-stop/connecting flight, day-of-week and time-of-day limitations on certain reduced fare products can be found in most domestic markets.

A price-sensitive consumer planning a trip with little time sensitivity will likely accept all three of these constraints on his/her travel itinerary in order to obtain the lowest possible fare. The degree to which a time-sensitive and price-sensitive (Type 2) consumer is able to conform will depend on how price-sensitive he/she is, and the degree to which the restrictions impinge on the desired travel times. Survey findings indicate that, apart from advance purchase conditions, restrictions limiting the availability of low-fare products to particular travel days and/or times are the most effective market demand segmentation technique [201. In addition to performing a demand segmentation function, time of travel restrictions also help the airline to fulfill another goal of the original differential pricing strategy - spreading peak period demand to fill otherwise empty seats on less popular flights. The availability of the lowest 30-day advance purchase fares for travel on Tuesdays and Wednesdays, for example, helped to reduce day-of-week variation in total demand tremendously.

The limitation of certain reduced fares to one-stop or connecting service only is an example of how airlines practice value-based pricing and product differentiation. Booking, handling and carrying a passenger on more that one flight leg or over a circuitous routing will cost the airline more in variable costs than putting the same passenger on a non-stop flight. As long as seats are available for both itineraries, there is little cost-based rationale for charging $520 for an unrestricted non-stop fare from Boston to Los Angeles and $250 for an unrestricted (but capacity controlled) one-way fare that is available only on one-stop or connecting flights in the same market. These two fare products are targeted at Type 1 and 2 consumers, respectively. The latter is more likely to accept a longer travel time to save over 50 percent of the full coach fare, and to change flight times and/or carriers if the capacity-controlled low-fare seats are sold out on the first flight(s) requested. The fare conditions described above are all "fences" designed to differentiate fare products and prevent diversion of passengers whose service sensitivity causes them to view fare products with such fences negatively. Airlines have also used positive forms of product differentiation to segment market demand. First class and business class services priced at a premium above the full coach fare are targeted at consumers with little or no price sensitivity. While first class service has existed for decades, the concept of an intermediate class between first and coach in terms of in-flight service amenities has emerged since deregulation and is yet another attempt by airlines to segment total market demand more precisely.

Business class options are offered in almost all international markets by most airlines, where long-haul flights make more legroom and a higher level of inflight service very attractive to those already paying a full coach fare. Trans World Airlines offers its Ambassador Class product domestically as well, on its wide-bodied aircraft. Air Canada has recently introduced a similar Executive Class on long-haul domestic and Canada-U.S. routes. Both carriers price their business class products just slightly above the full coach fare, such that the premium is generally less than 10percent. In many respects, these business class products have replaced the standard full-fare coach products designed originally for business travelers. Several carriers have also experimented with providing full-fare coach passengers with added service amenities, ranging from separate check-in counters and VIP lounge privileges at airports to complimentary ground transportation services.

United Airlines at one point guaranteed that a full fare passenger would not be denied boarding due to overbooking and, more recently, stopped giving advance seat assignments to passengers with the lowest discount fares. While U.S. carriers have met with resistance from passengers and travel agents in their attempts to enhance the full coach fare product, Canadian carriers have been doing just that for years. The use of an increasing variety of low-fare restrictions and the inclusion of service amenities with full fare tickets represent attempts by the airlines to differentiate the range of fare products they offer, particularly those that will share seating in the coach compartment of the aircraft. Significant product differentiation is a major determinant of effective demand segmentation, which in turn allows the airline to practice differential pricing to maximize revenue.

Unfortunately, this type of ideal fare structure can be found in very few markets. If one is found, it is unlikely to remain stable for any length of time. With the growth of hub-oriented route systems, most domestic markets are now served by several airlines, and the choice of carriers in a market often includes at least one low-fare, single-product competitor. Even if the price leader does not offer a level of service in a particular market, experience has shown that most of the competing carriers will match the low price with a similar product. Furthermore, sporadic "fare wars" and regional price battles serve to undermine the possibility of offering a standardized differentiated range of fare products in all markets. It is under such circumstances that airlines and consumers alike marvel at the complexity and incomprehensibility of airline industry pricing practices.

It is possible, nonetheless, to develop a generalized fare product typology that is representative of the range of fare products found in most domestic markets in the spring of 1987. Figure 1.4 shows the typical fare product categories offered by airlines, the primary market demand segments targeted by each product, as well as the service amenities, restrictions and relative price levels of each. Similarly, carriers might not offer all the product categories listed in markets where there is little effective competition.

First class, business class and full coach fare products are targeted at the Type 1 consumer, and are differentiated only by their service amenities and relative price levels. The most important attribute of all three of these fare products is their lack of restrictions. A passenger may purchase

a ticket at any time prior to departure and make virtually unlimited changes to both the outbound and return flight itineraries, all without paying a penalty. At any time, unsold seats will always be available to passengers purchasing these unrestricted products.

Super coach fares and excursion fares are moderately priced products targeted at the Type 2 consumer. Super coach fares appear primarily in markets where a low fare competitor offers unrestricted fares below the established coach fare. Depending on the extent to which a carrier wants to respond to the low-fare competitor, it might attach a minimal (3-day) advance purchase requirement or a one-stop/connecting flight limitation to its super coach fares to prevent Type 1 consumers from diverting to this lower fare. Most of the established carriers place capacity controls on their super coach fares to keep some seats available for full coach 'fare passengers right up to departure time. Fare bases are grouped by the airline into fare classes for the purpose of Accepting and controlling bookings in its reservations system. Ideally, the reservations system fare classes would correspond exactly to the fare product categories described above, such that distinct seat inventories could be made available for each category. Most airline reservations systems, however, are limited to five primary fare classes for any one flight. The implications of this limitation for seat inventory control are discussed in Chapter Three. At this point, it suffices to note that airlines offering more fare product categories than they have reservations system fare classes must combine more than one product category into one fare class.

All the fare basis codes that comprise a particular fare class begin with the same letter, by convention. As a historical rule, separate physical compartments on an aircraft have been assigned their own fare class. Thus, a carrier offering first and business classes in addition to coach uses up three of five fare classes on Type 1 fare products. The letter codes used for each fare class can differ by carrier, although "F" for first, "C" for business and "Y" for full coach fare are industry standards. The lowest-priced fare products are commonly in Q-class, while all intermediately priced fare products might be listed as M, B, K, V, S, L, or H-class fares. Because not all fare products and fare classes are associated with distinct physical compartments on board the aircraft, passengers booked in two or more fare classes can in fact receive the same class of service in flight. On most carriers, all passengers paying full coach fare and less travel in the coach cabin of the aircraft and receive identical on-board service.

A summary of the relationship between market demand segments and airline fare structures as described in this section is provided in Figure 1.5. Note that each airline has flexibility with respect to which fare basis codes it groups into one fare class. Seat inventory control is necessarily related directly to the reservations system fare classes, as defined by each airline, since only the seats made available to a fare class "inventory" can be controlled. The airline must decide how many of the total coach compartment seats on a future flight it should make available to each of the fare classes sharing that compartment.

For the consumer wishing to make a reservation for a future flight, the availability of a specific fare product on the preferred flight departure depends on the availability of a seat in the associated reservations fare class inventory. If the fare class has been closed down to further reservations, the consumer is then faced with the option of accepting a different fare product in

another fare class on the same flight or making inquiries into the availability of the same or similar fare product on other flights and/or carriers.

CONSUMER DECISIONS AND AIRLINE TRAVEL DEMANDS

The availability of differentiated fare products, each associated with specific amenities, travel conditions and price levels, has changed the way in which consumers make air travel choices. Because many fare products are associated with restrictions that relate directly to the timing and nature of the trip being considered, consumer decisions with respect to air travel have become more closely tied to the total cost to be incurred on a trip. The consumer no longer buys a ticket for air transportation between A and B independent of other trip-related decisions.

Selecting a particular fare product over another can have a significant impact on the total cost and timing of the trip. This chapter explores the consumer decision process that has evolved with the institution of multiple-tier pricing strategies by airlines. With reference to classical micro-economic utility theory, it presents a conceptual model of how individuals choose from among the available fare products, alternative flights and competing carriers in an air transportation market. This choice process for individual consumers is then used to develop a description of the aggregate demand for a fare product on a particular flight, as viewed by the airline through its reservations system. The patterns of reservations demand described by the aggregate model are those that will influence the airline's ability to forecast demand and allocate seats to different fare products in a revenue-maximizing manner.

Individual Consumer Choice

A plausible model of individual choice for air travel decisions is one that is based on a valid theory of consumer decision-making and one which can be adapted to the context of transportation decisions in general and air travel options in particular.

This section begins with a brief overview of the decision theories that seem to be best suited to the air travel choice problem, and then extends these theories into a qualitative choice model that deals explicitly with the selection of fare products and flights.

Classical micro-economic consumer theory makes use of the notion of individual utilities to explain the choice behavior of consumers faced with a range of goods and a limited budget to spend on these goods. Consumer choice models based on the criterion of utility maximization assume that each individual, when confronted with a choice between "bundles" of goods, is able to compare alternatives and rank them in terms of his or her personal preferences. By using this "ordinal utility function", a rational consumer will then choose the bundle with the maximum perceived utility. An important component of classical consumer theory is the assumption that each individual undergoes a rational decision process in making each and every choice of goods before making a purchase. This rational process requires the consumer to formulate explicitly his/her preferences for all possible combinations of goods that can be purchased, to identify all the alternatives that are available, to characterize each alternative in terms of its attributes and the weights assigned to each attribute, and to select the alternative yielding the greatest utility. The

rigid definitions of this rational decision process were relaxed by Simon, who introduced the notion of bounded rationality, recognizing the constraints on rational decision-making imposed by limitations on both information availability and human capabilities to process large amounts of information. A further relaxation of the underlying behavior in individual choice involved the concept of random utility, which takes into account the observation that individuals tend to choose the alternative that appears to maximize utility at the time the decision is made.

Regardless of how rigidly we interpret the notion, utility maximization seems to be a reasonable basis for the development of an individual choice framework for air travel decisions. Several other components of the classical micro-economic model of consumer choice can also be incorporated into this framework, although modifications to account for the unique nature of transportation demand are required.

Most important of these is the derived nature of transportation demand. That is, few individuals travel for the sake of travel itself. They travel to be at a particular place at a particular time. The benefits associated with travel are thus almost entirely attributable to the activities to be undertaken at the destination. Travel itself imposes costs or disutilities which must be incurred to realize the benefits of the trip.

A related characteristic of transportation is that it is purchased not for its quantity, but rather for its attributes. This is also true of many commodities, but is particularly applicable to transportation. As mentioned in the previous chapter, consumers do not purchase a quantity of seat departures or available seat-miles as if they were a commodity. A trip taken by air consists, at a minimum, of a departure time from a specified origin and an arrival time at the desired destination. With respect to individual choice, the attributes of a particular travel option are what generate disutility. The disutility of a travel option will depend on the nature of the planned trip, the characteristics of the trip-maker, and on the attributes of the other available travel choices for that trip.

The "price" of a travel option is therefore not simply the monetary cost of the ticket. Various travel options can involve additional dis-utilities and monetary costs associated with the timing of the travel components of the trip, as well as the value of the time actually spent traveling. Given the derived nature of transportation demand, consumers will want to minimize travel time, cost, discomfort and inconvenience for a trip with a given level of perceived benefits. The concept of utility thus represents a generalized function that takes into account the pleasant and unpleasant components of making a trip and can form the basis of consumer choice.

The benefits of being at a destination are generally independent of the attributes of the available travel options. Travel choice depends on the minimization of the dis-utilities of traveling to the desired destination. The value of the utility function for a particular travel alternative is a measure of the degree to which that alternative is desirable to the consumer, relative to other alternatives. The utility function reflects trade-offs that the consumer is implicitly or explicitly using to compare the attributes of the various travel alternatives.

A descriptive model of individual choice for the air travel decision process must take into account not only the availability of heterogeneous alternatives, but the fact that individual decision-makers will have different choice sets and can assign different utility values to the same attributes of the same alternative. The choice set for each individual will include the alternatives that are feasible to him/her, given the constraints on trip timing and costs. This choice set might only include a few alternatives if the consumer is unable or unwilling to obtain information about more options, or if the first option considered is found to be acceptable.

The air travel choice process for an individual is triggered by a perceived benefit of being at a particular destination to participate in activities there. The individual evaluates the travel options available for a given trip, and the costs or disutilities of each. If the benefits of being at the destination exceed the disutility of one or more travel alternatives, the alternative that minimizes disutility will be chosen. If the travel disutility of all alternatives exceeds the perceived benefits at the destination, the individual will choose not to make the trip.

We begin the development of a choice framework by assuming that the consumer wishes to select one of three fare products, F1, F2, F3 , offered on a single flight which happens to be the consumer's preferred flight. That is, we assume that the expected benefits of making the trip have been determined, the desired departure time and airline have been established, and the consumer must only choose among three fare products, all of which are available. With reference to the above discussion, we can postulate that the consumer will choose the fare product that minimizes his or her disutility of traveling to the destination.

Each fare product is defined by its attributes, which contribute to the total disutility of that fare product. Negative attributes create added inconvenience for the traveler, resulting in real or perceived costs that are higher than the dollar price paid for the fare product. The relevant attributes of each fare product may be grouped as follows:

1. Price, (P), the dollar price charged for fare product F;

2. Service Amenities, (S;), the positive attributes related to the quality of service received in conjunction with the purchase of F;. On-board service amenities such a meal quality, complimentary cocktails and headsets, and preferred seat assignments can differ among fare products, as can airport amenities like separate check-in facilities and VIP lounge privileges. Currently, the fare products offered by many domestic U.S. airlines in a shared economy cabin involve few distinctions in service amenities.

3. Restrictions, (X;), the conditions associated with F;, including required advance booking and ticket purchase, cancellation and refund ability limitations, effective and discontinued dates, minimum and maximum stay requirements, and applicability to particular times, days of the week and/or flight itineraries.

Fare products priced lower than the standard full fare generally have one or more of these restrictions, the severity of which increases as the price decreases. The total disutility of each fare product under consideration can be represented by the notion of its "generalized cost",

denoted Z(F) for fare product Fi. The generalized cost of each fare product to the consumer will be a function of its attributes, for example:

$$\mathbf{Z(Fi) = Z(Pi,S,Xi)\ (2.1)}$$

Each passenger will place different values or utilities on the relative importance of each of these attributes in deriving the generalized cost of each fare product option, depending on his or her set of values, as determined by both the price-sensitivity of the individual and the time-sensitivity of the trip being considered. The relative values of Z(F), Z(F2), and Z(Fs) may be different, requiring each individual to evaluate and rank the alternatives with respect to generalized cost, in order to identify the fare product that minimizes perceived disutility.

The consumer begins the process of obtaining information (from a travel agentor from the airlines directly) about the actual alternatives that might be available for a particular trip. The specific way in which this choice set is developed will depend on the consumer's approach to selecting particular flights. For example, an infrequent air traveler might contact a travel agent to determine which flights and fare products are available. A more experienced air traveler might establish a choice set of preferred flight alternatives from published airline schedules before determining the availability of fare products on each.

Depending on the amount of information the consumer is willing to gather, this choice set might include as few as one or as many as tens of alternatives. If the first alternative determined to be available comes close enough to the "ideal" departure times for the individual and a fare product at an acceptable price level is available, other alternatives might not even be considered. If, on the other hand, the consumer is willing to gather additional information in an effort to find alternatives with aa lower generalized cost, the choice set can keep growing in size. Presumably, the consumer is ranking the alternatives as they enter the choice set, or at least keeping track of the alternative with the lowest disutility.

Given that particular fare product/flight combinations might be "sold out" or simply infeasible, the disutility associated with an alternative must include the costs related to the entire "travel alternative". Each alternative, T, represents a set of trip components, including an outbound flight itinerary, D, a return flight itinerary, R, and a fare product, F, the attributes of which were defined earlier. The D and R components of a travel alternative represent the attributes of a particular flight itinerary for outbound and return travel, respectively. These attributes include the actual flight departure time, td, relative to the "ideal" departure time, t;, as determined by the consumer, and the enroute time of a particular flight itinerary, ti,, which is a function of the number of stops and connections, and the routing taken. The generalized cost of a particular outbound flight itinerary, D, can therefore be defined as:

$$\mathbf{Z(D) = Z(Itd - tdIter)\ (2.2)}$$

The expression for Z(R) will be identical. Each travel alternative consists of three components, T = {F, D, R}, each of which contribute to the generalized cost of the alternative. Each travel alternative must consist of a feasible combination of fare product, outbound and return flight

itineraries. The restrictions associated with a particular fare product, X;, might constrain the combinations of D and R that may be included in the choice set. For example, an outbound flight next week cannot be combined with a fare product that requires a 30-day advance purchase into a feasible air travel alternative. The restrictions on a fare product could also exclude specific D or R components, for example, by requiring the fare product to be used only on connecting itineraries.

Given a range of outbound and return flight itineraries offered by competing airlines in a market, there is a large number of air travel alternatives, T = {F, D, R},that can be constructed from the components F, D, and R. In terms of individual choice, however, all but a relatively small subset of these combinations will be eliminated by the timing constraints established by the consumer for a particular trip.

These constraints are determined by the "time window" established for activities at the destination, over which the traveler will be able to realize a benefit, as well as by any time constraints on being away from the origin. For each individual, then, the generalized cost of each travel alternative is a function not only of Z(F;), but of the disutility of the D and R components of the alternative:

$$\mathbf{Z(T) = Z\{F, D, R\}} \quad \mathbf{(2.3)}$$

The generalized cost of the F component includes the dollar price, Pi, of the fare product, and the disutility of meeting all of the restrictions, Xi, of that fare product, perhaps adjusted by the utility of any differences in service amenities, S;, associated with the fare product. The generalized costs associated with both the D and R components include the dollar costs and disutilities of displacement from the "ideal" flight departure times, ltd - td, and of enroute time, t,. These costs can include monetary expenditures in addition to the value of travel time, for example, increased hotel or meal expenditures.

The critical assumption of the choice model developed here is that individual passengers implicitly (or perhaps explicitly) rank the set of feasible air travel packages in their choice set with respect to the relative disutility of each. As mentioned earlier, an individual might not consider a full range of alternatives and is likely to seriously consider only the current option with the lowest disutility. The choice process can therefore be iterative, in that the consumer can be induced to expand his/her choice set as information about the (un)availability of preferred travel alternatives is gathered. The availability of a particular D or R component depends on the airline having seats to sell over the flight itinerary in question, in the fare class inventory from which fare product F must be sold. The ultimate choice is made by the consumer so as to minimize the total disutility of the travel required for a particular trip, subject to the availability of each successively less attractive travel alternative.

As an example, consider the hypothetical choice set {T 1,T 2, .--,Tn} as a list of feasible travel alternatives formulated by an individual, ranked in increasing order of disutility. Similarly, DI,...,Dn and R 1,..., R,, are the ranked outbound and return flight itineraries, while P and F2 are the relevant fare products offered on these flights. If the consumer prefers F1 to F2, then the rule

of dominance dictates that the first choice of options for this consumer would be Ti = {F1 , DI, R1}. The first six travel alternatives in this hypothetical consumer's ordered choice set might look like this:

Ti = {Fi, Di, Ri} (2.4)
T2 = {F1, Di, R2}
T3 = {F 1,Di,Rs}
T4= {Fi, D2, R1}
T = {F2 , Di, Ri}
T6 = {F2, Di, Rs}

We can infer from this ordered choice set that, for this hypothetical passenger, the marginal disutility of accepting the second and third-ranked return flight itineraries is smaller than the marginal disutility of accepting the second choice of outbound flight itineraries. Only after determining that D2 is not available at F1 will this consumer accept what is most likely a higher-priced F2, but only on the first choice outbound and return flight itineraries. T6 illustrates how a shift in the fare product component of the air travel alternative might rule out one or more flight itineraries (in this case R2). The restrictions associated with F2 might eliminate R2 as a component of a feasible travel alternative. Note that the relative disutilities of F, D, and R are determined in combination by the individual, meaning there need not be a systematic ranking of the separate trip components. The individual chooses the highest-ranked travel alternative that he is aware of at the time of booking or ticket purchase, subject to the feasibility and availability of the various combinations. Given that one or more alternatives might not be available because all F seats have been sold on the D or R components of the trip alternatives in question, the choice process is simply one of systematically checking each ranked travel alternative in ascending order of disutility until a feasible and available combination is found.

The extent to which an individual is willing to accept a lower-ranked travel alternative will be a function of the generalized cost of that alternative relative to the perceived benefits of being at the destination point. If we define the total of these perceived benefits to be W, then the individual will make the trip as long as the generalized cost of the highest-ranked feasible and available travel alternative, T*, is less than W. That is, the trip will be made only if: $Z(T^*) < W$ (2.5) If more than one feasible and available travel alternative has a generalized cost less than W, then the individual will choose T* so as to maximize $W - Z(T^*)$. The value of W for a particular trip thus establishes a "cut-off point" in the set of ranked alternatives, below which an alternative will not be accepted by the consumer even if it is available. At this point the disutility of the travel alternative, due to displacement from preferred flight times and/or much higher monetary costs, is so great that the trip itself becomes of no value to the individual. The location of this cut-off point on the ranked list of alternatives will be determined by the characteristics of the trip and of the consumer, as defined by the market demand segmentation criteria described in Chapter One. That is, each Z(T*) is a function of the time-sensitivity of the trip in question and of the price-sensitivity of the individual with respect to that trip.

The criteria that define the market demand segments also affect the willingness of the individual to accept lower-ranked trip alternatives and the disutilities of shifts in the F relative to the D and R components. For example, a consumer wishing to take a trip for business purposes to attend a

meeting at a specified time and who cannot depart before a certain time nor return after a certain time will place a greater disutility on accepting lower-ranked flight itineraries than lower-ranked fare products. In the demand segmentation model, this trip would be classed as time-sensitive, and the consumer would be relatively insensitive to price.

Although we assumed initially that the consumer is indifferent between competing airlines, different flight itinerary components could in fact represent travel on different carriers. If the relative utilities of different flight itineraries are judged to be different by the consumer on the basis of attributes other than those associated with D or R, as defined above, the consumer exhibits a preference for one carrier over another. Such a preference can be incorporated into the fare product (F) component of the trip package, and will be reflected in its generalized cost through the level of service attributes (Si) associated with a fare product offered by a particular carrier.

To distinguish fare products offered by different carriers, we can define F; to be fare product i offered by carrier k. The generalized cost of Fit is then given by: Z(Fik) = Z(Pa,X;,SI) (2.6)

This formulation allows for the possibility that similar fare products offered by competing carriers in the same market will have different price levels and/or different restrictions, in addition to any perceived differences in service amenities. A preference for a particular carrier on the basis of "brand loyalty" or frequent flyer program considerations can also be reflected in different utilities assigned to Sik for the same fare product offered by different carriers.

If the values of Z(Fik) are determined to be different for the same fare product offered by different carriers, the consumer would then select the fare product/carrier combination that minimizes Z(Fk), with all else being equal. It is more likely that distinguishing between identical fare products offered by competing carriers will involve different D and R components in the travel alternatives being considered.

The consumer must then take into account the relative disutilities of the different flight itineraries on different airlines. It is possible that increased disutility of the D and R components involving the preferred airline will be outweighed by the lower value of Z(Fik) relative to that of other airlines. That is, the utility of traveling on the preferred carrier can exceed the disutility of less convenient flight itineraries.

The individual choice process for air travel described in this section relies heavily on the notions of relative utilities and rational consumer behavior. It is important to emphasize, however, that very few potential air travelers will undergo an exhaustive enumeration and evaluation of alternatives before making a completely informed utility-maximizing choice. As mentioned, the number of alternatives considered and the way in which information is gathered can lead to the consumer making a less than optimal choice. Nonetheless, the choice process described remains validinsofar as the consumer will select the trip package alternative providing the lowestperceived disutility from among those considered, given feasibility and availability ofthat alternative.

It should also be emphasized that the framework presented here is a qualitative description of individual consumer choice in the context of current airline marketing and pricing practices. Development of quantitative models of individual choice for air travel would require empirical research that is well beyond the scope of this dissertation.

This qualitative choice model is important, however, to an understanding of the reservations process as viewed from the airline's perspective. To understand aggregate reservations patterns, we must understand the individual choice process that generates these patterns.

Airline Reservations Framework

In accepting a passenger's reservation, the airline decrements the inventory of seats available in one of the fare classes established in its reservations system. Seat inventory control techniques are used to place limits on the maximum number of bookings that may be accepted in each reservations fare class. The aggregate outcomes of the choice process of individual consumers are thus viewed by airlines in terms of reservations totals and booking patterns by future flight leg and fare class.

The objective of this section is to extend the model of individual choice, given a reservations system that presents available fare product and flight itinerary alternatives to the consumer. If all fare products were always available, aggregate demand for each fare class on each future flight leg to be operated by an airline would be the sum of all requests from potential passengers for whom the relevant travel alternative {F, D, R} ranks first in perceived utility. In reality, there is a limited number of seats available for each alternative in the choice set. Requests for different alternatives arrive over time before flight departure. If either the D or R components of an individual's preferred travel alternative are unavailable in conjunction with the desired F at the time the request is made, the potential passenger will be forced to consider and perhaps accept successively less desirable alternatives from his/her ordered choice set. For the airline, each shift by a potential passenger from one travel alternative to the next has important implications with respect to total bookings and expected revenues for future flights.

The airline receives a request from a potential passenger for a particular outbound flight (D), return flight (R), and fare product (F). If the passenger's preferred travel alternative is not available in its entirety, the passenger consider the next-best alternative. This next-best choice will include one or more components different from those in the initial alternative requested. Depending on which of these components change in the shift to a less desirable alternative, the impacts for the airline will differ.

If the next-best choice includes a different P component but identical D and R components, the potential passenger is willing to accept a fare product, with its price, restrictions, and service amenities, that has a higher generalized cost in favor of keeping the outbound and return flights of the initially requested alternative.

For most passengers, a shift to the next-best alternative will mean a shift to a higher-priced fare product, given no change in the flights involved. Extremely price-sensitive passengers would of course be more willing to shift flights than accept a higher fare.

For the airline's purposes of seat inventory control, it is the upward shift in the fare product component associated with the next-best alternative in the consumer's choice set that is of most interest. Given the objective of maximizing total flight revenues, the airline must consider the possibility that a passenger denied a reservation in a low fare class will be willing to step up to the next highest available class for the same D and R flight itineraries. Stepping up to the next highest fare class represents what we shall call a vertical shift or "upgrade" in the reservations request, from the airline's perspective. Such a shift is desirable for the airline, since no potential traffic is lost and total revenues actually increase.

Unfortunately, not all potential passengers will be willing to make this vertical shift when denied a reservations request, depending on the composition of the next-best travel alternative in their ordered choice sets. Those not willing to accept a vertical shift might be willing to accept different departure and/or return flight components in their trip packages but with the same fare product component as the one requested initially. This will be the case for extremely price-sensitive passengers (Type 3) in particular. For the airline denying a reservations request, then, the probability that the denied passenger will make a vertical shift in his/her choice process is directly affected by the passenger's price-sensitivity and changes in the utility of the fare product components between the first-ranked and next-best alternatives.

If a passenger's request for a particular travel alternative is denied, the next best choice might involve the same fare product component, but a different departure and/or return flight itinerary. Acceptance of the next-best alternative in such a case can involve a shift of flights and/or carriers. If the passenger selects the same fare product for another flight on the same airline, the airline retains this passenger's business and revenue. Furthermore, the airline may sell seats that would otherwise have gone unsold on lower demand flights. This type of movement in the passenger's choice process can be termed a horizontal shift in preference, or "displacement" of the passenger from the originally requested flights.

The passenger denied a request and unwilling to accept a higher-priced fare product might instead select a departing and/or return flight involving a competing airline in the same market as his/her next-best option. This shift results in a loss of business and revenue to the denying airline, meaning it represents a booking lo8, or "defection" to another carrier. A booking loss would also result in cases where the denied passenger has reached the cutoff point of disutility in his ordered choice set and decides not to make the trip. In either case, the denying airline loses a customer.

A passenger denied a request for a preferred travel alternative, regardless of how far down the ordered choice set it may be, will therefore always take one of three actions, resulting in three distinct impacts on the airline reservations process. A denied request will lead to one of the following consumer reactions:

- a vertical shift, v, ("upgrade") from one fare class to another, on the same outbound and return flights as those requested initially;
- a horizontal shift, h, ("displacement") to different outbound and/or return flights, but on the same airline and in the same fare class as requested initially;
- a booking loss, 1, either to another competing airline ("defection") or to a decision not to travel.

Of these reservations "responses" by consumers, vertical and horizontal shifts are clearly desirable from the perspective of the airline denying the original reservations request. A vertical shift will result in increased revenues, while a horizontal shift enables the airline to retain the potential passenger's revenue without accepting another reservation on a heavily-booked or high-demand future flight in the requested low-fare class. The combination of vertical and horizontal shifts by denied passengers has been termed "recapture" by American Airlines [30]. The probability that a denied passenger will shift either vertically or horizontally on the same airline is thus the "recapture rate".

For the airline deciding whether to accept or deny a particular request for a fare class and flight, the magnitudes of these probabilities are extremely important, especially P(l). Recapture eliminates the losses associated with refused requests. American Airlines has developed a model of reservations recapture and has made attempts to measure it. Their theoretical model assumed that "recapture can be estimated by redistributing demand from a closed or cancelled flight based on passenger preference models."

Validation of such a recapture model requires observation of actual recapture rates, and American has found it difficult to measure recapture behavior accurately. A preliminary survey involving intervention in actual telephone reservations transactions was undertaken, but only 30 sample points were gathered. The results of this limited survey showed that:

1. passengers were "extremely flexible" in terms of flight times;

2. fares were more important in determining recapture than schedules;

3. very few passengers were aware of or asked for specific flights. American's preliminary estimate of overall recapture rate was about 30 percent of denied requests.

The problem with these observations concerning recapture rate, apart from the small sample size and the drawbacks associated with inferring passenger behaviorfrom a telephone transaction, is they do not recognize that recapture rates will differ depending on the market demand segment characteristics of the passenger involved. The willingness of a potential passenger to shift vertically or horizontally from the travel alternative requested initially will depend on the passenger's price sensitivity, the time sensitivity associated with the benefits of the trip, and on the specific point in the passenger's ordered choice set at which the reservations request is denied.

We can extend the individual choice model presented to incorporate the choice shifts that occur when a preferred travel alternative is not available. The objective is to "explain" the relative

probabilities of each type of choice shift described earlier, with reference to the travel dis-utilities of the attributes of different travel alternatives, as evaluated by the consumer. The choice shift that an individual makes will be determined by the specific alternative(s) being considered in place of the unavailable alternative and the disutility associated with the change in one or more components of the travel alternative. The expected choice shift is therefore a function of the time constraints on the trip involved and of the price-sensitivity of the consumer for this trip, which in turn define the demand segment to which the consumer belongs over the course of the choice process for the trip at hand.

For any one denied reservations request, the choice shift that will be made by the consumer depends on the composition of the "next-best" travel alternative. This next-best alternative may be the one that offers the smallest increase in travel disutility over the unavailable alternative, as derived from a ranked set of alternatives by a completely informed consumer. In practical terms, the "next-best" alternative is often an alternative selected by either the airline reservations agent or a travel agent as being potentially acceptable to the consumer. In many cases, the consumer's ordered choice set will consist of as few as one alternative presented to him/her as being the "next best" option. If the consumer believes an alternative with a lower disutility than that of the alternative being presented might be available, the suggested "next best" option will be refused. The consumer will then call another airline, or deal with another travel agency.

The airline that is unable to accommodate a passenger with his/her preferred or requested travel alternative can offer the passenger a higher-priced fare product for the same flight itineraries, D and R, as those requested, or different flight itineraries for the same fare product, F, requested. The probability that the consumer will accept either of these two next-best options is the recapture rate, RR. The recapture rate reflects the expected choice shift behavior of similar passengers in similar situations. The choice shift behavior of each individual is determined by that individual's evaluation of the relative dis-utilities of the next-best alternatives presented to him/her.

We examine first the simple case in which the consumer deals directly with only one airline, and assume that no competing airlines are involved in the choice process. When this consumer is denied a reservations request for a preferred travelalternative, the airline will offer one or more "next-best" alternatives, different from the preferred alternative in the fare product component and/or one or both flight itinerary components. Given a next-best travel alternative which differs from the initially requested alternative only in terms of the fare product component, the consumer will accept this alternative only if the disutility of the change in fare product components is less than the increased disutility associated with all other known next-best alternatives. If no other alternatives are being considered by the consumer, or if no other alternatives are available, the next-best alternative will be accepted as long as the increased disutility of the new fare product component does not increase the total disutility of travel to the point that it exceeds the perceived benefits of the trip.

With reference to the notation introduced previously, a shift in the fare product component of a travel alternative from F1 to F2 on the same airline for identical flight itineraries will involve an increase in travel disutility for the consumer equal to:

Z(F 2) - Z(F) (2.9)

This increase in disutility will be a function of the price difference between the two fare products, any changes in the restrictions involved, as well as any perceived or actual changes in service amenities:

Z(F2) - Z(F) = Z(P2 ,X 2 ,S 2) - Z(PiX 1 ,S 1) (2.10)

Given only the option of accepting the less desirable fare product component or not making the trip, the consumer will make a vertical choice shift ("upgrade") if:

Z(F 2) - Z(F1) < W - Z(T) (2.11)

where Ti is the initially requested (first choice) travel alternative and W represents the total perceived benefits of making the trip.

We now consider the case in which a consumer is presented one "next-best" alternative with different D and R components but an identical F component as that in the unavailable alternative. The increased disutility of the change in flight itineraries will be a function of the increased displacement from the consumer's "ideal" flight departure times and any changes in en route times, including perhaps the added inconvenience of making a connection. For a horizontal shift from Di to D 2 and from R1 to R2 , the increased disutility of the next-best travel alternative is given by:

Z(D2, R2) - Z(Di, RI) (2.12)

where the disutilities of each of the four travel components in the above expression are a function of Itd - t;I and t,..

As was the case with an isolated vertical shift, the consumer presented with only the option of making the specified horizontal shift or not traveling will accept the changes in the D and R components of the travel alternatives as long as:

Z(D2, R2) - Z(Di, Ri) < W - Z(T 1) (2.13)

Note that a horizontal shift can involve a change in either D or R, or both. Even if the same R component is included in both alternatives, for example, the disutility of the R component can change when it is paired with a different D component.

The disutility of a travel itinerary is thus expressed as a non-separable function of both flight itinerary components.

Even when a consumer calls an airline directly, the "next-best" alternatives presented to him/her are unlikely to be this limited. The airline is more likely to present two or more options from

which the consumer may select one. The set of options presented will generally include a vertical shift for the same flight itineraries as those requested, along with one or more horizontal shift options to other flight itineraries offered by the same airline, for which the preferred fare product is in fact available. Presented the option of making a vertical choice shift or a horizontal choice shift on the same airline, the consumer will select the alternative that provides the smallest increase in travel disutility, subject to an upper limit on this increase,

Passengers belonging to the Type 2 demand segment are assumed to be relatively price sensitive although the trips they are planning are associated with time constraints. Given this sensitivity to both price and time displacement, it is difficult even to speculate about the relative levels of P2(v) and P2(h). And, given that the Type 2 demand segment definition can apply to a variety of consumers and trips, any estimates of these probabilities will be subject to substantial uncertainty.

The market demand segmentation criteria of price and time sensitivity can also be used to postulate relationships between the probabilities of vertical and horizontal choice shifts when consumers belonging to different segments are presented with the same "next-best" travel alternatives.

These relationships should hold when considered separately, with other factors held constant. That is, when presented with the same set of "next-best" alternatives to one that is not available, a typical Type 1 passenger will be more likely to make a vertical choice shift than a Type 2 and, in turn, a Type 3 consumer. Similarly, Type 3 consumers will be most likely to make horizontal choice shifts, followed by Type 2 and Type 1 consumers, respectively.

Although horizontal and vertical shifts enable the airline to retain, or even increase, the revenue it receives from a denied passenger, airlines in competitive markets must be more concerned with P(l), the probability that a denied request will cause the consumer to take a seat on a competing carrier, or not travel at all. The complexity of the choice shift process increases dramatically as we introduce the possibility of booking loss, which includes "defections" to competing carriers.

First, we must distinguish between consumers who choose to determine the availability of their initial or preferred alternative by dealing directly with an airline and those who deal with a travel agency. When dealing with a travel agency, the consumer still evaluates the next-best alternatives offered on the basis of minimizing increases in travel disutility, as described earlier. In this case, however, the next-best alternatives presented to the consumer are more likely to involve different airlines or even combinations of airlines. Furthermore, these next-best alternatives will generally involve lesser increases in disutility, both in terms of the fare product and flight itinerary components, than those presented by a single airline.

A next-best alternative can simply be a similar or identical fare product offered by a competing carrier on a very similar flight itinerary. The differences in travel disutility between alternatives can thus be very small, given a much larger set of alternatives from which the "next-best" one is selected. The greater number of next-best alternatives and the relatively small differences in

travel disutility among them make any generalizations about P(v) and P(h) far more difficult to make in the travel agency situation.

The same conditions lead to the conclusion that P(Q) is very difficult to measure. The probability of booking loss is affected by whether the request is being denied by the airline or by a travel agent. All else being equal, there must be some reduction in P(l) in the former case, since the airline reservations agent can encourage the consumer to accept a vertical or horizontal shift. This is one reason for the preference of most airlines that passengers book directly with them (the savings in travel agent commissions being another).

Like the probabilities of horizontal and vertical choice shifts, the probability of booking loss is determined by the specific attributes of the changed components of each pair of travel alternatives being considered. The travel alternatives involved are in turn affected by the source of information on availability (airline or travel agent), as described above. The probability of booking loss will also be a function of how many of the consumer's successive requests have been denied already, particularly when dealing directly with the carrier. Generally, each less desirable travel alternative offered by the same airline will represent a greater increase in travel disutility than would be the case when alternatives involving several carriers are involved. All else being equal, the consumer denied several requests by the same airline is likely to try another airline.

The mathematical formulations of the utilities relevant to consumer choice when a preferred travel alternative is unavailable can be extended and generalized to account for most, if not all, possible "next-best" alternative scenarios. The utility valuations and decision rules will be similar to those presented earlier for the simplified one-airline case, since the consumer will be making the same decisions, but with more information about travel options.

The market demand segment to which a consumer belongs for a particular trip can therefore be related to the consumer's expected choice shift behavior in the case of unavailability of one or more requested alternatives. Market segment criteria alone, however, may not be sufficient in predicting choice shift behavior, because the "choice set" with which the consumer is presented or of which he/she is aware will differ from one case to the next and have an impact on the ultimate choice shift made.

Passenger choice shift behavior can differ not only from one individual to another, but for the same individual planning different trips, and even for the same individual and trip at different points in the process of determining the availability of various travel alternatives. The probabilities of recapture and booking loss represent an average rate or expectation that must be estimated from an analysis of actual choice shifts. The difficulty lies not only in the survey methods required to sample intended behavior, but also in the need to identify similar consumers who are planning similar trips. Further theoretical consideration of the consumer choice process is required, along with much more extensive empirical studies of choice shifts.

The choice shift process described here can be summarized in a reservations decision tree framework. A request for a particular travel alternative can either be accepted or refused by the

airline, based on the availability of the requested fare product class and flight itinerary. If accepted, a booking is confirmed for the consumer. If denied, there is a probability that the consumer will be recaptured by accepting either a vertical or horizontal shift in travel alternatives. There is also a probability that the denied passenger will represent a booking lose to the airline.

To this point, our airline reservations framework has focused on denied requests stemming from unavailable travel alternatives. The assumption made implicitly is that each accepted request, or booking, will result in a ticket sale and, ultimately, a revenue passenger carried on a future flight. In reality, an accepted reservations request does represent a booking that decreases the seat inventory allocated to fare class and flight. Each booking, however, will translate into a filled seat that generates revenue for the airline only if the passenger actually purchases a ticket and shows up for the booked flight.

Our model of the airline reservations process should therefore incorporate the probabilities associated with each booking becoming a revenue passenger on a future flight. The probabilities of relevance are:

1. the probability that a booking will be cancelled prior to flight departure;

2. the probability that a booked passenger will fail to appear for a scheduled flight departure (i.e., be a "no-show").

Both of these probabilities will be affected by whether the passenger has purchased a ticket subsequent to having a booking confirmed for a future flight. A passenger that accepts a "next-best" alternative suggested by one airline may still call another airline to make another booking, and ultimately buy a ticket and travel on the competing carrier. As was the case with choice shift probabilities, these probabilities can also be affected by the demand segment of the passengers and the restrictions associated with the fare products booked.

The probabilities of cancellation prior to flight departure and of passengers not showing up at departure time are in essence both "cancellation" probabilities. Airlines distinguish the two rates because a cancelled booking prior to departure frees up a reservations "space" in the seat inventory that has the potential of being resold to another passenger. It is only possible to sell a seat suddenly left empty by a no show at departure time to "stand-by" passengers, if they are present.

The pre-departure cancellation rate has been treated in past research as having the Markovian property. That is, the probability of cancellation for any reservation on a particular day prior to departure is assumed to be independent of when that reservation was made initially. This assumption of "memoryless" cancellation rates was validated by Rothstein in 1968 [34], but fare product attributes and, in turn, reservations behavior have changed considerably since that time.

There exists a probability that a booking will be cancelled on any particular day prior to departure, and the "memoryless" assumption seems reasonable for this cancellation rate. That is, on day 17 prior to departure, there is no reason to expect that a particular booking made 35 days

out is more likely to be cancelled than one made 25 days out. There also exists a cumulative cancellation probability for any one booking that, under this assumption, increases with the number of days before departure that the booking was made. Thus, a booking made on day 35 before departure has a higher overall probability of being cancelled than one made on day 20, all else being equal.

The length of time before departure that a booking is made, however, is no longer the only determinant of that booking's cumulative cancellation probability. The imposition of advance purchase requirements and cancellation penalties after ticket purchase on certain low-priced fare products has introduced additional elements that can affect cancellation probabilities. Furthermore, many airlines now stipulate time limits before which either tickets must be purchased or the booking must be reconfirmed, even for "unrestricted" fare products. If the ticketing time limit, be it arbitrary or part of the fare product's restrictions, is not met, the airline's reservations computer will cancel the booking automatically.

In either case, ticket purchase leads to the same set of subsequent branches in the decision tree, and the same set of probabilities. A failure to purchase a ticket for the booking, however, leads to distinct results in the two cases. Given a ticketing time limit, the consumer who does not purchase a ticket will have the booking cancelled, whereas the consumer who fails to purchase a ticket in the absence of any time limit will ultimately be counted as a "no-show" should he/she decide not to make use of the reserved space. It is difficult even to speculate about the relative cumulative cancellation probabilities of bookings with and without ticketing time limits imposed, without additional information about the fare products being booked. As discussed earlier, the choice shift process and the consumer's knowledge of other travel alternatives can result in a booking that will not lead to a ticket purchase. Airlines seem to have recognized this, as they now impose ticketing time limits with greater regularity.

Automatic cancellation of bookings that were never intended to be used also enables the airline to derive better estimates of "true" no-shows.

Without a ticket having been purchased, no additional information is available to refute the assumption that cumulative cancellation probabilities are simply a function of length of time before departure that the booking is made. When a ticket is purchased, however, we can illustrate how cancellation probabilities can differ depending on the attributes of the fare product purchased. On one hand, the length of time in advance of flight departure that a ticket is purchased should still have a positive relationship with the cumulative cancellation probability, because travel plans made far in advance are more likely to change. On the other hand, the imposition of restrictions on the fare product of partial or total non-refundability should reduce the cancellation probability once the ticket has been purchased. It would seem reasonable, then, to expect that a booking for a fare product with a cancellation penalty is less likely to be cancelled than one for a fully refundable fare product. This is especially true for the price-sensitive passengers most likely to purchase heavily restricted fare products.

The inclusion of cancellation penalties and, more recently, non-refundability rules in the restrictions on low-priced fare products suggests that different cumulative cancellation

probabilities could well be exhibited by bookings for different fare products. The degree to which these probabilities will in fact differ depends on the advance purchase and cancellation restrictions imposed on different fare products. It will also depend on the consumer and trip characteristics of those making use of each type of fare product. With the recent introduction of non-refundable low priced fare products, the potential for observing significantly different cancellation probabilities across fare products has increased further.

The same reasoning applies to no-show rates across fare classes at departure time. No-show probabilities are bound to be higher for reservations made for fare products for which tickets are less likely to have been purchased and those with no cancellation penalties. A reservation for a very low-priced fare product, on the other hand, is more likely to have been made and tickets purchased well in advance. The price-sensitivity of the "typical" low-fare passenger, combined with a cancellation penalty on the low fare, should result in a lower no-show rate for the more restricted fare products.

These arguments suggest that, in seat inventory control, the probabilities of reservations cancellation and passenger no-show should be distinguished on the basis of the fare product booked, for total expected flight revenues to be maximized. The airline's ability to make such a distinction will depend on its success in differentiating fare products by imposing advance purchase requirements and cancellation restrictions, as well as on its success in separating pre-departure cancellations from "true" no-shows.

The airline reservations framework described in this section is based on the assumption that passengers requesting and booking seats for different fare products will behave differently both with respect to their responses to a denied request, and in terms of their cancellation and no-show actions. The relationships between market demand segments, fare products, and the reservations process itself should thus be considered in the development of a comprehensive approach to seat inventory control. The framework developed in this chapter describes passenger choice behavior in the context of current U.S. domestic air travel markets and its impact on the airline reservations process. The probabilistic components of this reservations process highlight the uncertainty faced by airlines in accepting or denying reservations requests.

SEAT INVENTORY MANAGEMENT

An airline’s inventory contains all flights with their available seats. The inventory of an airline is generally divided into service classes (e.g. first, business or economy class) and up to 26 booking classes, for which different prices and booking conditions apply. Inventory data is imported and maintained through a schedule distribution system over standardized interfaces. One of the core functions of the inventory management is the inventory control. Inventory control steers how many seats are available in the different booking classes, by opening and closing individual booking classes for sale. In combination with the fares and booking conditions stored in the Fare Quote System the price for each sold seat is determined. In most cases inventory control has a real time interface to an airline’s Yield management system to support a permanent optimization of the offered booking classes in response to changes in demand or pricing strategies of a competitor.

Availability Display and Reservation (PNR)

Users access an airline's inventory through an availability display. It contains all offered flights for a particular city-pair with their available seats in the different booking classes. This display contains flights which are operated by the airline itself as well as code share flights which are operated in co-operation with another airline. If the city pair is not one on which the airline offers service it may display a connection using its own flights or display the flights of other airlines. The availability of seats of other airlines is updated through standard industry interfaces. Depending on the type of co-operation it supports access to the last seat (last seat availability) in real-time. reservations for individual passengers or groups are stored in a so-called passenger name record(PNR). Among other data, the PNR contains personal information such as name, contact information or special services requests (SSRs) e.g. for a vegetarian meal, as well as the flights (segments) and issued tickets. Some reservation systems also allow to store customer data in profiles to avoid data re-entry each time a new reservation is made for a known passenger. In addition most systems have interfaces to CRM systems or customer loyalty applications (aka frequent traveler systems). Before a flight departs the so-called passenger name list (PNL) is handed over to the departure control system that is used to check-in passengers and baggage. Reservation data such as the number of booked passengers and special service requests is also transferred to flight operations systems, crew management and catering systems. Once a flight has departed the reservation system is updated with a list of the checked-in passengers (e.g. passengers who had a reservation but did not check in (no shows) and passengers who checked in, but didn't have a reservation (go shows)). Finally data needed for revenue accounting and reporting is handed over to administrative systems.

Fare Quote and Ticketing

The Fares data store contains fare tariffs, rule sets, routing maps, class of service tables, and some tax information that construct the price – "the fare". Rules like booking conditions (e.g. minimum stay, advance purchase, etc.) are tailored differently between different city pairs or zones, and assigned a class of service corresponding to its appropriate inventory bucket. Inventory control can also be manipulated manually through the availability feeds, dynamically controlling how many seats are offered for a particular price by opening and closing particular classes.

The compiled set of fare conditions is called a fare basis code. There are two systems set up for the interchange of fares data – ATPCO and SITA, plus some system to system direct connects. This system distributes the fare tariffs and rule sets to all GDSs and other subscribers. Every airline employs staff who code air fare rules in accordance with yield management intent. There are also revenue managers who watch fares as they are filed into the public tariffs and make competitive recommendations. Inventory control is typically manipulated from here, using availability feeds to open and close classes of service.

The role of the ticketing complex is to issue and store electronic ticket records and the very small number of paper tickets that are still issued. Miscellaneous charges order (MCO) is still a paper document; IATA has working groups defining the replacement document the electronic multipurpose document (EMD) as at 2010. The electronic ticket information is stored in a

database containing the data that historically was printed on a paper ticket including items such as the ticket number, the fare and tax components of the ticket price or exchange rate information. In the past airlines issued paper tickets; since 2008 IATA has been supporting a resolution to move to 100% electronic ticketing. So far, the industry has not been able to comply due to various technological and international limitations. The industry is at 98% electronic ticket issuance today although electronic processing for MCOs was not available in time for the IATA mandate.

Fare Basis Code

A **fare basis code** (often just referred to as a **fare basis**) is an alpha or alpha-numeric code used by airlines to identify a fare type and allow airline staff and travel agents to find the rules applicable to that fare. Fare codes starts with a single letter, called a booking code or class, which matches the letter code that the reservation is booked in.[1] Other letters or numbers may follow. Typically a fare basic will be 3 to 7 characters long

Airline Specific Codes

There is an endless list of other codes on modern fares. These are not standardized in any way, and may often be for short-term use. Examples are...

- Codes that indicate an airlines common name for a fare. As a hypothetical example, an airline selling what they refer to as their "Super-Saver" fare may use SPRSVR in the fare basis, or may use it as the entire code.
- Codes that limit a fare to a particular company. An airline may negotiate a fare with the XYZ company and include these letters in their fare basis. Negotiated ares are normally only visible to agents that have a contract to sell them, and are not publicly listed.

Multi-fare Business

It is common for an air ticket to have more than one fare basis, particularly if it is for carriage on more than one airline. The issuing airline may often have an interline agreement to allow other airlines on the ticket. One disadvantage of this system is that if any change is made, the most restrictive fare rule may apply to the entire ticket, not just the portion being changed.

Global Distribution System

In a GDS, the fare basis will typically display as part of a fare display, and will not normally be shown in an availability display. Some modern booking systems allow availability searches using parameters such as time of day and lowest fare, and may negate the need for an agent to firstly study the fare basis rules.

Tickets

The fare basis is normally shown on the air ticket. On older paper tickets, it was highlighted on the relevant coupon for that flight. On modern e-tickets, it is often printed under the flight details.

GDS Booking Policy

In an effort to reduce distribution costs Jet Airways (9W) would like to lay down guidelines and set clear expectations for reserving, booking and ticketing itineraries through the use of a Global Distribution System (GDS) or Central Reservations System (CRS). This policy is in line with industry partners and is intended to defer increasing distribution costs caused by improper CRS/GDS booking practices. This will also result in last seat availability on GDS and ultimately allow the GDS subscribers to offer greater numbers of seats for firm passengers.

a. Definition

Booking and ticketing practices that result in unnecessary distribution costs and inventory spoilage are termed as GDS mis-use or violations.

These processes result in excess GDS fees and account for a significant percentage of an airline's overall distribution costs.

b. Purpose

This policy aims to reduce the costs associated with inactive segments and other booking related practices which cause negative inventory consequences. It is important that all subscribers using a GDS adhere to these policies to prevent revenue leakages to the airline inventory and avoid violations of reservations, fare and ticketing guidelines. Enforcing these policies would also assure last seat availability on GDS and ultimately allow the GDS subscribers to offer greater numbers of seats for firm passengers.

c. Implementation

Jet Airways implement this policy with immediate effect.

d. Application

This policy applies to all travel service providers including travel agents, online travel agents and any person or entity accessing 9W inventory via internet or any other electronic means. The travel agent must ensure that all its employees in all of its locations are made aware of this policy and of its future amendments. The terms and conditions of this policy and its associated practices and procedures are subject to change upon notice by 9W.

e. Auditing of Bookings

Jet Airways reserve the right to audit all booking transactions to identify non-compliant booking practices.

Duplicate Bookings

- Travel service provider must not create duplicate bookings in the same passenger name record (PNR) or across PNRs for the same passenger
- Duplicates include booking the same passenger confirmed/re confirmed on same or different flight, class, date or route where it is not possible for the passenger to travel simultaneously
- Travel service provider must not create impossible traveling itineraries by holding concurrent flights on the same time period where it is not possible for the passenger to travel simultaneously

Fictitious Booking

Travel Service providers must not create any fictitious bookings, testing or training bookings that block the airline's inventory in the live GDS environment. Training environment is provided by all GDS and agents must use this mode for testing situations or training personnel. Creating PNRs for training purposes using active environment is prohibited. Fictitious names include bookings with spurious or fake names, names of famous personalities with no intent to travel, bookings made for testing purposes, bookings made with intention of blocking inventory

Inactive Segments

Travel service provider must take timely follow-up action on reservations that have been cancelled by the airline by releasing inactive segments from the bookings

Travels service providers must ensure that all inactive segments such as "HX", "NO", "UC", "UN" etc are removed from the active PNR to its history at least 24 hours prior to departure and within the same calendar month that the segment has been cancelled by 9W

Churning Of Bookings

- Travel service providers must avoid repeated cancelling and re-booking of the same or different flight, class, date or route (known as churning) to circumvent ticketing time limits or for any other reason whatsoever; as this leads to unreasonably high booking / cancelling volumes resulting in higher GDS fees for the airline
- Churning also includes repeated re-booking of segments cancelled by 9W, repeated booking and cancelling segments within the same PNR or across PNRs and within the same GDS or across GDS

Waitlist

- Travel service providers must not repeatedly create waitlisted bookings, since these do not increase chances of confirming and result only in higher booking volumes and increased GDS fees for airline
- Travels service providers must ensure all Waitlisted bookings are removed from the active PNR at least 24 hours prior to departure

Passives

- Passive bookings must be created for ticketing purposes only and must match with booking existing on the 9W reservation system
- Passives are permitted for ticketing against bookings held on the airline system only
- Passives are not permitted against live booking on the same GDS system
- Passive are not permitted against live bookings across different GDS by same travel service providers
- Passive segments must not be used for reasons, such as satisfying GDS productivity requirements or to circumvent fare rules

Invalid Ticketing

- Travel service providers must not retain bookings with invalid ticket numbers
- Invalid ticket numbers include restricted, used, refunded voided or non-existent ticket numbers

- Travel service providers must not issue confirmed tickets against bookings that are on request or non-confirmed status in 9W internal reservation system
- Travel service provider must ensure that the class code used for issuing ticket is identical to the code that exists on the PNR
- For interline itineraries, travel service provider must validate 9W bookings with ticket numbers of only those airlines that have a ticketing and baggage agreement with 9W

g. Best Booking Practices

- Travel service providers must never create any active or passive booking or transaction for achieving productivity or incentive targets set by GDS
- Travel service providers must take appropriate and timely follow-up action for any un-ticketed booking to ensure that there is no spoilage of airline inventory
- Travel service providers that use more than one GDS must book and ticket a specific passenger itinerary within the same GDS
- Travel service providers must not create PNRs to hold or block reservations due to expected demand, customer indecision, or to circumvent any of 9W fare rules or policies
- Travel service providers must not change name once PNR is created
- Travel service providers must not create bookings that violate minimum connecting time requirements of individual airlines
- Travel service provider must provide customer's first and last names which are identical to the customer's passport
- Travel service provider must comply with applicable government regulations and provide customer security information on PNR as required
- Travel service provider must provide passenger's mobile contact number on the correct GDS phone field or through OSI element to the airline to facilitate flight disruption handling of customer due to delays, re-schedules etc
- In case of changes to itineraries in a passenger name record (PNR), it is necessary to re-request any special service requests from the original booking
- This includes unaccompanied minors and special meal requests. When an SSR message is needed for only part of the itinerary, the special service request must be flight specific and not requested for all flights
- Travel service providers must action queues promptly and ensure that the passenger is notified of any changes to his or her booking as soon as possible

h. Ticketing Policy

- Travel service provider must always use latest and updated fares rather than pre-stored fares to issue tickets
- Travel service provider must adhere to ticketing time limit and ensure that booking is either ticketed or cancelled before expiry of ticketing time limit
- Travel service provider must report genuine ticket numbers that is valid for travel on associated PNRs

- Travel service provider must collect and report accurately all taxes, fees and surcharges imposed by local and foreign government. Travel service provider must ensure collection of penalties for no show, cancellation, re-issue etc as applicable

SEAT INVENTORY CONTROL PROBLEMS: INTERNATIONAL BEST PRACTICES

As discussed in the preceding two chapters, differentiated fare products are targeted at distinct market segments of the total demand for air travel. Individuals in each of these segments will emerge from the air travel choice process with preferences for different types of fare products. To make the most effective use of the differential pricing strategies that they have adopted, most airlines practice seat inventory control to limit the number of seats that may be sold as each of the fare products offered. In airline reservations systems, limits are placed on the number of seats available in each fare class or booking class, which can contain several fare products. Controlling the mix of fare products to be sold for a particular flight has come to be regarded by some airline managers as by far the most important aspect of marketing, more important than the actual prices charged for each fare product. This chapter provides an overview of the seat inventory control problem from the airline's perspective. The problem is described in the context of current airline operations, given existing route systems, fare structures and reservations systems.

The types of data available to most airlines for dealing with this problem are outlined and alternative approaches to limiting the seats available to various fare classes are discussed. The second section of this chapter then summarizes the state of current practice in seat inventory control in the airline industry, and identifies the constraints and limitations that airlines are working to overcome.

Scope and Extent of the Problem

The differential pricing strategies adopted by airlines in recent years in an attempt to increase total revenues also represent a response by major carriers to intensified price competition from low-cost new entrants or older airlines revived by pricing aggressiveness. By offering a limited number of seats at the lowest fares advertised by price leaders, established airlines can at least appear to be competitive in price and might even be able to fill otherwise empty seats with stimulated demand.

The availability of different fare products generating different revenue levels has led many airlines to become interested in "yield management". Yield management, taken literally, involves the application of strategies that affect the airline's overall yield, usually with the objective of increasing it.

While yield is an important airline revenue measure, it should not be used as the only indicator of an airline's ability to generate revenues and, in turn, its profitability. High yields and low load factors could be far less profitable for an airline than lower yields and higher load factors. Yields and traffic levels tend to be inversely related, such that the attainment of both high yields and high load factors can be an elusive goal for airlines, particularly in competitive markets.

The yield or average revenue per passenger-mile collected by an airline that offers a multiple-tier fare structure will depend on both the price levels associated with, and the number of seats made available to, each fare class. Yields can be increased either by increasing price levels or by reducing the proportion of seats sold in the lowest fare product categories. Neither action, however, will guarantee an increase in total operating revenues for the airline. An increase in yield caused by reducing the availability of low-fare seats must be weighed against a potential loss of traffic.

For the profit-maximizing airline, an objective of maximizing total revenues is more appropriate than one of maximizing overall passenger yield. Given a commitment to operate a scheduled flight with a fixed operating cost, and acknowledging the very low marginal costs of carrying additional passengers on that flight, an airline that maximizes total flight revenues will in fact maximize operating profits.

"Revenue management" is thus a more appropriate term than yield management, because maximizing yield does not necessarily maximize profit. Revenue management involves both pricing and seat inventory control. Under ideal conditions, airlines would have sufficient market information to maximize total revenues by finding an optimal combination of prices and seats associated with each of the fare products to be offered on a future flight. In practice, airlines must take into account the pricing actions of their direct competitors, particularly those actions that affect the price-sensitive market segments. In the past, airlines have matched competitors' fares in a very predictable manner, especially the lowest fares. More recently, some airlines have recognized that some differences in service levels (e.g., non-stop versus connecting flights) offered in a market can allow them to maintain a price differential, even for the lowest-priced fare products. Nonetheless, matching of price levels for all fare products is virtually universal among direct competitors.

The competitive nature of airline pricing means that, as a strategy in revenue management, changes to price levels and/or fare product attributes can seldom be implemented successfully by any one airline. American Airlines attempted to introduce a more "rational" fare structure to its domestic markets several times in the recent past. Each introduction was followed by reactions and revisions on the part of American's competitors, with the result that the ultimate changes were not nearly as "rational" as those originally proposed by American. Not all airlines can have even this muted impact on fare product offerings, because most airlines do not have the national market presence of American. The introduction of revised fare product attributes, even by a large airline, can be subverted by the independent pricing actions of a smaller competitor in one or more markets, causing a wider reaction amongst its competitors in other markets, which can in turn spread throughout national markets.

While pricing is clearly an important component of revenue management, no one airline can predict the impact of new prices on its own revenues without taking the reactions of its competitors into account. Seat inventory control, on the other hand, is a tactical component of revenue management that is entirely under the control of each individual airline and is hidden from consumers and competitors alike. The seat inventory control actions of competitors, to the

extent that they can be determined, must still be taken into account, as making too few seats available to low-priced fare products might result in a loss of traffic to a competitor with more low-fare seats available. (It is possible for airlines to determine when a competitor's fare class is "sold out" for a particular flight from availability messages sent between reservations systems). Nevertheless, seat inventory control has the potential of increasing the total revenues expected from flights on a departure-by-departure basis, something that would be far more difficult through pricing actions.

The remainder of this dissertation examines the seat inventory control component of the airline revenue management problem. For the reasons cited above, the price levels associated with each of the fare products, and thus the fare classes in the reservations system, are assumed to be given and constant over the period during which most of the reservations are accepted for a future flight departure. The seat inventory control problem, then, is to determine the optimal (revenue-maximizing)limits on the sale of available seats in the various fare classes being offered on a future flight departure.

The seat inventory control problem for a particular flight is defined to a great extent by the equipment utilization decisions made in the airline scheduling process.

From the outset, the decision to operate a particular type of aircraft on a flight routing can have implications for seat inventory control, given that anticipated demand and aircraft size are unlikely to match exactly. Routing constraints and passenger flow imbalances can mean that the most appropriate size of aircraft cannot always be physically assigned to a flight departure. A significant excess or shortage of seats relative to total demand for a particular flight departure will reduce or increase the need, respectively, for strict control of low-fare sales. Seat inventory control in essence provides an opportunity to adjust for imperfections in the longer-range schedule design process. Ironically, seat inventory control can at the same time hide true demand data from those responsible for long-range schedule planning, as increased availability of low-fare seats can increase total traffic and overall load factors.

Seat inventory control can be approached with respect to individual flight legs, the airline's entire route network, or some sub-unit of the schedule such as a particular connecting complex at a given time at an airline's hub airport. The flight leg approach is by far the simplest and is currently used by most airlines, as discussed in the following section. Demand on the flight leg for each fare class is estimated and seats are allocated among the classes for each future flight leg separately. The demand for a fare class is considered to be the total number of passengers that will request a seat on a particular flight leg and fare class as part of their origin destination itinerary.

The leg-based approach to seat inventory control is directed toward maximizing flight leg revenues, not necessarily total system revenues for the airline. For a two-leg flight, (e.g., Boston - New York - Miami) a leg-based approach to seat allocation might limit the number of seats sold on the first leg to the lowest fare class, say class Q. This inventory of Q-class seats would be shared, for example, by the Boston-New York local Q-class passengers paying $29 and the Boston-Miami through Q-class passengers paying $99. If demand for the local fare is high, the

airline could be losing the revenue from potential through passengers to Miami. To maximize system revenues, it is necessary to distinguish between these two requests for Q-class seats on the first leg.

An origin-destination or market-based approach to seat allocation is required to overcome such revenue-loss problems. Seats would be allocated to the fare class/passenger itinerary combinations available on each flight leg, with seats being protected for those combinations generating the greatest revenues. Complex network formulations of all fare class/passenger itinerary combinations and their expected revenues would be required to find the system-wide optimal seat allocations.

In more practical terms, airline computer reservations systems would have to be re-programmed to manage seat inventories on the basis of passenger O-D itineraries rather than by simple flight leg and fare class availability. Nevertheless, several major carriers have plans to pursue this approach to inventory control, with American Airlines being among the leaders in this development.

The complexity of the problem, even at the single-leg level of analysis, has increased tremendously with the development of hub-and-spoke route networks by most large airlines. A large air carrier can operate over 1000 flights per day, serve several thousand O-D markets and offer five fare classes in each market. American Airlines, for example, now serves over 2700 origin-destination markets, compared with about 800 before deregulation [36]. For any one particular flight departure to its Dallas/Ft. Worth hub, passengers typically can be booked into one of at least five fare classes to one of more than fifty destinations. There can thus be over 250 possible fare class/destination combinations for each seat on such a flight leg, each of which will generate different revenue levels for the airline. With reservations for future flights being accepted up to 11 months in advance, the size of the seat inventory control problem can become unmanageable.

Clearly, no airline is in a position to make separate seat inventory control decisions about each of the tens of thousands of fare product/itinerary possibilities it offers each day. Much of the battle in the development of an effective seat inventory management process involves balancing the aggregation of O-D markets and/or fare classes offered on a flight, necessary to keep the size of the problem manageable, against the disaggregation necessary to enable the airline to control the availability of seats in different fare classes in specific markets.

At the level of the individual flight leg, seat inventory decisions must be made within the constraints imposed by the airline's network, schedule and reservations system capabilities. The aircraft assigned to a particular flight departure is known and, in turn, the number of seats available in each compartment (first, business, coach) can be regarded as fixed. Seat inventory decisions must also take into account the overbooking levels to be used for each flight departure, as determined from an analysis of the costs associated with over sales and subsequent denied boarding of confirmed passengers, as well as the costs in lost revenue associated with "no-shows" and unused seats. Because the problem involves the management of available reservations "spaces" as opposed to physical seats on the aircraft, the interaction between the fare

class mix of passengers booked and the number that ultimately show up for a flight can have significant revenue implications.

Managing the inventory of available reservations spaces on a future flight leg is therefore a process which occurs in the context of a pre-determined departure time and aircraft type, and which is generally subordinate to other capacity decisions involving the distribution of on-board space among physical compartments and, in current practice at least, the targeted limits for overbooking the flight. Furthermore, in most instances, the fare products (and thus the fare classes) as well as their respective prices can be assumed to be given and constant throughout the booking period for the flight.

Finding the optimal limits on the number of bookings that may be accepted in a particular fare class on a future flight leg requires estimates to be made of both the expected demand for each fare class and the average revenue associated with each class. Whether these estimates are based entirely on historical patterns or derived from a forecasting model, data from past flights are required. For a forecast of leg demand, information on booking levels prior to departure and actual boarding fare class, by flight leg, and by day of week must be extracted from the reservations system and stored for seat inventory control decision support purposes. Most airlines have implemented database management systems that perform this function.

Estimating the revenue associated with bookings in each fare class can be more difficult, since revenue data are usually collected and summarized independently of the reservations system. Thus, the sophistication of an airline's seat inventory control system depends not only on the particular approach used to determine optimal fare class limits, but on the quality of the data retrieval, forecasting and estimation methods that provide the input data required for such calculations.

The actual process of seat inventory control for a future flight departure can be as simple as a one-time setting of booking limits on discount fare classes at the start of the reservations process for that flight, and taking no further action as reservations are accepted. A more sophisticated approach would take into account the information provided by actual reservations as they are accepted, through monitoring of booking data, and then adjust fare class booking limits as flight departure approaches. A comprehensive effort to manage seat inventories and improve yield would be a dynamic one in which traffic and booking histories are used to set initial fare class booking limits, actual bookings in each fare class are monitored relative to these limits, and frequent adjustments are made on the basis of an analysis of past data, current bookings, and forecasts of future bookings for the flight.

Setting, monitoring and adjusting fare class booking limits is a process which requires both technical capabilities and human expertise. Management information systems are required to retrieve, summarize and analyze historical reservations and traffic data. The judgement of seat inventory control analysts assigned by the airline is also necessary to determine the extent to which historical data can be applied validly to current conditions in each market. Clearly, rapid changes to competitive conditions in the industry or in particular markets, or unusual operational events in a market, reduce the value of historical data. Still, there is a wealth of information

available to carriers in their reservations systems which can be used to assist in seat inventory control by reducing the manual effort required by analysts while improving their decision making process.

The process employed by an airline to manage its seat inventories will be affected by the range of tools and resources that it has available for this purpose, which will in turn be determined by the importance that corporate decision-makers attribute to improving revenue management. From the outset, the seat inventory control system employed will also depend on the characteristics of the airline's network and on its fare structure. An airline offering a single fare level for all seats on flights serving point-to-point markets on a non-stop basis clearly need not be concerned about sophisticated seat inventory control techniques. At the other extreme, a carrier with multiple fare classes on flights into and out of large connecting hub complexes can benefit immensely from improved seat inventory control.

Most established (i.e., pre-deregulation) airlines are closer to the latter extreme, and as such are extremely interested in revenue management. Among such airlines, there is a range of effort devoted to, and a range of sophistication in, seat inventory control. As described in the following section, current practice in this area is evolving quickly, yet a strong emphasis on human expertise in making seat inventory control decisions remains.

Seat Inventory Control Practices

Organization Issues

Seat inventory control and revenue management are closely related to a range of other functions found in current airline corporate structures, such as pricing, marketing, reservations, overbooking and payload control. None of the airlines surveyed have been able to combine all the functions critical to revenue management into a single unit, although several major carriers have moved in this direction. Pricing and overbooking control were the most frequently named functions to have been incorporated into the revenue management unit, which in turn was most commonly found in the airline's marketing or market planning department. Coordination with the remaining related functions that for various reasons could not be included in the same department, poses a problem for most of the airlines surveyed.

There seems to be a consensus among those involved in the process that the preferred place for a seat inventory/revenue management group is in the airline's marketing department. The close relationship of seat inventory control to the reservations, pricing and fare product development functions make the marketing department a logical place for the revenue management function. At many of the airlines surveyed, however, those responsible for setting and monitoring flight overbooking levels remain in separate departments responsible for reservations and sales in some cases and payload control/operations in others. There can thus be substantial resistance and turf-based conflicts with respect to the transfer of the overbooking function to an ever-expanding marketing department.

The personnel responsible for monitoring and adjusting booking limits throughout the reservations process - seat control analysts - make up the largest group in most revenue management units. There were substantial differences among the carriers surveyed in the use of seat control analysts, both with respect to the number of analysts employed and the degree to which the analysts are responsible for specific markets.

Although the number of analysts employed does not necessarily reflect the sophistication of an airline's seat inventory control process, it does reflect the resources devoted to the problem. The number of agents "required" to manage a carrier's seat inventory would seem to be related to the number of flight legs operated each day and to the proportion of a carrier's flight legs that operate in highly competitive markets or during peak periods of demand.

For those carriers with relatively few analysts working on seat inventory control, booking limit monitoring and adjustment is almost entirely an ad-hoc process, perhaps targeted at selected markets and flight legs. The carriers with proportionately more analysts generally have a more systematic process in which teams of analysts are responsible for groups of markets and/or flight legs. The carrier with the highest number of analysts relative to its daily departures has taken the notion of specialization to the extreme, making each seat control analyst responsible for all flight legs that serve a particular market or set of routes. Each agent must consider historical data, competitors' actions and current trends to both set initial fare class booking limits and make adjustments as reservations are accepted. These agents are then held accountable for the traffic mixes and revenue levels achieved on their own routes.

Overall, the airlines surveyed face very similar problems in organizing their revenue management groups. While some carriers have progressed more rapidly than others in unifying seat inventory control and related activities, coordination of functions, resistance to organizational change and even intra-departmental organization are still issues that all face as their revenue management functions evolve.

Reservation and Decision Support Systems The effectiveness of an airline's seat inventory control process depends on the capabilities of its reservations system and on its ability to extract useful historical reservations and traffic data to assist in making booking limit decisions. As was the case with organizational structures, many carriers are currently taking steps to make their reservations systems more responsive to seat inventory control needs and to develop more sophisticated data retrieval and analysis methods.

Most of the airline reservations systems in place today are deficient in several areas of relevance to seat inventory control. For example, the number of fare class "buckets" into which bookings can be logged is a major limitation for most of the carriers surveyed. At least one bucket is required for each of the physical compartments on an aircraft. Any remaining buckets are used by most carriers as sub-classes of a shared coach compartment. Currently, most systems limit fare class bookings by flight leg and some have the capability of limiting sales to local passengers in favor of through and connecting passengers that generate more total revenue. The large number of fare product/O-D market combinations possible on a single flight leg makes it

desirable for the airline to be able to take reservations in a large number of fare classes and to limit sales in specific markets when necessary.

Airline attempts to make use of more fare class buckets to control their seat inventories by passenger O-D itinerary have been impeded by the existing standardized interline distribution system. The major reservations systems used by travel agents currently display seat availability and accept bookings in a maximum of five classes. Given the need to exchange availability and booking information with other reservations systems, airlines are constrained in improving their own systems by the need to maintain this standardization.

Several carriers are nonetheless changing their own reservations systems to accept bookings in a much larger number of reservations buckets. In one example of what will be the "new generation" of reservations systems, eight primary fare classes will have up to five subordinate buckets for use in controlling low-fare bookings in particular origin-destination markets. The expanded reservations systems will allow an airline to limit, for example, the number of extremely low-priced seats in selected markets without closing down the entire fare class on a flight leg to additional bookings.

Existing reservations systems do not permit the airline to differentiate between passengers requesting similar fare products for very different itineraries on the same flight leg, as these passengers are booked in the same fare class. The development of such origin-destination based reservations systems is a top priority in the area of revenue management for several of the airlines surveyed.

American Airlines has acknowledged that it in fact has such a system already in place, and that the focus of its seat inventory control process has changed to one of "selling the system". The goal is to manage fare class inventories with respect to the revenues generated by the passengers on local, through, and connecting itineraries, all on the same flight leg. The decision models required to achieve this goal are far more complex than those required for simple leg-based seat inventory control, and are still in the developmental stages. Although a few airlines are well-advanced in the redesign of their reservations systems for more effective seat inventory control, many others are still several years away from implementing such changes. And, even if most airlines succeed in expanding their reservations systems, it is likely that flight availability will continue to be displayed, and bookings made, in one of the five primary fare classes. The additional sub-classes are intended to be "hidden" from travel agents and airline reservations staff, and are to be used only by airline seat control analysts. The industry standard of five booking classes for any one flight leg is therefore likely to remain intact for some time, until a "new generation" of reservations systems has been implemented widely. The implication of the five fare class limit imposed by the interline standards is that all airlines hoping to upgrade their own systems are constrained by the need to remain compatible. Carriers that operate flights with both First Class and Business Class compartments are particularly constrained by this compatibility problem.

With distinct reservations classes required for each of the physical compartments on the aircraft (including the coach cabin), only two fare classes remain for control of reduced fare sales. In

markets where there exist, for example, 30-day advance purchase fares, 14-day advance purchase fares, and unrestricted "super-coach" discounted one-way fares, the availability of only two discount fare categories can force the airline to aggregate rather dissimilar fare products and to give up some of its control over reduced fare sales. In addition to the number of fare classes, primary and subordinate, in an airline's reservations system, the structure of these fare classes is perhaps equally important to the needs of effective seat inventory control. The structure of fare classes in the system involves the relationship between the classes, specifically their interdependence in terms of applying booking limits. For seat inventory control purposes, it is desirable to have a nested hierarchy of fare classes, nested in ascending order of revenue value to the airline. Over half of the carriers surveyed currently have a totally or partially nested fare class hierarchy in their reservations systems. Other carriers have their coach cabin fare classes independently nested in a cumulative Y fare class, with little or no interdependence among the reduced fare classes within the coach cabin. The airlines planning to upgrade and expand their reservations systems agree that a nested fare class hierarchy would be preferable from the seat inventory control perspective. In the expanded systems, each sub-class could be nested within the respective primary class, which would in turn be nested within the cumulative coach cabin reservations bucket.

The capabilities of existing reservations systems place a technical constraint on the improvement of seat inventory control techniques. Ironically, individual airlines' efforts to improve their own reservations systems must take into account the direction adopted by other airlines, particularly those with the dominant systems. An airline's reservations system also plays an important role in providing the data required as decision support for seat inventory control. Decisions must be made with respect to initial fare class booking limits, which may require revision on the basis of actual reservations received and forecast demand. Both the initial limits and demand forecasts must be derived at least in part from historical booking patterns and traffic data for the same or similar flights. The capability to retrieve and summarize relevant historical data is thus crucial to seat inventory control.

The decision support function of the airline reservations system is distinct from its capabilities in terms of the number of fare classes and their relationships. Consequently, the data management and analysis functions required for decision support in seat inventory control can be developed and even used independently of the reservations system itself, although linkages for recovering raw data from the system must be maintained. Of the carriers surveyed, those with computer systems large enough to handle the extra load are developing their decision support tools for use in conjunction with their reservations systems. On the other hand, several carriers expressed concern that the decision support functions would tax their already overburdened reservations systems and significantly increase delays for both reservations agents and customers. These carriers are contemplating the purchase of separate software and hardware for seat inventory control decision support purposes.

Setting and Monitoring Booking Limits

The organizational structure of an airline's revenue management unit, together with the information tools available to it, provide a foundation for the tasks offsetting, monitoring and adjusting fare class booking limits so as to maximize flight revenues. It is in this component of the seat inventory control process that differences among airlines in terms of sophistication are most apparent. These differences stem in part from the organizational and information issues discussed above, but also reflect varying amounts of emphasis placed by each airline on setting initial fare class limits, monitoring actual reservations relative to these limits, and then making necessary adjustments.

At the simplest level, setting the initial booking limits for reduced fare classes can be done on an "across-the-board" or default value basis. The use of default values for all flights operated in certain types of markets or with particular aircraft types requires little in the way of resources, but does not take into account important differences in passenger mixes and booking patterns between markets or even between flights in the same market. Greater precision can be achieved by setting lower fare class limits by market, day-of-week, even time-of-day of future flight departures, but this requires substantial analytical effort. If the airline's seat inventory control process consists solely of setting fare class limits at the start of the booking process, then a more detailed approach is certainly preferable. All the carriers surveyed have progressed beyond this simplest level of seat inventory control, although several have done so only in the recent past. Most airlines have recognized that greater benefits from their seat inventory control efforts can be realized by developing a reservations monitoring and booking limit adjustment process than by intensifying their efforts to improve the accuracy of the initial limits.

That is not to say that the initial limits placed on different fare classes are not important. Any differentiation among markets or flights can help to reduce the amount of intervention required later in the process and is better than no differentiation at all. One of the larger carriers surveyed uses some default values for groups of flights and then identifies specific markets, flights, and/or periods of operation that might require more careful attention. Another carrier that assigns responsibility for different routes to individual agents leaves the setting of initial limits to them. The default limits automatically entered into the reservations system for this same carrier are the actual passengers boarded by fare class for the same flight, one year earlier. Most of the remaining carriers use aggregate approaches in which limits are initially set according to aircraft type and/or broad market groupings. A relatively simple approach to setting initial booking limits can be counterbalanced by a more sophisticated system of monitoring cumulative bookings by fare class, relative to these limits. The monitoring function can easily be automated through the airline's reservations system. Even the simplest of systems can be programmed to generate reports listing the future flights for which the number of accepted reservations approaches the fare class booking limits. All of the carriers surveyed have routines in place that can perform this function, although not all of them have a seat inventory control process in place that makes full use of the monitoring reports.

More sophisticated computer routines can be designed to flag flights for which actual reservations levels meet or approach one of several different types of booking limit values. For example, a flight might be flagged by the monitoring system if the number of bookings accepted in a lower fare class approaches the class limit, if total low-fare bookings exceed some percentage of total seats, and/or if the total number of unbooked seats drops below some pre-set value. The most advanced of the automated monitoring systems found among the airlines surveyed makes use of all three monitoring methods. That is, flights are flagged when any one reduced fare class reaches it own booking limit, when the nested low fare classes reach a cumulative limit, or when the total number of unbooked seats remaining in the coach cabin falls below some targeted level. The airline reservations systems surveyed all monitor actual bookings relative to pre-set and static fare class limits, with varying degrees of sophistication. The least advanced aspect of revenue management and seat inventory control at all of the airlines surveyed is that of booking limit adjustment to maximize flight revenues. This task involves modifying, when necessary, the initial booking limits on each fare class to take into account both actual bookings received and additional bookings expected over the time remaining to flight departure. This is the most important component of seat inventory control, yet it remains dependent on ad-hoc human judgment rather than systematic analysis. Resource limitations and a lack of practical models for making optimal decisions about changes to fare class booking limits as the flight departure approaches have kept the adjustment task at a low level of sophistication.

When an airline's reservations monitoring system flags a flight for which actual bookings approach any one of the limits or the threshold established for that flight, a decision must be made either to increase the availability of seats in the relevant fare class or to allow the system to close it down to additional reservations. This decision is currently being made by seat control analysts on the basis of experience and judgment at every airline surveyed, although the development of decision support tools is designed to reduce the amount of guesswork involved. Differences among airlines in adjusting booking limits stem to a greater extent from the number and responsibilities of the seat control analysts than from differences in the actual techniques used to make adjustment decisions.

AIRCRAFT FINANCING

ROLE OF CAPE TOWN CONVENTION & AIRCRAFT EQUIPMENT PROTOCOL: BACKGROUND

One of the critical concern of the airline operators have often been the right means to procure the finance for leasing/purchasing of aircraft (Mobile Equipment). After a great deal of persuasive effort, a Diplomatic Conference took place at Cape Town, South Africa, from 29 Oct to 16 Nov 2001, and on 16 November 2001, no fewer than 25 States, signed the 'Convention on international Interests in Mobile Equipment(the Convention) and the Protocol on Matters specific to Aircraft Equipment (the Aircraft Equipment Protocol). Initially, the proposal was to include the name of UNIDROIT in the title, as had been done with the 1988 Convention on International Factoring and International Financial Leasing. Secretary General of UNIDROIT, Prof. Herbert Kronke, who was present at the Conference, however, expressed the wish that in

tribute to the Conference host, the Government of South Africa, the Convention should be known as 'Cape Town Convention', and it was deservingly accepted.

The Convention and Protocol is the product of close collaboration between the two sponsoring Organizations, the International Institute for the Unification of Private Law (UNIDROIT) which had initiated the project many years before, and the ICAO. Also, closely involved in the work were, for aircraft objects, the IATA and the Aviation Working Group (AWG); for railway rolling stock, the Intergovernmental organization for International Carriage by Rail (OTIF) and the Rail Working Group; and for space assets, the UN Commission on the Peaceful Uses of Outer Space (UN/COPUOS) and the Space Working Group.

The Convention needed only eight ratifications to come into force. On 2 Nov 05, Malaysia became the eighth country (Ethiopia, Ireland, Nigeria, Oman, Pakistan, Panama and the USA were the earlier Countries) to ratify or accede to the Convention and the Protocol. This accession has great significance for the aviation community because it meant that the Protocol (which is the instrument that govern s the application of the Convention to aircraft objects) automatically **entered into force from 01** March 2006.WEF this date, the Convention applies to the sale, financing, and leasing of airframes, aircraft engines and helicopters in accordance with the terms of the Protocol.

LEASING AND FINANCING OF AIRCRAFT: A CRITICAL ANALYSIS

Given the staggering costs of large commercial airplanes, even made more critical in the wake of the recent US subprime crisis, airlines around the world have adopted new methods of financing their acquisitions of aircraft. In recent years, leasing - a legal concept developed in the United States - has become more and more important in financing expensive capital goods globally. Although leasing does not yet play a vital role in most aircraft financing comparable to its importance in the United States, the general opinion and trend is that it is having increasing significance on the market. This is especially so with the latest trend of low-cost carriers taking the airline industry by storm. Aircraft are already considered as “classical leasing objects”.

It is in this light that this paper seeks to investigate the nature and role of different modern methods of aircraft financing. Particularly, this paper will focus on three forms of aircraft finance namely debt finance; cross border leasing and operating leasing. These have emerged on the face of redundancy of such traditional methods of aircraft finance such as secured lending and leasing with no cross border element. The value of these modern methods of aircraft finance as a financial tool will be explored with reference to their unique capabilities and pitfalls. The paper will describe the aforementioned methods of aircraft finance in a multi-jurisdictional perspective including their legal and tax aspects. The analysis will extend to international and regional conventions on aircraft finance. It will also include an examination of the future prospects, issues and impediments with respect to the use of these methods in the global arena as well as local markets.

Airlines wishing to expand their fleet may either go in for a lease or go in for an outright purchase of new aircraft if finance is available on attractive terms. A 'dry lease' includes only the

aircraft whereas a 'wet lease' includes both aircraft and crew. The airlines are also charged for maintenance and insurance apart from the rentals. A lease is beneficial for an airline as it can be treated as expenditure. On the other hand a plane is generally purchased on credit and therefore treated as debt. Thus a leased aircraft helps the airline raise debt for other expenditure. The popularity of lease over purchase has resulted in lease rentals jumping by over 20 per cent in the past one year.

Purchasing marks the progression from leasing to owning the aircraft. As most purchases are made on credit the airlines' ability to raise future capital is evaluated before closing the sale. For the airlines price is the most critical factor. Discounts are given based on order size, future prospects of the airline and the prospects for the aviation industry in the operating country. Next the airline needs to consider various options as far as raising of finance is concerned. Usually one per cent of the aircraft costs have to be paid upfront by the airline. Export credit agencies like EXIM Bank and European Credit Agencies (ECA) also provide credit guarantees for a maximum of 85 per cent of the purchase price. Commercial loans are also available but work out to be more expensive. The airline may also raise finance from Private Equity players to fund the purchase.

Two options are available to an airline wishing to purchase a plane. A 'hire-purchase' lease allows the aircraft to be owned through a special purpose vehicle. At the end of the term of the lease the airline owns the asset and the last payment is made in a lump sum. Another option for purchasing is a sale-and-lease-back. The airline sells the aircraft to a leasing company, who then makes all the remaining payments. The leasing company leases the aircraft back to the airline and eventually becomes the owner of the aircraft.

THE CAPE TOWN CONVENTION: A NEW ERA FOR AIRCRAFT FINANCING

On November 16, 2001, the Convention on International Interests in Mobile Equipment (Convention) and the Protocol thereto on Matters Specific to Aircraft Equipment (Protocol) were opened for signature following three weeks of intensive work at a diplomatic conference in Cape Town, South Africa. Twenty-two other countries signed the treaty and are in the ratification process. Much of the Cape Town Convention is still uncertain as to its application.

The Cape Town Convention was drafted under the auspices of the International Institute for the Unification of Private Law (UNIDROIT). It is primarily intended to extend the benefits of a consistent registration and lien recordation and enforcement system to jurisdictions other than the U.S. that have less clear legal systems for financing. It was strongly supported by the U.S. State Department and the Export-Import Bank which is giving favored rates for aircraft financings to jurisdictions that adopt the Cape Town Convention.

The purpose is to facilitate aircraft financings by bringing a consistent system of creditors' rights and remedies to ratifying nations that do not have legal systems as comprehensive as in the U.S. The Cape Town Convention itself deals only with financing terms, not purchase and sale terms. The Protocol applies the Cape Town Convention to aircraft purchases and sales as a necessary part of the International Registry system.

The Convention contains the basic aspects of a legal regime for secured financing of equipment and the Protocol, then, contains the specialized provisions necessary to adapt the Convention to the financing of aircraft and aircraft engines. The Convention is not intended to operate on a stand-alone basis; it can be effective only in conjunction with a protocol covering a specific type of equipment.

The Convention and Protocol establish an international legal system for security interests in aircraft equipment (called "international interests" in the Convention). The goal is to facilitate efficient secured financing. During the next several years, manufacturers of commercial aircraft equipment hope to sell-and airlines worldwide hope to buy-trillions of dollars' worth of products. Yet, the local legal regimes in many states are inadequate to support secured asset-based financing. In the absence of legal reform, fewer transactions will take place and those that are completed will feature higher costs of financing and in some cases will require the sovereign credit of states in which airlines are based. The researchers in this paper would like to highlight the issues pertaining various matters pertaining to the financing of an aircraft under the Convention and Protocol and provide the necessary reforms.

Meaning of Aircraft Leasing: Aircraft leasing is a contract whereby the owner (lessor) of an asset agrees to another party (lessee) the exclusive rights to the use of asset (aircraft) for an agreed period of time, in return for of rent or premium which is to be paid periodically. In Indian context the word 'lease' is defined under section 107 of Transfer of Property Act, 1882 which deals with only immovable property only. Aircraft being the movable property so the appropriate word to be used is 'Bailment' of an Aircraft which is defined under section 148 of Indian Contract Act, 1872. In foreign context the word 'lease' could be used as the ICAO document (Manual of procedures for operations inspection, certificate and continued surveillance) and Regulation (EC) No. 1008/2008 (common Rule for the operation of Air service in community defines following:

Lease: a "...contractual agreement whereby a properly licensed air operator gains commercial control of an entire aircraft without transfer of ownership"

Lessor: "…the party from which aircraft is leased"

Lessee: "…the party to which aircraft is leased"

Concepts of Aircraft Leasing: The nature of leasing is a contract between the less or and lessee where lessor provides the right to use asset to lessee. The contract has its own specified time, referred to as the lease term for which the lessee is obliged to pay the installment as agreed between the lessor and lessee. Generally, a lease contract may not be cancelled by either party unless certain terms and conditions specified in the contract switch to its termination. A lease automatically terminated on the completion of the lease term unless renewed. At the expiry of the lease term, the lessee is usually required to return the asset (aircraft) to the lessor, unless the lessor provides an option to the lessee to purchase of the asset (aircraft). No separate act exit to do aircraft leasing. Neither the aircraft Act nor the Aircraft Rules contain any specific provision in this regard. As with leases in general, therefore, the provisions of the contract act will apply.

In order for there to be a valid lease there must be an offer and acceptance together with consideration. The parties must be competent to contract. Most airlines increasingly rely on aircraft leasing to large up front capital requirements and efficient way to purchase the aircraft. According to report, major airlines across the world had accumulated approximately 13,458 aircraft. The international Lease Finance Corporation (ILFC), estimates that one out of every three commercial aircraft is leased one. Thus the leasing is becoming more prevalent in the airline sector.

Types Of Aircraft Leasing

Basically there are two types of Aircraft Leasing: Dry lease and Wet lease.

*Dry Lease***:** A dry lease agreement is "… an agreement between undertakings pursuant to which the aircraft is operated under AOC of the lessee…"In Dry lease, an aircraft is leased without insurance, crew, ground staff, supporting equipment's, maintenance etc. Airlines enter into dry lease agreement which has its own flight and maintenance department and need aircraft only and no other services. Dry lease is used by the leasing companies and banks, requiring the lessee to put the aircraft on its own AOC and provide aircraft registration i.e. Aviation Regulation becomes the responsibility of the lessee. The tenure of the aircraft lease is more than two years and consist certain conditions regarding depreciation, maintenance, and insurance etc. and also depending upon the geographical and political circumstances etc.

Requirements of Dry lease in India

Registration of aircraft: - Operation of foreign aircrafts on dry lease requires registration of aircraft in India. The leased aircraft ought to have a valid Certificate of Registration ("CoR") and must be entered in the operating permit of the operator. According to Civil Aviation Requirement ("CAR") regulations, registration of aircrafts can be done either in Category A or B. For leased aircrafts, the registration falls under Category A. the registration of the aircraft is valid as long as the lease is in force and the aircraft is maintained in accordance with (i) the DGCA Regulations; (ii) the terms and conditions specified in the operator's permit; and (iii) the operator's maintenance control and operations manuals. The operator can apply to DGCA for extension of validity of the CoR. Airworthiness of the aircraft- once the aircraft is registered, the owner of his authorized representative has to apply to DGCA in a prescribed form together with the requisite fees prescribed in rule 62 of Aircraft Rules 1937 for obtaining CoA. An application for issue of Aircraft Noise Certificate is also to be made along with the CoA application. CoA is valid for a period of Twelve months. In case of imported aircraft, the validity begins from th date of issue of Export Certificate of Airworthiness and is restricted to the validity specified in the standard certificate of Airworthiness issued by the country of export.

Two types of Dry lease: There are two types of dry lease:

(a) An Operating lease; and (b) A finance lease.

An Operating lease: In case of an operating lease, the aircraft is leased for short period of time as compared to its total economic life. An operating lease is commonly used to acquire aircraft for a term of 2-8 Years. For instance, if the total economic life of aircraft is 20 years then under operating lease it may be leased upto 8 years, upon the end of the lease period, the lessee returns the leased aircraft to the lessor and there is no option of purchasing the aircraft. The lessee does not show aircraft into his balance sheet under operating lease.

Finance lease: The finance lease is also known as Capital Lease. Finance lease is long term lease and the lessee has the option to purchase the leased aircraft upon the expiration of leasing date and also includes:

- Lease payment more than 90% of the market value of the aircraft.
- The term of the lease is over 75% of the aircraft's usage life.

Wet lease: "… an agreement between air carriers pursuant to which the aircraft is operated under the AOC of the lessor…".A Wet lease provides the aircrew, maintenance, aircraft logs and other support function with the leased aircraft to lessee. A wet lease is beneficial to a company that wants an aircraft at its disposal but does not want the burden of hiring a flight department to fly and maintain aircraft. Over the years the aircraft leasing terminology has gone through many changes which may not reflect the service provided; for instance, in U.K wet lease use to mean, quite logically, 'including fuel'.

ADVANTAGES AND STRUCTURE OF AIRCRAFT LEASING

The advantages of aircraft leasing is as follows:

1. Full financing at fixed rates:The lessee is entitled to use an asset (aircraft) Without paying full cost-up-front which helps to conserve score cash.

2. Protection against Obsolescence: Leasing and asset reduces risk of obsolescence, and in many cases passes the risk in residual value to the lessor. If the asset value changes in a short period of time, lease is effective way to avoid such risk from lessee's end.

3. Less costly financing: Tax benefits that accrue to the leasing company or financial institution may sometimes be transferred to ht e lessee in lower rent payment form.

4. Flexibility: The agreement of lease may less restrictive provision as compared to other debt agreements. For e.g., a lease payment schedule can be structured to meet financial condition of the lessee. If you own the aircraft, you may have virtually complete control over its use. Depending upon the resale market for the aircraft and how long you are willing to hold it, you may be building equity. However, there is less flexibility with ownership. The aircraft you purchase may become obsolete or the company's aircraft needs may change over time. A substantial down payment may be required to purchase an aircraft, depleting the company's working capital and adversely affecting your debt-equity ratio. In addition, payments towards purchase may be higher than available lease arrangements. Some companies may be subject to requirements prohibiting aircraft ownership due to shareholder or insurance liability concerns.

A lease arrangement may be more flexible than purchase of an aircraft. A lease can enable a company to get in and out of aircraft use more easily through shorter-term commitments and without the prepayment penalties that might be triggered upon sale of a leased aircraft and the risks and responsibilities of aircraft ownership.

5. Attractive minimum tax problems: As the ownership of equipment results in an increase in tax liability under alternative minimum tax rules, companies can avoid the onerous alternative tax provisions by way of leasing equipment.

6. Off Balance Sheet Financing: depending on the type of leases, the lessee can treat lease transactions as off-balance sheet. This is critical to those companies wishing to increase borrowing capacity. Companies can avoid increasing balance sheet liability by leasing equipment instead of purchasing. One reason to choose a lease over purchase is that it can minimize the cash flow required to provide what is, in effect, a service (transportation), rather than an asset, necessary to company operations. In most cases, the company has no inherent interest in owning aircraft, only in using aircraft. Even companies in business directly involving aircraft, such as the airline industry, often lease. Currently, about half of the commercial aircraft operating worldwide are leased.

7. Tax-Advantage**:** Ownership of an aircraft will generally give you the right to depreciate it for tax purposes. However, only interest, not principal, will be deductible. For some companies facing potential Alternative Minimum Tax issues, a lease with fully-deductible payments could present advantages. Or, if the company has insufficient tax liabilities to take advantage of depreciation deductions, leasing might provide a cheaper method of acquiring use of an aircraft. Also, a company with international operations may have options, in terms of structuring the acquisition of aircraft that make the option of leasing more desirable than purchase.

8. Since lessors assume a residual value to the aircraft being leased, they can typically offer a lower rental payment. However, to optimize the cash flow benefit, leases usually must be for a longer term. In addition to freeing up cash, leasing also may help keep your lines of credit open.

9. Leasing also can remove long-term debt from the balance sheet. Under many lease agreements, lease rental payments will qualify as an expense, not debt, under applicable accounting rules. Companies looking to clean-up their balance sheets may prefer leasing to purchase of aircraft. You may, however, have to reflect your lease obligations in the footnotes to your financial statements.

MODULE III

AIRLINE TERMINAL AND SERVICE QUALITY MANAGEMENT

CUSTOMER RELATIONSHIP MANAGEMENT

MEANING AND CONCEPT OF CUSTOMER RELATIONSHIP MANAGEMENT

CRM (Customer Relationship Management), sometimes it is called customer management, customer value management, customer centricity, and customer-centric management. CRM has long been the buzzword for airlines aspiring to 'one-to-one' relationships with all customers, all of the time. Its underlying principles are well established too - those airlines that can effectively attract, serve and retain the best customers will see significant positive effects on their bottom line profitability. The deeper the relationship the airline holds with these customers, the more opportunities there will be for selling additional products and services. However, with the emergence of e-business and the 'new economy', the challenges of building strong customer relationships have become even greater. Within turbulent, highly competitive marketplace, airlines are finding it increasingly important to respond both quickly and effectively to changing patterns of customer demand. Who are airlines' customers and what are their needs and aspirations? If airlines don't know the profitability by customer, how can airlines be sure airlines are serving their best customers and applying their value to all business decision? If airlines had the means to do both, profits would soar. Not only would airlines become more efficient, the shareholders would see an investment in their only real source of revenue, the customer, and the meaningful profits that result. With so few new revenue opportunities, do airlines need more aircraft? Or instead should airlines consider a customer relationship management program that uncovers and maintains shareholder value. Airlines need to know and understand those customers who contribute the most to their bottom line.

Airlines in today's global marketplace are faced with increased competition and shirking profit margins. The challenge is sustaining and creating profits in the face of heavier competition and product homogenization. The opportunities are in managing customer relationships, controlling costs and applying customer profitability to the entire business.

Imhoff defines customer as: "A party who is involved with the acquisition of the companies' goods and services and who is of interest to the organization." (Imhoff et al, 2001)

In this definition, customers can be either individuals or organizations. Customers can also be loose group of individuals joined together as a membership organization, such as the Civil Aviation Authority (CAA) in UK.

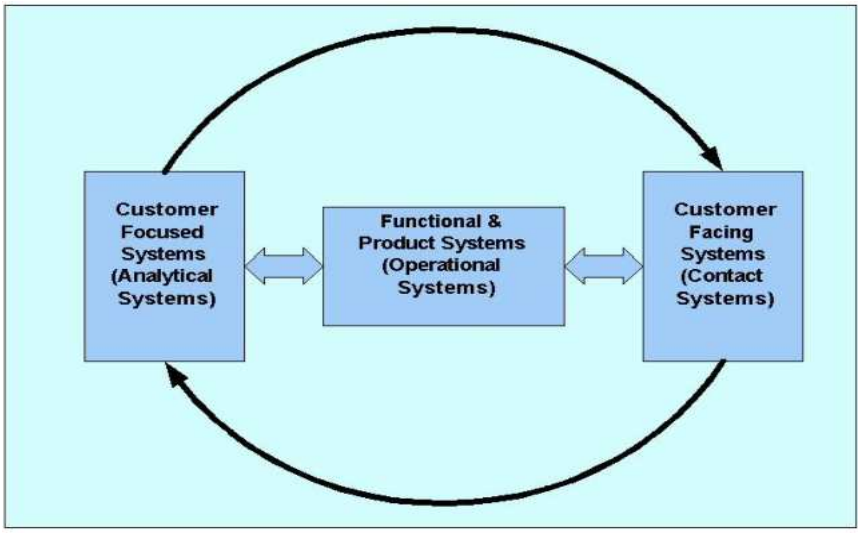
They also list some customer types according to their definition, such as Agent, Beneficiary, Bill payer, Customer Competitor, Employee, Guarantor, Household, Prospect, Referral source, Supplier Customer is defined airline passenger only.

Definition of CRM (Customer Relationship Management)

First of all, it must be understood that at its core, CRM is more than just a set of technologies: it is a process. This fact will be of significant importance to Information Technology (IT) professionals who will be asked to support CRM with information and applications. Furthermore, it is intended to be a repeatable process to ensure ongoing, continually improving, and consistent results. Simply stated, CRM comprises the acquisition and deployment of knowledge about customers to enable a airline to sell more of their product and service more efficiently.

Providing customers with a good experience however and whenever they choose to contact you is a key part of managing relationships with them. Ovum defines customer relationship management (or CRM) as: A management approach that enables organizations to identify, attract and increase retention of profitable customers, by managing relationships with them.

This definition deliberately makes no mention of any particular means of communication, or channels, whether 'traditional' (mail, telephone, in person) or new (email, Web, wireless devices, interactive television). It also makes no mention of process management technology; while implementing CRM is certain to involve the deployment of new technologies, it requires a re-examination of business processes, which should lead technology decisions, and not vice versa. The principles of CRM apply equally, regardless of the channel to the customer. However, the first wave of CRM, which came to prominence in 1998, centered on 'traditional' channels - supporting front-office personnel communicating mainly by telephone, but also by fax and mail, as well as field personnel. The following figure illustrates the key elements of the CRM architecture:



In the competitive travel industry, customer satisfaction no longer guarantees customer loyalty. Deregulation, increased parity of products, the availability of new and diverse direct distribution channels, industry alliances, and many other factors have combined to force operators in the

Airline industry to focus on new differentiators in order to maintain current and develop greater market share.

In response to this new environment, travel providers are undertaking initiatives centered on identifying, developing and retaining high-value customers, under the overall banner of customer relationship management or CRM.

Customer Relationship Management (CRM) can thus be designated as a disciplined application of customer information to build customer relationships through:

- Continually refining insights into customer needs, habits, and economics
- Developing targeted and tailored value propositions based on those inputs
- Strategically focusing business resources on activities that build long-term customer and economic value.

CRM includes the methodologies, technology and capabilities that help an enterprise manage customer relationships. The general purpose of CRM is to enable organizations to better manage their customers through the introduction of reliable systems, processes and proceduresCustomer Relationship Management is a corporate level strategy which focuses on creating and maintaining lasting relationships with its customers. Although there are several commercial CRM software packages on the market which support CRM strategy, it is not a technology itself.

Rather, a holistic change in an organizations philosophy which places emphasis on the customer.

A successful CRM strategy cannot be implemented by simply installing and integrating a software package and will not happen over night. Changes must occur at all levels including policies and processes, front of house customer service, employee training, marketing, systems and information management; all aspects of the business must be reshaped to be customer driven.

To be effective, the CRM process needs to be integrated end-to-end across marketing, sales, and customer service. A good CRM program needs to:

- Identify customer success factors
- Create a customer-based culture
- Adopt customer-based measures
- Develop an end-to-end process to serve customers
- Recommend what questions to ask to help a customer solve a problem
- Recommend what to tell a customer with a complaint about a purchase
- Track all aspects of selling to customers and prospects as well as customer support.

When setting up a CRM segment for a company it might first want to identify what profile aspects it feels are relevant to its business, such as what information it needs to serve its customers, the customer's past financial history, the effects of the CRM segment and what information is not useful. Being able to eliminate unwanted information can be a large aspect of implementing CRM systems. When designing a CRM's structure, a company may want to

consider keeping more extensive information on their primary customers and keeping less extensive details on the low-margin clients.

What is e-CRM?

Today, more and more airlines are using the Internet to implement e-business applications and CRM strategy. These applications can be very resource intensive. e-CRM is interest intensified in managing customer relationship through the Internet, and many airlines approached this as a separate project to their e-business strategy.

What differentiates airlines in today's hyper-competitive and demand-driven markets is their ability to address their customers' preferences and priorities. This means more than simply knowing and understanding their customers better than their competitors do. It means strategically implementing this customer knowledge in every area of the airline, from the highest management level to all the employees who come into direct contact with customers.

Establishing and strengthening long-term relationships with airline's customers is the key to success. It's the focus of a well-structured and coordinated process of customer relationship management.

e-CRM involves far more than automating processes in sales, marketing, and service and then increasing the efficiency of these processes. It involves conducting interactions with customers on a more informed basis and individually tailoring them to customers' needs.

Business Drivers--Why CRM?

There are three primary reasons why CRM has taken hold as rapidly as it has:

1. Competition is fierce;
2. The economics of customer retention are unequivocal;
3. Technology allows airlines to do this more effectively and profitably today.

The return on CRM methods

There are only three ways to increase the profitability of a customer base; acquire more customers, optimize the value of existing customers, or retain the right customers longer. All of these benefits must be achieved with lower costs.

As the economic climate continues to become more competitive, the fight over customers intensifies. Of the three choices above, acquiring new customers is the most expensive. Research shows that acquiring a new customer costs 5 to 10 times more than retaining an existing one. Studies also show that loyal customers will buy more over their lifetime and are willing to pay a premium for doing business with someone they like and trust. Therefore, while organisations will clearly continue looking for new customers, once acquired, they now know that it is worth a significant investment to keep them. CRM is a way to do that.

Airline CRM

We defined what we mean by CRM, now it's the time to more focus on Airline CRM. In this section we define a sample model of Airline electronic CRM and elaborate what we expect from it. We all know that airline's success depends heavily on its ability to intelligently manage sales, marketing, and service processes and to draw mutual advantages from understanding of airline's customers. To help airline maximize the strategic value of customer centric initiatives, Airline e-CRM model provides a comprehensive analytical solution, it can contribute toward improving the way that measure and optimize airline's relationships with customers. Airline eCRMmodel can be conceptualized as a system that is made up of components, linkages amongst the components, and dynamics that takes advantage of the properties of the Internet and relationship to make money. It takes advantage of the properties of the Internet in the way it builds each of the components-value, scope, revenue sources, pricing, connected activities, implementation, capabilities, sustainability and crafts the linkages among these components. It is what, preferably, enables an airline to have a sustainable competitive advantage. It includes three components (subsystem): Web Base Airline-Passenger Interaction subsystem; Airline Data Warehouse subsystem; and Airline e-CRM operation subsystem. Airline e-CRM model is an asset-based solution that includes best-of-breed components to build an e-CRM infrastructure and enable any-channel, any-time communication with customers. At the heart of this offering is the CRM Foundation, which includes the CRM data model, starter set of CRM queries, reports and analysis, sample data, a demonstration prototype, data utilities and scripts, and comprehensive documentation that covers implementation guidelines, business perspective and analysis guidelines, system components, data model descriptions, and use and customization guidelines.

Since managing customer interactions is a vital piece of the e-CRM puzzle, planning and implementing a Multi-Channel Interaction Management solution with the other subsystems and enterprise solutions is crucial. Without Interaction Management, the puzzle remains incomplete. Interaction Management is the foundation for evolving customer service into customer satisfaction by tying together all customer data - no matter where it is located within the enterprise. Making this information easily and quickly accessible to the customer management process, and ensuring each customer is handled in the most efficient and effective way possible is the ultimate result of a well-defined and deployed strategy and solution.

Airline e-CRM model also:

- Provides an understanding of customer behavior and enables airlines to measure results of marketing and merchandising changes.
- Supports more effective promotions through integration of data between marketing and merchandising users.
- Provides a single view of customers across the enterprise and across contact points.
- Gives airlines the ability to respond more dynamically and quickly to market demands.

A vexing question for a number of airlines is how much value does customer relationship management, or CRM, really deliver to the bottom line and how does an airline go about getting it? While this question remains unanswered, many skeptical senior managers will continue to pay lip service the strategic importance of a customer-centric perspective and will continue with business as usual. Applied Technologies Group's investigation of 17 world-class airlines has clear indicated that significant revenue improvements.

This revenue increase comes from three areas:

- Re-attracting defected customers, which accounts for between 0.1 and 0.3% of revenues;
- Increasing the share of a customer's travel wallet, which accounts for 0.3 and 1.2% of revenues;
- Acquiring new customers, this accounts for approximately 0.05% of revenues.

Naturally, associated with these revenues are costs, but this only amount between 0.3 and 0.6% of the existing cost base:

- The marginal additional flights needed as incentives estimated to be between 0.2 and 0.4% of costs;
- Additional CRM initiatives amounting to between 0.2 and 0.5% of costs.

Savings in costs due to more efficient and targeted running of the existing CRM program, providing a reduction of 0.1 to 0.3% of costs;

As stated above, the bottom line impact of CRM is significant, but varies according to the airline implementing the initiatives. The range estimates are:

- For a large airline: $100-$250 million per year;
- For a midsize airline: $25-$60 million per year;
- For a smaller airline: $15-$50 million per year.

There are many benefits to be gained for airlines and airline passengers, firstly, passengers could book and check in through internet 24 hours, 7 days a week, at any time, any where. Secondly, airlines could reduce sales cost. American Southwest Airlines CEO, Gary Kelly said the Web site is playing a major role in mitigating the rise in unit costs affected by high fuel prices. It's 10 times cheaper to deliver to customers through the online service than through a travel agent, Kelly said, and costs 5 times less than using Southwest's own reservation staff. The booking cost per passenger online is "well under $1," said Kelly, and is scaling down even further. He said Internet use by passengers was helping the carrier keep fares at low discount levels. (Aviation Week &Space Technology/March 6, 2000, p38).

Massive investment in both business-to-business (B2B) and business-to-customer (B2C) information systems is expected to translate into important cost savings in procurement, sales, billing and other support activities. The airline's fully automatic ordering system, for example, should reduce order processing costs by 90%, according to Chairman/CEO Jorgen Weber of Lufthansa Aviation Group. (Aviation Week & Space Technology/May 15, 2000, p40).

Customers enjoy personal treatment, together with appropriate advice on getting the best out of their purchases. The airline may also put customers in touch with others with whom they have similarities, for example by inviting them to meetings.

For the airlines implementing CRM, it becomes possible to single out customers who are profitable, gaining an understanding of their preferences to improve retention and increase the volumes sold. These valuable customers can become advocates for the airline and its products.

Finally, CRM helps an airline to build loyalty. Because it is a marketing truism that it costs five times more to generate new customers than it does to retain existing ones, that is a compelling argument.

With e-CRM, airlines can increase sales and customer loyalty. This strategy can improve sales effectiveness, bring higher value to all of airline's key business relationships, help airline to understand what each client relationship is truly worth, develop and reinforce a consistent experience for customers, improve management effectiveness, improve tactical and strategic planning, respond faster to competitive challenges, use critical resources more efficiently, and reduce administrative burdens and overall cost.

PASSENGER MANAGEMENT

Check-In Process

Checking in is a key process which is to be followed in airports. Currently there are numerous methods through which the passengers can check in for their flights apart from using the traditional desk check-in.

Alternate forms of check-in initially involved self-check in services at kiosks airports and then remote methods like mobile services and internet. With regards to the check-in kiosks these started approximately ten years ago at the airports. They were primarily installed by the airports for their own use i.e. the propriety kiosks. This was an inevitable development as the airline industry saw as to how the self-service technologies in other industries such as banking had lowered down the costs, increased productivity and reduced customer waiting time. At the same time better use of scarce space was made at the airports. This was followed by the development of the common use self check-in (CUSS) kiosks which allowed the airlines to share self-service resources. There had been a similar trend with traditional check-in desks where common use terminal equipment (CUTE) had been introduced in the early 1980s. the earliest CUSS kiosks were installed in Vancouver and Narita airports in 2002. In 2006 around 29% of all passengers used some type of self-check-in kiosks and this was expected to rise to 49% by the end of 2008. The usage of the system varied considerably with nearly 58% of Americans using this self-service method while its equivalent use in Africa and Middle East was merely 10 %.

Initially airlines developed dedicated desks to differentiate themselves from others and to give themselves that competitive advantage particularly to their frequent flyers. The kiosks were branded with their name and identity. However there were no common standard for these

dedicated kiosks and hence the investment and the maintenance costs also proved to be very high particularly when the airports being served was not a major base for the airlines.

Hence the CUSS kiosks were developed which allowed the costs to be shared between different airlines and less airport counter staff. However the airlines would lose the individual control over the check-in process and the cost which they incur and are no longer able to differentiate this aspect of their product.

For the airports the CUSS system provides more flexibility just as the CUTE system when it was introduced as it allows for terminal space to be used for efficiently. This may enable a higher volume of passengers to be handled without the necessity of expanding the terminal. The check-in facilities could be placed in the most convenient places in the terminal and spread out if needs be to avoid crowding. In theory the space no longer needed to be check-in ccan also be used for retail opportunities although this may well require considerable reconfiguration of the overall space to place these new facilities in an appropriate location. In most cases it is the airports which owns the kiosks and then charges the airlines but in rare cases it may be the airlines themselves or their handling agents.

As far as the passenger is concerned, both the types of kiosks provide facilities for easier and faster check-in but the CUSS system gives them most flexibility to check in anywhere regardless of their airlines and can thus eliminate any confusion of multiple dedicated terminals. IATA has estimated the average check-in time to be around 3.5 minutes but with self-check-in kiosks, this has reduced to 2.5 minutes or even 1.5 minutes if there is no hold on the baggage.

Kiosks could be placed not only in traditional check-in areas but also at other places in the terminal and off the terminal sites such as car parks, train stations, car rental return facilities, hotels, cruise ships which can reduce check-in queues in actual terminals and give passenger extra convenience and control. For instance in the Las Vegas airport, CUSS Programme i.e. ‘Airport Speed Check’ was launched in 2003 and subsequently developed to include remote check-in as well. It has a goal of having at least 10 % passengers with bags check-in remotely. It has kiosks in two hotels, convention center, car-rental facilities which can hold baggage. In February 2004, there were only 10 airports using the CUSS system, but by the end of 2008 this number increased to 86 with the largest number being in Europe.

Increasing usage of kiosks is one the major aims of IATA’s ‘Simplifying the Business’ initiative which was launched in 2004 to use technology to streamline processes and reduce complexities and costs. In addition to CUSS kiosks the other five focus areas are electronic ticketing, bar coded boarding passes, radio frequency identification for baggage management and paper-less cargo movement. More recently two other initiatives related to reducing the number of mishandled baggage and to encourage fast travel have also been launched.

The most basic self-check-in kiosks would verify the passenger’s identity and print the boarding pass. Some may allow for meal and seat choices to be made and some may also read travel documents such as passports and visas. But one of the key issues in this concept is to hold baggage check-in. Once the self-service check in is completed passengers have to queue up at the

individual airline desks to check in their luggage. Many machines have tried to overcome this problem by being able to print baggage tags so that passenger themselves can tag their baggage and drop them off at a common baggage drop. But this is not allowed in all countries and in 2007 only 18% of the airports across the world had offered this facility.

In more recent years, mobile and web check-in has become a new trend. This is less costly for the airlines as they don't have to install kiosks or use CUSS and the passenger print their own boarding pass.

There is currently a very active debate on whether self-check-in kiosks were an interim solution to improve check-in process and they would ultimately need not be needed as check-in remotely using PCs or mobiles is cheaper for airlines and more convenient for passengers. However such remote technology is not always available to the passengers particularly is they are away from home. Moreover using such system are not always seamless or without the issues of security or gate staff.

Bio-Metric Identification and Registered Passenger Schemes

A Registered Passenger scheme is 'where interested passengers would apply to a national authority, be subjected to a risk assessment and, if that were successful, be registered as someone presenting a low risk to aviation security. When departing from an airport in the European Community, RPs would be exempted from certain security checks after identification.' In certain places, an alternative definition of an RP scheme is introduced in this report – one that does not exempt or minimize the security checks to which RPs would be subject. Instead, this approach offers RPs an improved passenger experience through privileges such as fast tracking through accelerated security checks coupled with better customer service. The report explicitly specifies when this definition is being used.
There are three key stages to an RP scheme that need to be considered when assessing the most promising approach to international recognition:

- Enrollment
- Risk Assessment and
- Identification at the airports

Biometrics, on the other hand, is a generic term used to refer to a physiological or behavioral characteristic that can be measured to verify the identity of an individual. Physiological biometrics measure a part of an individual's anatomy, e.g. fingerprint, hand, face, and iris; behavioral biometrics measure an action performed by an individual, e.g. voice, signature; in both cases the characteristics have to be identifiable, universal, unique and permanent.

Biometrics can be used to "verify" or "identify" a specific individual's identity. Verification (authentication) refers to the problem of confirming or denying a person's claimed identity (Am I who I claim I am?). Identification refers to the problem of establishing and or authenticating a subject's specific identity (see more formal definitions at end).
Biometric systems have a series of key processes that have to be completed in order to:

- allow a person to use the system.
- achieve verification or authentication of a user's identity.

These key processes include:

- Enrolment – the capture of the raw biometric
- Template creation – preserving the biometric via the use of an algorithm to extract a template from the image captured that will subsequently allow the image to be compared to others using the same algorithm.
- Identification – takes new biometric samples and compares them to saved templates of all enrolled users.
- Verification – takes new biometric samples of a specific user and compares them to old samples taken from the same user.

These processes can also be developed as follows:

- Enrolment process, the individual provides a sample of the biometric which is captured by a device (e.g. a camera or a scanner). Information is extracted from this sample to create a biometric representation (template) which is recorded on a storage medium(e.g. chip or barcode).
- Authentication/verification process: The individual provides a sample of the biometric previously recorded on the storage medium. The representation created from this sample is compared to the (stored) reference representation. As no two biometric representations are exactly identical, the authentication process must determine whether the samples are a close match.

In terms of the main objective of biometrics systems, i.e. the authentication process, the challenge is to achieve a high level of accuracy in the identity confirmation of any given individual. This involves developing a system that minimizes two key problems:

- Incorrectly matching a sample biometric representation of one individual with the reference biometric representation for another individual (False Acceptance Rate).
- Failing to recognize a match between a sample biometric representation of an individual with the reference biometric representation of that same individual (False Rejection Rate).

Identifying individuals upon check-in and before they board a plane is extremely important in ensuring safe air travel. Biometric travel document reconciliation systems achieve this specific function. The biometrics of an individual should be used to ensure that the passenger boarding an aircraft is the same person as the one who checked in; if necessary, an individual's biometric data can also be matched against a "watch list" to prevent undesirable persons from boarding.

From check-in counters to boarding gates, biometric templates can either be written on the boarding pass (ATB magnetic stripe and/or 2D bar codes) or transmitted by the Departure Control System network, in which case a provisional database is needed. This procedure takes

little time and can be completed during the normal check-in boarding process; therefore takes no extra strain is put on the congestion of the airport. The implementation of biometrics on a Common Use (or airline dedicated) Self Service kiosk can be a viable way to capture the passenger's biometrics upon check-in.

Airport Security

The airport should provide the necessary know-how and flexibility to achieve the integration, automation and interoperability of security systems, based on biometric recognition technology. This technology should support smooth facilitation and passenger flow within the terminal. The goal of airport security systems should be to ensure unequivocal passenger identification and to monitor passenger movement from profiling / check-in, through to boarding at the corresponding gate. Passenger identity should be checked by the system against Interpol and national watch-lists of criminals and terrorists. This would provide a significant increase in security, relying on biometric identity confirmation of passengers at each control point, from check-in until they board the right aircraft, thus avoiding identity switches or the use of fraudulent documents.

The systems to be implemented should speed up the validation processes for individuals and their travel documents. In this way, without unnecessary intrusion into a passenger's privacy, the passenger should perceive both a higher level of security and easier passage. Airport management should allocate sufficient human and budget resources to the tasks of implementation, infrastructure adaptation, maintenance and upgrading.

Biometrics and Other Systems:

Biometrics can be used at airports to secure and facilitate a variety of other systems than border control, passenger facilitation and access control. For example biometrics can play a role in:

- Employee background checks: as with corporate security, background checks have become increasingly vital to ensuring airport security. Airport authorities should conduct criminal record verifications using fingerprint identification for employees who deal with sensitive information or work on the aprons close to the aircraft. Good management practices and regulations dictate that record checks should be completed prior to employment or assignment to confidential tasks. Fingerprint capture stations can enroll staff and match their fingerprint templates with large existing forensic data bases, making background checks easier, faster and more reliable.

- Logical access control: airports are increasingly dependent on computer systems and the Internet and are therefore exposed to network hacking. This can be a major risk for airport operations and constitute a serious threat to civil aviation. Biometric log-in on client/ server software can add the functions necessary to secure any network biometrically. Logical access control, log-in and password management (single sign-on), encryption, certificate activation and Incompatibility are some of the ways airport network and computer systems can be secured.

ICAO's Recommendation on Bio-Metric System:

ICAO has developed standards for biometrically-enabled MRTDs. These standards concern passports (sometimes known as "e-passports") and related documents such as visas and ID cards, for border control purposes, but may also be utilized by airports developing biometric systems for other purposes, be it for passenger facilitation or access control. Regarding the choice of biometric technology for border control, the direction given by ICAO is that face recognition is the primary biometric identifier, assuring global interoperability, and one or two additional, but optional, biometric identifiers - fingerprint and/or iris – as decided by each issuing State.

For purposes other than border control, it may not be necessary to use more than one biometric technology, as this will risk making the systems more complex, both for passengers and operators, and increasing the cost.

Application of Bio-Metric System:

1. Border Control: In general, the introduction of biometrics in MRTDs is a government issue therefore this implies that the costs of adapting the passport control booths at airports to be able to accept these new documents must be borne by governments. The following are the guidelines for the use of bio-metrics for border control:

    a. Performance: The performance of a biometrically enabled border control system should be determined by the national regulators in accordance with the standards set by ICAO. A key factor in the performance of any system is that it must improve the passenger processing time and enhance the through-put of passengers. When designing and implementing the system, the airport operator and border control agencies should also ensure that the system contains fallback procedures in the event that a passenger is not recognized by the system and must be manually processed.

    b. Standards: The biometric standards for MRTDs are set internationally by ICAO and implemented by national Border Control agencies. ACI members support the adoption of these standards internationally. Common standards for privacy and data protection should be defined between the appropriate agencies of each State.

    c. Facilities: Eventually, biometric systems will need to be installed at all airports where the national authorities wish to benefit from them, and should be managed to complement the more traditional identification procedures. Airports urge the regulatory agencies to consult and coordinate on planning and design of the layout, and integration of the Border Control facilities within the existing airport spaces. When designing a facility, there are many points to consider. System performance is a vital element; however, special attention must be paid to the flow of passengers through the layout / footprint of the system within the airport's facilities. In order to cater for this important facilitation aspect, the design of the system should reflect ergonomic considerations. Two other important items are that the process should be self-explanatory- the usage of the system should be intuitive to all users to avoid

slow processing times, and the systems should meet passengers' requirements related to cultural and hygiene factors.

d. Technology: For the most part, the choice of technology is determined by the regulatory agencies. However, in order to facilitate interoperability, agencies should consider utilizing existing airport communications systems and infrastructure when implementing their technology– i.e. databases, communications, cabling, network, etc.

e. Costs: Airports request that the regulatory agencies consult them and coordinate with them on the costs and design of the systems to be implemented. The introduction of automated systems should not subject the airport to higher costs than conventional booths, such as the cost of additional or adjusted infrastructure. Costs must be borne by the agencies and not by airports, for example the airports are within their rights to charge a rental fee to the agencies on usage of airport facilities and infrastructure.

2. Passenger Facilitation:

The use of biometrics for passenger facilitation will benefit air carriers (which may use them in the first instance to provide a higher level of service to their premium passengers and members of their frequent flier programmes) and government authorities through the use of ICAO and ISO MRTD standards. Airport operators may also benefit from the use o biometric systems to improve passenger throughput; however, the impact on the airport' passenger handling capacity will be largely dependent on how air carriers decide to deploy biometric systems. A "common-user" interface approach for biometrics benefit airport operators for check-in, security screening, passenger segregation boarding and border clearance. A proliferation of different biometric systems amongst air carriers and between air carriers and border control authorities would not deliver an improvement in passenger handling. Checking that a passenger's identity is consistent throughout all the processes - check-in, border crossing, passenger security check and boarding the aircraft - is the key to ensure that the right person is boarding the right aircraft and that the person boarding is also the same person who has undergone all of the earlier processes. If the passenger uses the same token in all these processes, it is quite obvious that there are benefits to be gained. As the use of a travel document is relatively widespread in other processes at airports, and even within airline processes, it can be foreseen that MRTDs with biometric identifiers will swiftly be incorporated into these processes. The normal chain of processes that a passenger undergoes at an airport shows that a passport is not only used for border control; the check-in process has a link with the passport as does the boarding process.

Airport operators and air carriers should work together to ensure that regulators apply the same biometric identifiers for border control as for the check-in and boarding processes in order to facilitate quicker passenger flows. In terms of air carrier frequent flier programmes, airport operators encourage air carriers to employ common user systems to avoid the proliferation of biometric systems at dedicated self-service check-in points and dedicated check-in and boarding check points. The use of common biometric

representations for air carrier frequent flier programmes should be considered. The integration of ICAO Standard MRTDs with ICAO selected biometrics into the airline process may render redundant the need to use an airline frequent flier card.

3. Security Access Control: Airports reserve the right to determine which biometric technology (equipment and template)is appropriate for deployment in their staff access control system and infrastructure. In its most basic form, airport security managers are looking for a solution which ensures that flight crew and airport personnel are positively identified or verified and granted appropriate access into security restricted areas. Until now, airport security for staff access has been reliant on a series of tried and tested procedures coupled with conventional token or PIN-based access control security solutions. With the recent emergence of biometric identification technology a new capability can be introduced, enabling security managers to allow access to secure areas on the basis that they are able to identify who an individual is, as opposed to what they are carrying or what they know.

   The use of a credential with an employee's biometric template for access control is extremely important since, unlike the passenger handling process, access control points for employees can be automated and therefore do not necessarily have to be manned by security staff, unless otherwise required by national law. Biometric technology for security access control in airports has been applied relatively slowly due to four key factors:

   - "Over-promise" and under-delivery by biometric technology vendors. This issue has already started to disappear as vendors become aware that for a technology to be adopted on a mass scale, the 'customer' must be made aware of the weaknesses as well as the strengths of the technology they represent; all too often, trials do not fulfil the expectations of security managers.
   - Fast progress of biometric technology capabilities. This factor is being mitigated as the leading biometric contenders for various application areas become apparent; however, an element of risk – albeit an informed risk – will always exist in the selection decision.
   - Lack of a biometric interoperability standard. This factor is being addressed by the vendors and the biometrics industry in general, because they understand that airports want to be able to utilize different pieces of hardware within their existing access control system.
   - The lack of a cohesive approach from regulating bodies. This factor is the biggest cause for concern: without the appropriate level of guidance from regulators, airports will remain intransigent on the decision of adopting biometric technology.

Passengers with Special Needs and Medical Conditions

IATA has formulated a comprehensive policy for the airlines mandating the establishment of an Airline Medical Department and provides for the role of the airline companies in respect to those passengers who require special medical assistance.

The airline medical department has wide ranging responsibilities that affect virtually every aspect of the airline operation and those using it. The areas of responsibility fall into two main categories:

- the health of the passenger;
- the health of the employee.

For the purposes of this chapter, we will concentrate on the role of airlines towards the health of the passengers and effectively managing the same in pursuance of the IATA guidelines.

The airline is responsible for carrying its passengers safely and efficiently to the destination. The airline has no real means of ensuring that all passengers are fit to begin their journey. The medical department is responsible for ensuring, as far as possible, that passenger health does not deteriorate during the journey, and that there are adequate measures in place to deal with any unforeseen in-flight medical emergency. Due to the marked increase of the number of airline passengers travelling abroad, the practice of Travel Medicine and proper medical advice to the passenger by the airline medical department has assumed great importance and is a major factor in successful airline operations.
Many passengers have real or perceived concerns about their flight and the medical department is available to answer those queries whether they come from passengers directly, or indirectly through travel agents or the airlines‘ sales agents. The use of pamphlets at points of sales, and in ticket wallets, airline internet sites and in-flight magazines are all useful vehicles to provide important health information and advice for passengers and their medical advisors.

Recently passengers and the media in general have become acutely aware of medical and quasi-medical issues that might be associated with flying. Much has been made of cramped seating, obsolete regulatory requirements, cabin environment, stress of travelling etc, but the fact remains that customers wish to travel quickly, cheaply and safely to their destination. They have a responsibility to ensure that they are healthy enough to do so. The airline and its medical department have a responsibility to ensure that the flight does not have any adverse effects on those travelling. Medical Manual Airline medical departments have been catapulted into the forefront of public and media interest.

They need to provide a balanced scientifically based view, keeping abreast of medical research, using proven medical data which is made widely available to all. The carriage of incapacitated, handicapped or disabled passengers is an important aspect of air travel.

Acceptance of the incapacitated passenger for travel requires input from the airline medical department, coordinating, where appropriate, with the passenger‘s medical advisor and the airlines’ reservations, ticketing and operational departments.

Role of Airline Management:

Medical Confidentiality

It is important that all who work in a medical department should understand the rules which govern medical ethics, particularly the commitment to medical confidentiality. Although management may request a medical assessment to ascertain a person‘s fitness for a particular job, the ethics of the medical profession must be maintained. In general, the health professional may provide management with reports on fitness for work, appropriate limitations and likely duration. Medical information has no place in such a report and must not be included without written consent from the individual concerned.

Where an employee consults an airline health professional because of personal problems or symptoms of a clinical nature, such a consultation must conform to the normal rules of medical confidentiality.

There are circumstances which may be extremely sensitive but which may have serious implications in terms of safety of passengers or other employees. Such situations require considerable judgement on the part of the physician who must weigh the rights of the individual against the safety and rights of others. Discussion with a senior colleague is essential to ensure an appropriate outcome.

Advice to management on corporate health matters is not subject to the rules of confidentiality. It is the duty of the airline physician to be alert to all general matters of health and to communicate early trends to management. Only in this way can the health of Company personnel be properly safeguarded.

Insurance and Disability

Some airlines have comprehensive insurance schemes for their employees which provide cover for health, illness, accident, death, or loss of licence.

The airline medical department may be required to work in close conjunction with the insurers and insurance department of the airline, to provide accurate information and to ensure the claimant is both properly investigated and treated and also that the claim is justified. Informed consent to release of confidential medical information from the employee is essential.

Some airlines will ―self-insure‖ for some of these contingencies and the onus then falls especially on the medical department to ensure that a fair and reasonable balance is struck between employee claim and investigation and the corporate response. Claims should be properly investigated and reported on by the medical department in an impartial way to ensure that the employee is fairly treated. Occasionally, the employee or the employee‘s union will attempt to steer the investigation or management of such a claim by suggesting or demanding use of experts specifically designated by them. That is not in the airline‘s best interest, and the airline medical department should ensure that they seek, on behalf of the company the best, most independent and expert opinion available.

Medico-Legal

The airline medical department must be prepared to work closely with the legal department on claims of a medical nature against the company as well as any other legal matters requiring medical input. These claims may come from either passengers or employee, and the legal department will look to the medical department for expert medical advice and evidence.

Customer Relations

Customer enquiries and complaints may have a medical content or demand some medical explanation. This may range from complaints of ―food poisoning on the flight‖ to allegations of injuries or illnesses caused during the flight. The types of complaint are extensive and the medical department is frequently called upon by the airline Customer Relations department to provide explanation or advice.

HUMAN RESOURCE MANAGEMENT IN AIRLINE INDUSTRY

BUILDING AVIATION MANAGEMENT LEADERSHIP

Change of ownership including privatization may not be of particular concern to some planners, as they seem to feel that regardless of the ownership, airport/airline business imperatives and issues remain unchanged. While it may be so, the key issue is transformational management and aviation leaders have to successfully manage its resources before moving on to other priority areas.

When you say, customize your airline/airport the key component here is customers. Most of the internal customers on-site at airports/airlines are employed by airlines and other service providers and not by airport operators. While most airport based providers can focus their attention on one primary customer group, such as airlines and their passengers, airport leaders face a multitude of constituents, many of whom are in direct or indirect conflict over resources-passengers, airline tenants, special interest groups, even regulators and other airports. Airport/Airline Leaders who can simultaneously manage the demands of these diverse consistent groups will be highly valued. Airport/Airline Managers are rightly called as 'Aviation Leaders' – he should be a team leader, personal credibility to gain trust and respect with airport employees and stakeholders alike. An airport leader should be a good negotiator to convince new carriers to serve the airport or existing ones to add routes, to optimize the use of facilities, given the capacity and service constraints. He should be a community player – to create for the airport a positive image in the community, to foster community support for expansion plans and dealing with sensitive issues such as noise and incompatible land use and environmental issues. With the increased emphasis on non-aeronautical revenue, it is only logical to see commercial

development as a key area and the need for strong planners and strategists capable of accurately forecasting demand and putting in place a multi constituent planning processes. Team Leadership is therefore by far the single most skill, followed by commercial development and change management skills. This means Airport Leaders must, above all, be good leaders of people who are adept at charting and communicating a clear organizational direction. Ability to adapt to rapid changes and takes a flexible, dynamic approach to leadership in the evolving airport development and operating environment. Wedged between these leadership imperatives is commercial development making it clear that airport leaders must be commercially oriented towards identifying, pursuing and consummating attractive commercial development deals for their airport business. Pricing and negotiation of major concession agreements may also point to a need for strong financial expertise. Expertise in the ICT field will be an added advantage to keep up with other industries in their strategic use of technology. What then required for success are, the right mindset and the capacity and commitment to lead. A committed leader is one what the industry would need and he will be the one who can deliver the goods. Airports Leaders have to maintain the initiative, lead rather than follow, anticipate rather than react.

This means that executives who are capable of planning and over seeing large projects and who can envisage solutions to future issues or problems, successfully communicate these to a multitude of constituent groups, and then doggedly pursue their goals are best suited to airport environment.

Team Building

"The most valuable players are not necessarily the highest scorers, they are often players who help create a situation in which their team scores"

An effective teamwork gives you the benefits of increased productivity, better use of resources, cost reduction, innovation and creativity, improved quality, better customer service and higher quality decisions. A person who commands the group's respect stands the best chance of getting everyone to commit to the team process and of overcoming resistance. Managing and Leading are different, in that some feels that the Managers do things right, whereas, Leaders do the right things. What kind of training is needed to get the best out of airport leaders?

Civil Aviation Training

Civil Aviation needs the most dynamic self-starter managers and how do we get such managers? Training is the only answer. "Civil Aviation in the 21st century will be vastly more complex and demanding than in the second half of the 20th century" so said, Jonathan Howe, Former Director General, ACI. Training the men and women who work in civil Aviation is key to meeting the unprecedented challenges. Focus of training is generally placed on the executives. While, it can continue, a lot more training will need to be given to the grass root level staff.

Airport/airline management would need to take the initiative to train and retrain all their staff and executives. Managers whether in airlines, airports, air navigation services, air traffic controllers or fire and rescue services or any other field of civil aviation will need to expand their

knowledge level and expertise if they are to achieve a dynamic balance between profitability and safety goals.

A complex situation, perhaps somewhat unique is the safety standards in civil aviation which is one of the best in the world. At the same time, aviation executives have to produce necessary profit for the industry. Aviation business is unique and it will continue to enjoy the monopoly despite change of management structure. The aviation operators will continue to wear the double cap of a regulator and a service provider while retaining commercial principles.

Human Factors in Civil Aviation

With a growing social intolerance of accidents of all kinds, the millennium will see greater emphasis on understanding the role of human factors in the safe operation of aircraft, airport, focusing just not on flying and maintenance functions, but on all support roles. The reality is that human error is documented as the primary contributor to several accidents/incidents[9].It means that human factors are taking a higher profile – it involves a deeper understanding of people's skills and a whole range of characteristics as applied to machines, specific job or whole systems, to ensure operations are safe and effective. This then get applied to everything from design and manufacture of equipment to the management of operations and development of policies, training and procedures. ICAO continuously emphasis on this aspect of 'human factor' and has updated a range of Annexes and procedural guidelines covering a range of areas with the creation of a package of Standards and Recommended Practices (SARPs) relating to the role of human factors in the operational environment.

The objective of aviation Human Factors is to address human error in operational environments. The Human Factors principles apply to aeronautical designs, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance. The contribution of technology to aviation safety and efficiency is undeniable. However, despite its positive effects, both from a safety and economic point of view, incidents and accidents continue to show that new and sometimes surprising problems still exist. Two reasons explain these problems. Firstly, the absence of an approach to the implementation technology which includes Human factors considerations as an integral part. Technological and Human Factors solutions have frequently been implemented autonomously, with little dialogue between system designers and Human Factors practitioners. Therefore, technology has not fully delivered its potential because of deficiencies in its interface with human operators. This technology centered automation is being gradually phased-out in favour of ICAO supported 'human centered' automation[11]. In this, human capabilities and limitations are fully taken into account and integrated with technology during system and procedures design. Secondly, if Human Factors knowledge is not pro-actively integrated during system design, it will most likely be applied in a reactive mode, after investigations of accidents and incidents document flaws in human performance, which may be either due to inherent human limitations fostered by deficient human – technology interfaces, or more likely, by a combination of both. Reactive approaches tend to focus on immediate rather than on root causes of problems because of the emotional context within which they take place.

Automation of tasks through the introduction of technology is an attempt to increase the production of a system by replacing human functioning by machine functioning, while maintaining or enhancing existing levels of safety. Aviation is not alone in its objective for increased production through automation, and similar endeavors have been attempted in other industries. Nonetheless, aviation as well as other industries has watched how huge investments in automation, which during its design stage appeared sound and appropriate to meet these objectives, did not deliver as expected when interfaced with daily operations. Automaton design without due consideration to human factor issues carries serious implications. The implication is clear – automation design should be context - conscious and human – centered from its inception. Furthermore, the role of automation in fostering human error has often been overlooked. Involving human factors expertise during technology design might occur additional expenses, but the costs are paid once in the system's lifetime. On the opposite side, coping with flawed human technology interfaces through training means incurring additional expenses throughout the entire operational life of the system.

Historically, human factors issues in aviation have been dealt with in a reactive manner, now, the pro-active management of Human factors issues should be a normal component of the process followed by designers, providers and users of those systems. The time to address human Factors issues is during technology design, before technology is deployed into operational contexts. This will help to anticipate negative consequences of human error rather than regret its consequences. Technology and human performance (human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations) must be considered as a joint human – machine system. Designing technology without consideration of human factors/Human errors will yield compromises rather than optimum benefits. So, select the right training schedule and give the right training to your employees and make them competent to take the right decision at the right time. Your airport is then rightly placed to move ahead.

Each of you may by now have different views on air transport management and what matters is your view on airport /airline management as airport /airline managers.

Let your view be that the air transport management is all about mastering the Airport Access, Customer Access and Commercialize to maximize revenues while remaining safe, customer and eco-friendly and hold that conviction till you achieve Excellence.

Performance + Productivity are the outcome and is the shortest access to Excellence. Excellence is related to pursuit of total quality backed by the employee's capacity for innovation and delivery, and setting standards and reviewing them through control measures ensures success.

GROUND HANDLING MANAGEMENT

Aircraft Ground Handling

In aviation, aircraft Ground Handling defines the servicing of an aircraft while it is on the ground and (usually) parked at a terminal gate of an airport.

Many airlines sub-contract ground handling to an airport or a handling agent, or even to another airline. Ground handling addresses the many service requirements of a passenger, freighter or Combi aircraft between the time it arrives at a terminal gate and the time it departs on its next flight. Speed, efficiency, and accuracy are important in ground handling services in order to minimize the turnaround time (the time during which the aircraft must remain parked at the gate). Airlines with less-frequent service or fewer resources at a particular location sometimes subcontract ground handling or on-call aircraft maintenance to another airline, as it is a short-term cheaper alternative to setting up its own ground handling or maintenance capabilities. The major categories of ground handling services are described below:

Passenger Services	**Other Services**	**Management Duties**
Arrival service	Cargo and mail services	Training
Check-in service	Central departure control	Ramp Services
Gate service	Consulting services	Baggage handling
Irregularity services	Crew services	Interior cleaning
Lost and found	Financial services	Cooling/heating
Lounge services	Flight Deck Operations	De-icing/anti-icing
Security and VIP service	Manual development	Load control and Loading/unloading
Transfer service	Medical services	Marshalling
	Ships library	Moving of aircraft
	Surface transportation	Parking
	Systems development	Pre-departure inspections
	Ticket sales	Ramp fueling/De-fueling operations
		Ramp to flight deck communications
		Safety measures

		Sealing of aircraft
		Starting up
		Transfer service
		Water & waste
		Purchasing services
		Station management
		Supervision and Station Inspection

MANAGEMENT OF AIRLINE CREW MEMBERS

Managing ever changing human behavior of customers is part and parcel of effective business management. Besides this, managing internal employee satisfaction and motivation is the key to employee retention, sector optimization and prompt service delivery. The ever growing air traffic volume and pursuit to ensure everlasting travel experience for customers has pushed airlines towards an effective utilization of resources. Crew has always been an important part of travel services as they are the face of the carrier towards making a good travel experience.

Effective crew utilization has always been a challenge for airlines whether it is equipment training, qualification, and experience versus the various round the clock flights planning exercises. Crew resource management or cockpit resource management (CRM) is a set of training procedures for use in environments where human error can have devastating effects. Used primarily for improving air safety, CRM focuses on interpersonal communication, leadership, and decision making in the cockpit.

The term "cockpit resource management" (later generalized to "crew resource management") was coined in 1979 by NASA psychologist John Lauber who had studied communication processes in cockpits for several years. While retaining a command hierarchy, the concept was intended to foster a less authoritarian cockpit culture, where co-pilots were encouraged to question captains if they observed them making mistakes.

CRM grew out of an analysis by the US National Transportation Safety Board (NTSB) of the 1978 United Airlines Flight 173 crash where the plane ran out of fuel while the flight crew were troubleshooting a landing gear problem. The NTSB issued its landmark recommendation to require CRM training for airline crews on June 7, 1979. A few weeks later, NASA held a workshop on the topic, endorsing this innovative training. United Airlines was the first airline to provide CRM training for its cockpit crews in 1981. By the 1990s, it had become a global standard.

United Airlines additionally trained their flight attendants to use CRM in conjunction with the pilots to provide another layer of enhanced communication and teamwork. Studies have shown that by both work groups using CRM together, communication barriers are reduced and problems can be solved more efficiently, leading to increased safety. CRM training concepts have been modified for application to a wide range of activities where people must make dangerous time-critical decisions. These arenas include air traffic control, ship handling, firefighting, and medical operating rooms.

CRM aviation training has gone by several names, including cockpit resource management, flight deck resource management, and command, leadership, and resource management, but the current generic term, crew resource management, was widely adopted. When CRM techniques are applied to other arenas, they are sometimes given unique labels, such as maintenance resource management or maritime resource management.

CRM training encompasses a wide range of knowledge, skills, and attitudes including communications, situational awareness, problem solving, decision making, and teamwork; together with all the attendant sub-disciplines which each of these areas entails. CRM can be defined as a management system which makes optimum use of all available resources—equipment, procedures and people—to promote safety and enhance the efficiency of operations.

CRM is concerned with the cognitive and interpersonal skills needed to manage resources within an organized system, not so much with the technical knowledge and skills required to operate equipment. In this context, cognitive skills are defined as the mental processes used for gaining and maintaining situational awareness, for solving problems and for making decisions. Interpersonal skills are regarded as communications and a range of behavioral activities associated with teamwork. In many operational systems as in other walks of life, skill areas often overlap with each other, and they also overlap with the required technical skills. Furthermore, they are not confined to multi-crew craft or equipment, but also relate to single operator equipment or craft as they invariably need to interface with other craft or equipment and various other support agencies in order to complete a mission successfully.

CRM training for crew has been introduced and developed by aviation organizations including major airlines and military aviation worldwide. CRM training is now a mandated requirement for commercial pilots working under most regulatory bodies worldwide, including the FAA (U.S.) and JAA (Europe). Following the lead of the commercial airline industry, the U.S. Department of Defense began formally training its air crews in CRM in the mid 1980s. Presently, the U.S. Air Force and U.S. Navy require all air crew members to receive annual CRM training, in an effort to reduce human-error caused mishaps. The U.S. Army has its own version of CRM called Aircrew Coordination Training Enhanced (ACT-E).

Communication

CRM aims to foster a climate or culture where the freedom to respectfully question authority is encouraged. However, the primary goal of CRM is enhanced situational awareness, self awareness, leadership, assertiveness, decision making, flexibility, adaptability, event and mission analysis, and communication. It recognizes that a discrepancy between what is happening and

what should be happening is often the first indicator that an error is occurring. This is a delicate subject for many organizations, especially ones with traditional hierarchies, so appropriate communication techniques must be taught to supervisors and their subordinates, so that supervisors understand that the questioning of authority need not be threatening, and subordinates understand the correct way to question orders.

Cockpit voice recordings of various air disasters tragically reveal first officers and flight engineers attempting to bring critical information to the captain's attention in an indirect and ineffective way. By the time the captain understood what was being said, it was too late to avert the disaster. A CRM expert named Todd Bishop developed a five-step assertive statement process that encompasses inquiry and advocacy steps:[13]

- **Opening or attention getter** - Address the individual. "Hey Chief," or "Captain Smith," or "Bob," or however the name or title that will get the person's attention.
- **State your concern** - Express your analysis of the situation in a direct manner while owning your emotions about it. "I'm concerned that we may not have enough fuel to fly around this storm system," or "I'm worried that the roof might collapse."
- **State the problem as you see it** - "We're showing only 40 minutes of fuel left," or "This building has a lightweight steel truss roof, and we may have fire extension into the roof structure."
- **State a solution** - "Let's divert to another airport and refuel," or "I think we should pull some tiles and take a look with the thermal imaging camera before we commit crews inside."
- **Obtain agreement (or buy-in)** - "Does that sound good to you, Captain?"

These are often difficult skills to master, as they may require significant changes in personal habits, interpersonal dynamics, and organizational culture.

FATIGUE RISK MANAGEMENT SYSTEMS

ICAO has defined FRMS as a “scientifically based, data driven, addition/alternative to prescriptive flight and duty time limitations which manages crew fatigue in a flexible manner appropriate to the level of risk exposure and the nature of the operation” (ICAO, 2008).

Essentially, through an integrated set of management policies, procedures and practices, it moves away from the traditional, scientifically doubtful, hours of work limits as a means of controlling fatigue in the work place and takes a much broader, holistic perspective of the causes of fatigue on duty with respect to organizational, environmental, physiological and other factors.

FRMS principles should prevail from roster design through all stages to crew rest and recovery. The philosophy recognizes that different influences will affect levels of fatigue on otherwise similar duties and that a “one size fits all” prescriptive hours limitation scheme cannot effectively regulate for this. In an FRMS every duty will have its own bespoke hours limitations formulated through a process of multi faceted monitoring and reporting, evaluation, timely modification of limits and procedures, and integral, systematic feedback loop for continuous fatigue risk

assessment for that particular operation. It is a performance outcome driven system relying on a "just" culture reporting, intended to be as much proactive as it is reactive.

FRMS is a risk management function which is allied to and designed to be an integral part of an organization's SMS. Akin to SMS, FRMS requires the implementation of multiple defences against fatigue at various organizational levels according to James Reason's "Swiss cheese" model.

A major element of an FRMS is the identification of fatigue hazard, evaluation of its severity and likelihood of occurring, assessment of the risk that it posses and implementation of mitigating risk reduction measures.

An important concept of FRMS is shared ownership. Figure 8 represents how consultation and communication among all involved parties influences and shapes the principle functions of the system in a dynamic process of continual development.

Human Factors Perspective

Improved understanding of fatigue risk hazards has lead to the realization that all stakeholders (regulators, employers, employees) share responsibility for minimizing risk and increasing the safety of the operation. In the past human error, considered the primary cause of accidents and incidents, had been associated with operations personnel (pilots, engineers, dispatchers, controllers etc.). Analysis of recent major accidents in aviation and other industries has revealed that managerial decision making failures, primarily related to latent risk embedded in an organization's procedures or structure, have also been a contributory factor. Table 5 illustrates how this new thinking translates into the allocation of FRMS responsibilities.

The integrity of this system relies upon an open, honest and non-punitive reporting culture, appropriate regulatory oversight and confidence that an organization's management will not be tempted to abuse the FRMS process for commercial advantage and similarly that employees do not overstate fatigue issues for lighter work schedules. Ideally this moves the fatigue management process out of the labour/management negotiation regime into the domain of safety management where lifestyle issues are respected and where all operational, ancillary and directing staff have a stake and are able to contribute to the process.

System Description

The following presents components parts of an FRMS under 6 headings which are closely aligned with the ICAO draft proposals. These headings with their associated elements are as follows:

- Policies and Procedures
  - Outline the commitment of organizational management to manage fatigue-related risk
  - Detail the required procedures for managing fatigue at the operational level

- Responsibilities
  - List personnel responsible for FRMS design, implementation and maintenance
  - Document responsibilities of individual employees and work groups

- Risk Assessment/Management
  - Scheduled versus actual hours of work
  - Individual sleep patterns
  - Symptom checklists
  - Error/incident reporting

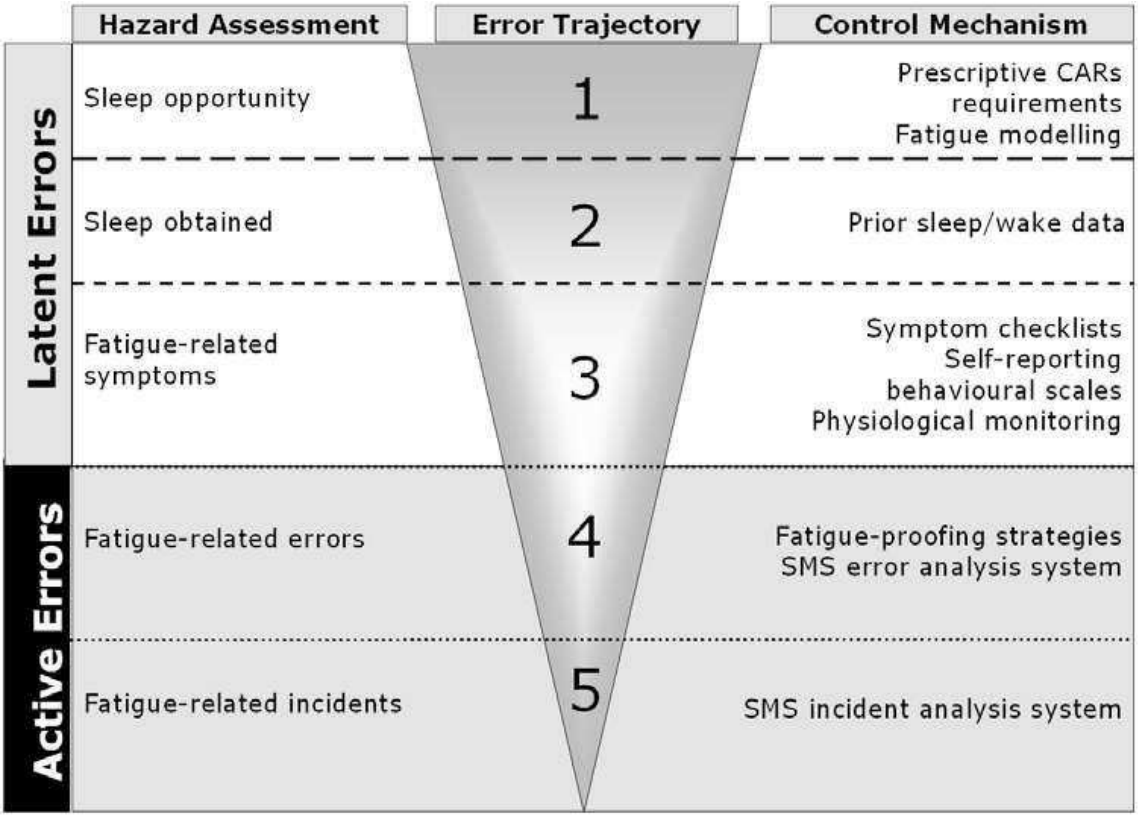
- Training
  - Promote knowledge in the workplace about risks, causes and consequences of fatigue
  - Ensure employees understand and can apply FMRS strategies

- Controls and Action Plans
  - Toolbox of methods used within FRMS, including error reduction techniques ("fatigue proofing" rather than "fatigue reduction")

    - Clear decision trees for managers and employees to use when fatigue has been identified as a risk
- Audit and Review
    - Documentation and data collection at regular intervals monitoring how FRMS is working
    - Review of FRMS based on audit results

This format replicates the typical structure of an airline's SMS allowing an FRMS to be superimposed as an extra safety related dimension onto the functioning of an already operating organizational system and thereby facilitating its introduction, reducing duplication of effort and benefiting from a common human factors philosophy of a "just safety culture" and shared system ownership and responsibilities.

ICAO 5 defensive layers (or levels of control in managing fatigue risk) against an error trajectory analogous to Reason's "Swiss cheese" model which are:



By comparison, FTL schemes just have the one defensive layer, that of duty hours limitation.

Overseeing and acting as a focal point for all the FRMS processes in an organisation is the Fatigue Management Steering Committee (FMSC). The FSF lists the functions of this body as follows:

- monitoring fatigue information sources;
- investigating fatigue-related issues;

- requesting internal audit of specific issues;
- proposing solutions to fatigue related issues;
- recommending priorities for targeting fatigue management resources;
- providing transparent and timely feedback to management and workforce;
- cooperating with internal and external audits; and,
- overseeing the quality assurance of FRMS training in whole organisation.

It goes on to recommend that this group is made up of representatives drawn from:

- pilots and cabin crew
- medical staff
- establishment planners/rostering staff
- commercial/marketing departments
- training establishment
- engineering
- safety services
- flight operations,
- achieving a balance of company and employee staff with access to scientific/specialist advice as required

The organisational structure of an FRMS is represented in Figure 10.

Figure 10: An FRMS Organizational Chart

Risk Assessment/Management

Fatigue risk is difficult to predict and quantify with any accuracy within a risk management system. Indeed the relationship of fatigue and risk is non linear and poorly understood. However

the Functional Resonance Accident Model (FRAM) of risk suggests that increased fatigue does lead to increased risk and this is an assumption common to both FRMS and FTL schemes.

With FTL schemes the risk assessment and management has been a predominantly reactive process, adopting a compromise between best practice and commercial imperative. In a FRMS this process is a central function which binds the system together using reactive and proactive components. The reactive part comprises "risk radar" that senses fatigue hazard via 4 layers of reporting chains:

- Routine reports; i.e. Flight Data Monitoring (FDM), Flight Reports, Roster Stability Data, Sickness Rates, Aviation Medical Examiners' Reports, etc.,
- Ad hoc reports; i.e. FRMS Audits, Crew Surveys, Safety Walks, Line Orientated Safety Audits (LOSA), Flight Operations Quality Assurance (FOQA), etc.,
- Incident (Accident)/Risk driven reports; i.e. Air Safety Reports (ASRs), CHIRP, Fatigue Incident Report Forms, Crew Welfare Report Forms, Fatigue Investigations, Discretion Reports, etc.,
- Long term fatigue studies; i.e. Human Factors Monitoring Programmes (HFMP), Human Interaction in the Lifecycle of Aviation Systems (HILAS) project, etc.

Far greater and immediate relevance is given to these sources of information than is the case with FTL schemes. The data is processed in relation to a series of functions that investigate, analyze, assess and rate according to the context of the operation. This establishes a defined risk for the reported hazard and, if the metrics of the risk exceed a set threshold, this leads to a process of operational change and risk mitigation, the level of which is dictated by the severity of the risk. The system is, therefore, procedurally and dynamically adapted to mitigate fatigue risk.

The output of this process can be either immediate, tactical modifications to, say, a specific trip rotation or long-term strategic changes to, for example, rostering policy, both of which are informed by organizational learning processes and/or feedback loops.

Figure 11 is a diagrammatic representation of the risk management process promoted by International Risk Management Standard 4360 (AS/NZS, 2004).

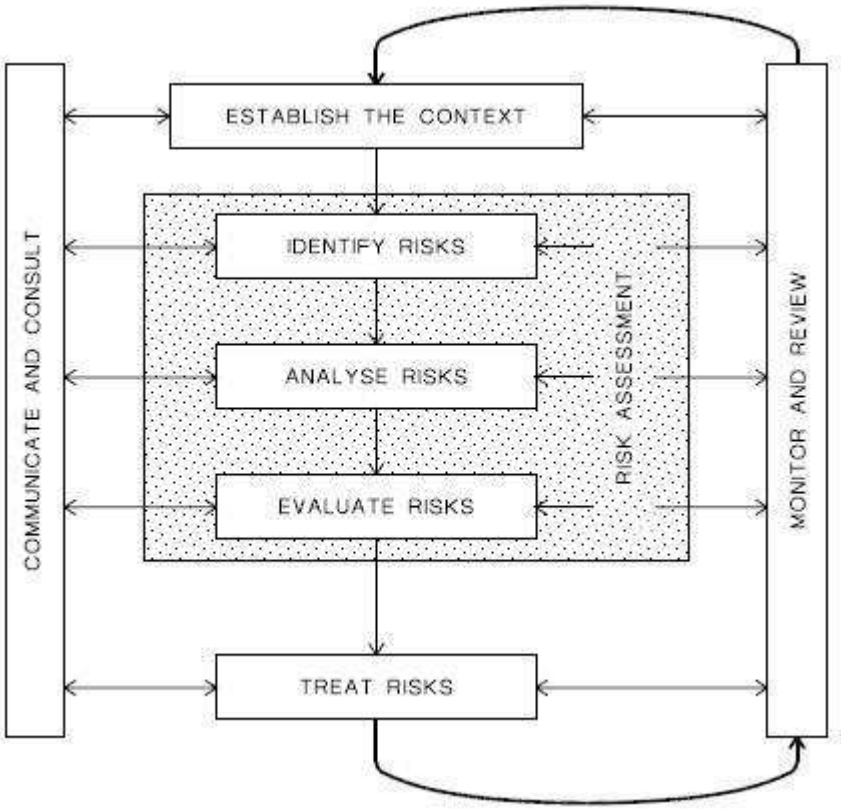


Figure 11. The Risk Management Process

The complexity of modern day air transport operations and higher expectations of safety demands a system with a greater proactive emphasis. This can be provided by computer fatigue modelling programmes that can predict generic fatigue levels at any point of an FDP and can be instrumental in the assessment of the fatigue risk associated with new trip patterns. This, then, can influence the risk management process resulting in the deployment of proactive fatigue risk mitigating measures.

Physiological Monitoring and Alertness Testing

Fatigue studies have employed a range of methods to collect data about flight crew's quality of sleep, susceptibility for sleep (multiple sleep latency tests - MSLT) and state of alertness. In controlled scientific studies polysomnography monitoring, which uses electroencephalograms (EEG), electrooculograms (EOG) and electromyograms (EMG) to record brain activity, eye movement and chin muscles tension respectively, has been used to assess the structure of sleep following disturbed rest associated with shift work or time zone change. In other scientific tests measures have included; the readings of individual's body temperature (using Biorhythm watches) and salivary melatonin to establish phase of the internal body clock and rate of adaptation to new time zones, the wearing of Actilumes and Actiwatches (watch like devices that detect light and movement respectively) to record when sleep was likely to have occurred, and Psychomotor Vigilance Task (PVT) and Palm Pilot computer alertness tests. To compliment

these objective tests, subjective assessment has usually been conducted in tandem for comparison and validation purposes and these have taken the form of sleep diaries and alertness report forms.

Computer Fatigue Modelling

The principle method for proactively predicting fatigue levels associated with proposed duties and therefore a key component of an FRMS is the computer fatigue modelling programme. There are several programmes in widespread use today, not just in the aviation industry, such as the UK Health and Safety Executive's Fatigue and Risk Index Calculator, the NASA – TLX (Task Load Index), the USAF's FAST (Fatigue Avoidance Scheduling Tool) and the FAID (Fatigue Audit Inter Dyne) risk management tool used by easy Jet for their FRMS.

The programme most appropriate for assessing the fatigue generated by the long duty hours, irregular patterns of work and rest, and time zone shifts common place in long-haul rosters is the UK's QinetiQ developed SAFE.

Data entry for SAFE includes information about crew composition, in-flight rest and time zone transition as well as schedule, duty time and sectors operated. Computed analysis output takes several forms listed as follows:

- Workload and Alertness Summary; indicating problem areas/transgressions within a particular duty;
- Cumulative Workload; successive duty workload comparison with Nicholson Curve; (as explained in Section 4.1);
- Body Clock Desynchronisation;
- Duty Hours;
- Blood Alcohol Concentration;
- Equivalent Alertness Scales; including Samn-Perelli Seven-point Scale and Karolinska Sleepiness Scale,
- Estimated Sleep Period; prediction of time when sleep may be achieved.

FRMS in Operation: International Practices

The first application of an FRMS philosophy to an aviation environment was in 1995 when the CAA of New Zealand (CAANZ) introduced an "alternative compliance scheme" to their existing FTL scheme. Following on from this the Australian Civil Aviation Safety Authority (CASA) began trialling FRMS in 2001. Both of these initiatives were prompted by the geographical remoteness of these 2 countries and particular demands on their aviation industry leading to a realization by the NAAs that the conventional FTL schemes in place were not sufficiently broad enough in their scope to regulate all aviation activities.

With the arrival of the Airbus A340-500 extended range aircraft airlines were able to introduce scheduled ULR services of 16 hours and over. In 2004 Singapore Airlines (SIA) started services

from Changi to Los Angeles and New York whilst Emirates began flying directly to Sydney and New York from Dubai. These operations could not be catered for within these organization's normal FTLs so special, dedicated ULR procedures were devised for these flights based on FRMS principles which are now a universally accepted reference for long-haul FRMS operations.

Elsewhere, in the intensive, short haul environment of the low cost carrier, easyJet found that the roster routine allowed by their existing FTL scheme was contributing to undesirable levels of fatigue risk and incidences of flight deck errors. After conducting a trail of an FRMS designed roster, easyJet was able to present to the regulator, a safety case for alleviation from their FTLs by virtue of employing FRMS techniques which ensured an equivalent or better level of safety. This was accepted and easyJet rolled out their FRMS programme in April 2005. Also in Europe, to date, Jetairfly (TUI) and DHL Air have begun development of their own FRMS systems.

Introduction of FRMs into Long Haul Operations

Regulatory Background

The International Civil Aviation Organisation (ICAO) sets out in its Standards and Recommended Practices (SARP) document guidance for aviation authorities to follow in formulating regulations. In the draft Annex 6, Part I of the SARP proposed for issue in 2011, ICAO recommends that:

> *"Operators shall establish flight time and duty period limitations and a rest scheme….. to manage fatigue."* and that these *"Shall be based upon scientific principles and knowledge where available…".*
>
> (CAA, 2009c)

In response to this ICAO guidance EASA have signaled in a notice of proposed amendment to EU.OPS proposed to be mandated in April 2012 (postponed from October 2010), when EASA takes control of FTL regulation, that OR.OPS.025.FTL will state:

> *"An operator shall establish and maintain an FRMS as an integral part of its management system."* that *"shall correspond to the roster system or flight time specification scheme used by the operator…"* and that the *"Operator shall take mitigating safety measures when the FRMS process shows that the required safety performance is not maintained."*
>
> (EASA, 2009)

Safety Case

The purpose of the safety case exercise is to verify the need for FRMS incorporation, collect a baseline of fatigue risk data as a pre-FRMS implementation reference, establish and refine the process for risk assessment and management, trial "levers" for fatigue risk mitigation (to prove the system and effectiveness of "levers") and gain regulator approval.

The 2 trip rotations indicated by the VAA pilot fatigue survey to be the most fatiguing should be the primary focus for an FRMS safety case i.e. for the Airbus fleet, the LHR-HKG-SYD pattern and for the Boeing fleet, the LHR-LGW-MCO pattern.

A comprehensive HFMP should be planned for at least 6 months to account for seasonal changes in length of daylight and effects of weather. A campaign of objective testing using Actiwatches and carrying out PVT and Palm Pilot alertness tests together with subjective data achieved through sleep diaries and fatigue report forms, completed at specified points, should be conducted.

The performance outcome of these surveyed trips could be analysed through assessment of the various sources of data, listed in section 6.2.1, and already collated by the SMS, filtered for those reported outcomes, the occurrences of which, pilots had some influence over. By emulating easyJets methodology (Appendix E), it should be possible to establish a linkage between rostering practice and given working environment, measured flight crew alertness (and by inference, fatigue) and the performance/safety outcome.

SAFE, tuned to the particular operating characteristics of the airline, validated by the HFMP, areas of fatigue risk could be predicted and a proactive risk assessment/management function could be employed for these safety case trips and applied in future to all trips in the airline's route structure. FRMS strategies deployed by SIA for their ULR operations could be trialled to gauge their effectiveness and reinforce the case for regulator approval.

Organizational "levers" to mitigate fatigue risk could be manipulations of the schedule by changing departure times, or roster pattern by varying layover and recovery times, or crewing establishment by increasing crew compliments. Further measures might include studies into the best arrangement for crew in-flight rest and the effects of cumulative fatigue built up over a series of rotations.

FRMS Integration into Airline SMS

Organisational establishment changes to accommodate FRMS can be minimised as the FRMS Organisational Chart, depicted in Figure 10, can overlay the SMS structure. The "just culture", holistic, shared ownership and safety performance driven features are closely mirrored in both the related systems which compliment each other's purpose. Table 9 demonstrates how the essential elements of FRMS are related to the 10 organizational functions of SMS identified by ICAO.

ICAO's 10 Steps to SMS	Essential FRMS Elements
1. Planning	- Non-punitive Fatigue Risk Management Policy - "Just Culture"
2. Senior Management Commitment	
3. Organisation	- Fatigue Management Steering Group
4. Hazard Identification	- Fatigue Risk Assessment Tools - Crew Fatigue Reporting - Employee Communication Channels for Feedback

5. Risk Management	- Strategic, Scientifically-Driven Crew Scheduling - Validated, Timely Fatigue Mitigation Strategies -Data driven processes for monitoring alertness
6. Investigation Capability	- Procedures to Investigate and Record Fatigue-Related Incidents
7. Safety Analysis Capability	- Data Collection & Assessment
8. Safety Promotion & Training	- Education and Awareness Training Programmes
9. Safety Management Documentation	- Documented SOPs for FRMS Implementation
10.Oversight and Performance Monitoring	- Operator Internal Audit Programme - FRMS Validation Programme - Safety Performance Measurement

System Ownership A core principle of FRMS philosophy is system ownership. All operational stakeholders have a part to play in and are responsible and accountable for FRM Simplementation, operation, equitable administration, maintenance and improvement of the system.

Education and Training

Compelling, comprehensive, coherent and credible education will be the key to the success of introducing FRMS into an airline SMS. The ideas of shared ownership, "just culture", and collaborative and proactive safety management, central pillars of the FRMS philosophy must be accepted into the lexicon of the corporate culture for the theory to transform into efficient and productive practice.

For such a cultural shift in fatigue management thinking, from prescriptive hours of work limitations to safety/performance outcome influenced limits, and very much dependent on company personnel active acceptance, the education process needs to take place right at the beginning of the change management phase reaching as many people in the airline as possible, from top management down. The topics should cover:

- FRMS theory;
- Legal (Corporate) and Regulatory (NAA) requirement;
- Human Factors justification;
- Company FRMS Policy;
- Company Risk Assessment/Management Process;
- Company FRMS Organizational Structure;
- Individual FRMS Responsibilities
- FRMS Implementation Plan and
- Benefits of FRMS adoption.

After the FRMS education campaign has completed, then training of all staff associated with flight operations should begin based on the curricula that the FSF recommended for SIA ULR operations i.e.:

- Causes of fatigue in the airline environment
- Consequences of fatigue on aviation safety;
- Requirement for confidential feedback from incidents;
- Recognition of signs of fatigue and decreased alertness in self and others;
- Physiology of sleep and understanding of one's own sleep physiology and how it should influence preferential bidding;
- Circadian rhythms and homeostatic process;
- Sleep and alertness strategies including "sleep hygiene";
- Diet and hydration including effects of alcohol and caffeine;
- Prescription and non-prescription medication and rules;
- In-flight environment and its effects;
- Work scheduling and,
- Crew coordination to address sleep inertia after in-flight rest.

Risk Assessment/Management

The complexity of a long-haul operation with world wide destinations, round the clock activity, and a variety of trip and layover lengths requires a modified risk assessment/management process to that explained earlier.

By comparing the analyzed output of the "risk radar" element of the reactive component of the process with predicted fatigue levels from the SAFE programme, the proactive component, a relationship can be established between safety of the operation in terms of reported fatigue risk events and expected fatigue. This relationship, which may be unique to each rotation, can be used to aid trip planning with respect to schedule timings, number of pilots, length of layover etc.

The starting point for this process would be a defined level of safety stipulated by the regulator as an acceptable rate of fatigue risk event reporting which would correspond (via the relationship) to a limit on the decrement to SAFE predicted alertness. This limit would then inform the trip design process, using SAFE, and continue to be a dynamic, systematic fatigue risk governing function. True to FRMS principles, safety performance outcome would drive the process. The transparency of the process could be ensured by publishing the latest alertness level limits calculated for each trip. By making the SAFE programme available to pilots it could be verified that predicted alertness levels for a prospective trip rotation did not diminish below the limit promulgated. In setting the limit, factors could be introduced to allow for individual physiological differences in tolerances to fatigue and for variations in fatigue inducing aspects of the operation such as coping with weather and technical problems. Delays and diversions would necessitate a fresh SAFE evaluation with the facility to specify a cut off time for creeping delays.

FRMS system ownership would be satisfied by pilots' ability to directly monitor and influence, by tactical fatigue risk mitigating measures, the risk assessment/management process. The process's working metrics would meet the data needs of the regulator/operator for auditing/oversight requirements.

Company FRMS Policy

As a FRMS is a closely integrated feature of a company's SMS much of the documentary requirements of both systems will be common and therefore a degree of FRMS policy can be referenced to the SMS policy manual. Features that FRMS policy must define are:

- The level of senior management commitment;
- Responsibilities and accountability of the accountable executive, managers, committees, and employees;
- The purpose and goals of the FRMS;
- How the organisation will achieve its safety objectives;
- Resources allocated to FRMS
- The responsibility of all employees to manage fatigue risk;
- Fatigue related safety outcomes expected of managers, employees and contractors;
- Training requirements;
- Reporting procedures for fatigue related hazards;
- The fatigue reporting policy ("just culture");
- A procedure for evaluation and continuous improvement of the FRMS.

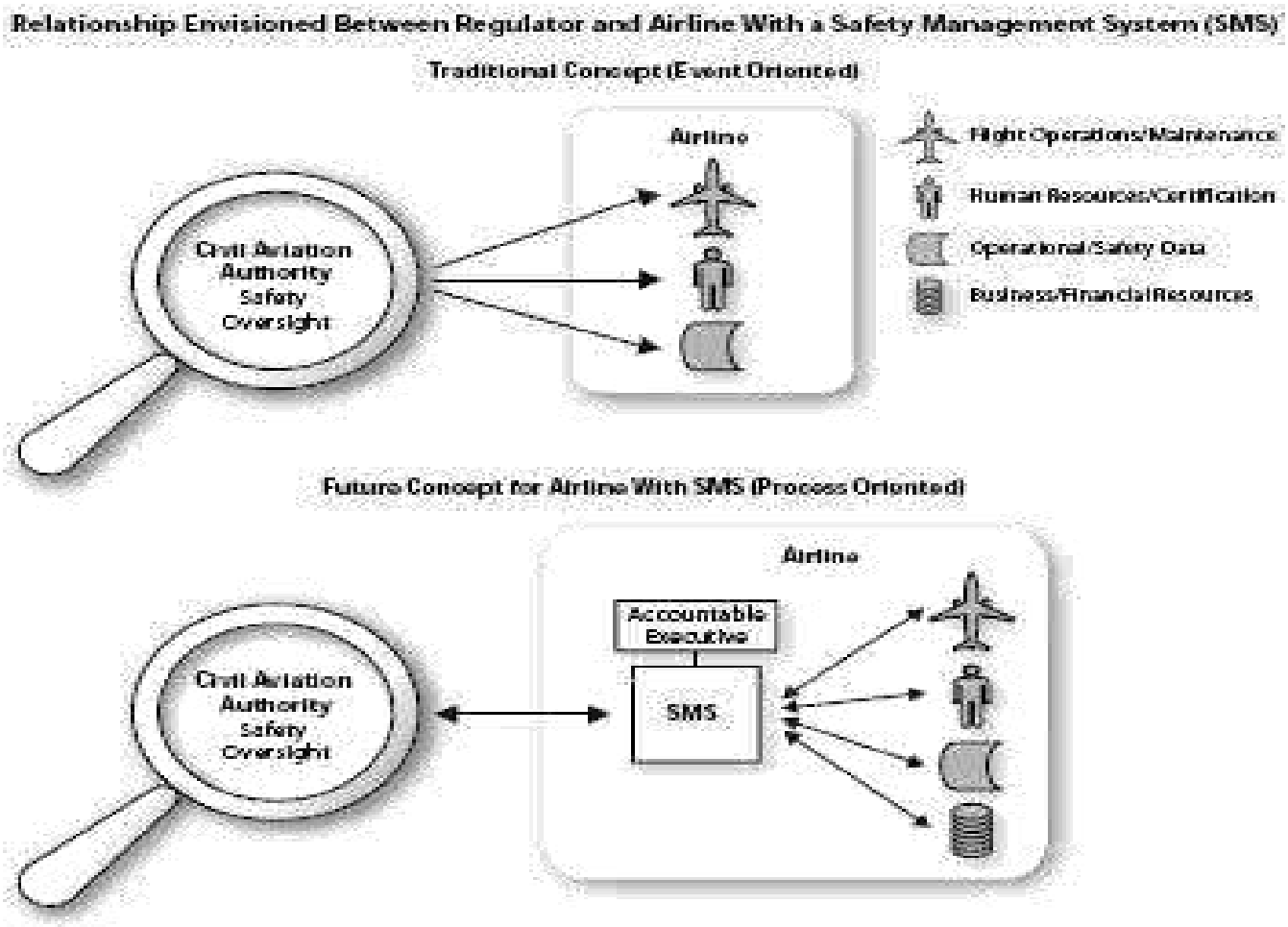
Regulator Oversight

It is anticipated that FRMS implementation into a long-haul operation will be a stepped process on a trip by trip basis. Many of the oversight requirements of the prescriptive FTL scheme will remain as FRMS is initially operated as an enhancement to the present scheme of fatigue management. Regulator supervision of company SMS will include functions of the FRMS.

The metrics of the risk assessment/management process output will facilitate the regulator's auditing task. However, to gain company wide confidence and acceptance of the new fatigue management system, to ensure that poor or incorrect practices do not become entrenched and enshrined in company procedure a strict regulator oversight commitment will be required in the early stages of implementation. Moreover, as every airline's FRMS will be different, tailored to their particular operating circumstances, the regulator will have to learn and understand each organization's system in order to validate and monitor it. Bench marking and establishment of safety goals will be needed by which the system can be assessed. The robustness of the system and company's management ability to oversee the correct functioning of the programme will be the major issues to be considered.

The oversight task will be demanding and, indeed, involve a change management process requiring new organizational structures for the regulator as well.

Once the FRMS/SMS are established the relationship envisaged between regulator and airline is illustrated by the diagram in Figure 17.



Pros and Cons of FRMS Adoption

Some of the advantages and disadvantages listed by a 2004 Australian Government discussion paper particularly applicable to a long-haul operation are:

Advantages;

- Improved flexibility with operation not restricted by sometimes inappropriate prescriptive FTLs;
- Increased safety through better awareness and understanding of fatigue;
- Improved rostering efficiency through deployment of more capable rostering tools and procedures required for FRMS;
- Clearer sharing of responsibilities for fatigue management;
- Credible, scientific basis for fatigue management;
- System not polluted by industrial issues;
- FRMS closely aligns with corporate governance and duty of care legislation;
- Transparency, understanding and faith in method of operation; and
- Shared ownership, “a problem shared is a problem halved”.

Disadvantages;

- Resource hungry implementation costs for cash strapped business;
- Temptation to over rely on the sexy fatigue management software to the detriment of other FRMS components and strategies;
- Some fatigue management software can be cumbersome and difficult to apply;
- Potential for FRMS abuse by either management or employees;
- High establish workload, particularly in implementation phase.

AIRLINE SCHEDULE PLANNING AND DEVELOPMENT

CONCEPT OF SCHEDULE PLANNING

Airlines have evolved over the past 70 years from simple contract mail carriers into sophisticated businesses. The current airline environment is very competitive and dynamic. Maintaining consistent profitability requires that appropriate tradeoffs be made between the often competing objectives within planning, marketing and operations. Airlines have led other industries in the application of operations research and information technology to deal with these issues. The real-time solution of large-scale optimization models has played a significant role in shaping today's airline industry. This role will increase as the industry becomes more competitive and flight characteristics change due to the implementation of new technologies. Airline planning and scheduling represents an excellent example of the application of operations research and mathematical modeling to solve complex and real industry problems.

Planning and Marketing define an airline's products and determine how they will be sold. This is a continuous process which begins 5 or more years before a flight's departure and operates until the last passenger is boarded and the aircraft door is closed. This process can be viewed as a series of overlapping sequential steps that include scheduling, marketing and distribution. This process requires an exchange of data and feedback between scheduling, pricing and revenue management and distribution. In addition, other considerations such as crew resources, maintenance and engineering and ground services help define the boundaries by which the airline schedule must operate and be managed. Scheduling determines where and when the airline will fly. Schedules are built to maximize long-term profitability. The revenue and cost associated with each schedule are based on very different views of the same information. Although the schedule is composed of individual flight legs between two cities, the airline's product and revenues are based on passenger origin and destination (O&D) markets.

An O&D market is defined by a passenger's point of entry and exit from the airline system. The schedule is built to maximize its attractiveness to customers in a wide variety of O&D markets. The development of hub and spoke networks was based on providing maximum O&D coverage with a limited number of flight legs.

The costs of operating the schedule depend on the flight legs, which drive the number and type of aircraft used. The schedule must consider the cost and availability of cabin and flight deck crews, as well as the requirement that aircraft cycle through maintenance bases at regular intervals. As a result, the schedule also determines the location and size of ground facilities, and the number and location of crew and maintenance bases. Efficient schedules which match supply and demand are key to airline profitability.

Profitable solutions require anticipation of general market conditions: the costs of capital, fuel and labor, as well as the level and nature of competition. Airlines address many scheduling issues (assigning aircraft and crews to flights, routing aircraft to maintenance bases) with large-scale combinatorial optimization techniques. The scale of today's airlines makes this increasingly difficult. For example, large U.S. domestic carriers operate more than 3,000 flights per day with 600 or more aircraft and can include more than 300 cities, serving over 10,000 unique O&D markets.

Marketing determines what specific products will be offered for sale and how many of each will be sold. The two primary components of airline marketing are pricing and yield management. Since deregulation of the U.S. domestic airline industry, both have evolved into very complex processes. Prior to deregulation, individual airlines served specific market segments. Scheduled carriers served the business traveler while charter carriers served the leisure market. Scheduled carriers flew with relatively low load factors but remained reasonably profitable due to the limited competition created by government regulation.

Just prior to deregulation, the scheduled carriers started to offer additional products to the leisure market segment to help fill some of the empty seats. There were two problems with this approach. First, airline revenue would have been severely diluted if the existing customer base switched from full fare to discounts. Restrictions were introduced to make discounts unappealing to existing business travelers (advance purchase, saturday night stay). Second, some flights were already full and discount sales would displace late booking, high value traffic. The yield management process was introduced shortly after deregulation to anticipate where discount sales would and would not be profitable. From this simple beginning, the pricing and yield management process has become very complex and dynamic. Their combined role is to help airlines fine tune demand and sales to meet the capacity provided by the schedule. Today, a U.S. domestic carrier's schedule can consist of up to 4 million fares. These fares and restrictions are adjusted frequently to match demand to supply; 100,000 fare changes per day is typical. As a result, revenue management departments must keep up with these changes. Every day the number of reservations available for sale is reviewed and adjusted in order to maximize total revenues on all future flights. This is another very large-scale optimization process that involves solving a highly stochastic and nonlinear optimization model. Controlling reservation availability for all future flights at a large U.S. carrier can represent a problem with approximately 500 million decision variables.

Distribution is the process of taking the airline products and putting them on the shelf for sale. The store front for the airline industry is primarily central reservation systems (CRS) and global

distribution systems (GDS). A CRS allows an airline's reservation agents to book their own flights and fares. CRSs are relatively expensive to develop and maintain. Large airlines typically have their own CRS, while second and third tier carriers tend to rent space in another carrier's (often their competitor's)system. In the 1970s U.S. domestic carriers began to give travel agents access to their CRSs. This provided each airline with a method for selling products outside of the reservations office.

THE MISSION OF SCHEDULING

What is the mission of scheduling? It is as broad as the mission of the airline itself. An airline has the responsibility to provide adequate service to the cities it serves; an airline must also, of course, operate efficiently and economically. Therefore, in its scheduling practices, airline management must continually search for the balance between adequate service and economic strength for the company. Airline scheduling can be defined as the art of designing system wide flight patterns that provide optimum public service, in both quantity and quality, consistent with the financial health of the carrier.

The public service and economic aspects of scheduling must be balanced with other factors, including these:

1. Equipment maintenance. A separate maintenance-routing plan must be drawn up for each type of aircraft in the fleet. All routing plans must be coordinated to provide the best overall service. Maintenance of airplanes requires that certain stations be pro-vided with facilities and personnel for periodic mechanical checks. Concentration of maintenance at only a few stations is desirable, and it is likewise desirable to utilize fully the facilities provided by planning an even flow of maintenance work.

2. Crews. Assuming that all captains, first officers, flight engineers, and flight attendants have had adequate training on each type of airplane and over the routes to be flown, there are always considerations of utilization and working conditions. Certain crew routings must be followed to maintain efficient monthly utilization; crew routings that would require excessive flying without proper rest cannot be used.

3. Facilities. Gate space on airport ramps must be adequate. Terminal capacity, including ticket counters, baggage-handling areas, and waiting rooms, must be expanded to meet growing market requirements. Access roadways to and from airports must be adequate. Airport capacity, including runways, taxiways, and navigational aids, establishes an upper limit on operations.

4. Marketing factors. Marketing factors are numerous, including such characteristics as market size, trip length, time zones involved, and proximity of the airport to the market served.

5. Other factors. Seasonal variations in wind patterns require differences in summer and winter flying times on certain routes (usually east–west); however, some airlines use constant year-round flying times on routes where variations in wind components are negligible (usually north–south routes). In addition, on many segments, variable times are used to allow, to some extent, for anticipated delays during periods of heavy air traffic.

Scheduling is performed by top management collectively. There is a chief architect, to be sure—the scheduling department, headed by a vice-president or director, depending on the size or organizational makeup of the company. With the exception of some of the major carriers, which include scheduling as part of the corporate economic planning administration, most scheduling departments are under the marketing administration because of the overriding importance of service to the public. In developing a system flight pattern or schedule plot, as it is sometimes referred to, the scheduling department works closely with all other departments and with all field stations.

In addition to its own continuing review, the department continually receives suggestions and proposals from local-station personnel and the public. With knowledge of traffic volumes and patterns, numbers and types of aircraft on hand and to be delivered, maintenance requirements, operational factors, and scores of other considerations, the scheduling department, after weeks and often months of planning, develops a proposed system schedule. This is then submitted to all appropriate departments for study.

Many airlines use the committee system, in which officials from all operating departments meet to analyze the proposed schedule, make suggestions, and resolve conflicts between departments. Whether the committee system or some other method of interdepartmental coordination is employed, the result is the same: a schedule that meets the combined goals of public service, sales and competitive effectiveness, profitability, and operational dependability and efficiency.

EQUIPMENT MAINTENANCE

The primary purpose of the maintenance organization of an airline is, of course, to provide a safe, salable aircraft for every schedule. This would be simple if the carrier had an unlimited number of airplanes, unlimited facilities, and unlimited personnel—all located at every point on the system. But it does not, and so it must strive for a number of maintenance efficiency goals: (1) minimize aircraft out-of-service time, (2) use up time allowable on aircraft and parts between overhauls, (3) seek optimum utilization of personnel and even workload, and (4) maximize utilization of facilities. These goals do not affect safety, of course—safety can never be sacrificed to meet a schedule. You can see, however, the implications these goals have for the schedule planner. Let's examine them closely.

1. Out-of-service time. Because the profitability of an aircraft depends to a large extent on its daily utilization or availability, the carrier must do everything it can to design a maintenance system that provides a high standard of maintenance yet minimizes out-of-service time. If this can be done only at the expense of safety and dependability considerations, the airline must either reduce planned aircraft utilization to allow adequate maintenance or improve the product until it meets the goals.

2. Allowable time. The carrier should utilize the maximum time allowable in the various inspection and overhaul programs. This item represents a very large cost variable in an airline's operation. Again, however, this must be done with the first objective in mind—minimum out-of-service time.

3. Personnel and workload. In performing any inspection, repair, or overhaul, the carrier requires either FAA-licensed personnel or highly trained specialists—engineers, planners, inspectors, and a host of others. Because the overhaul base payroll for a major air carrier runs into millions of dollars each year, it is important to keep costs down if the carrier is to achieve maximum utilization of its people. An airline also must maintain an even work flow, because these specialists and technicians require a high degree of training and experience and are not readily available in the open labor market.

4. Use of facilities. The carrier must utilize facilities to the maximum extent possible, because of its substantial investment in buildings, tooling, and specialized equipment.

FLIGHT OPERATIONS AND CREW SCHEDULING

Because airline schedules, once published, must be flown by the company's flight crews, the flight-operations department must ensure that flights are scheduled in a fashion that will permit them to be safely and efficiently operated. The following operational factors are important in schedule planning:

- Airport runway lengths
- Aircraft fuel capacity
- Habitual adverse weather
- Air traffic control and routings
- Crew time limits
- Employee agreements

Obviously, airport runway lengths, aircraft fuel capacities, and so forth affect scheduling decisions. Other less obvious but equally important factors in drafting schedules include weather, aircraft routings, and flight crew scheduling.

In this sense, the term weather is used to describe the type of condition that occurs ordinarily at a specific locale during certain times of the day or seasons of the year. For example, in winter months, weather may make it inadvisable to overnight an aircraft in a particular northern city where hangar facilities are not available. Although overnighting might facilitate the operation of a desirable late-evening arrival and early-morning departure, the need to remove snow and ice from the aircraft after a storm might make such an operation impractical. Certain areas of the country, such as the Gulf Coast, do not lend themselves to dependable on-time or safe operations because of the likelihood of fog from shortly after midnight until sometime before noon. Often, flights scheduled during this period must be delayed or canceled or, if operated, restricted in load because of the excess fuel reserves required for safety.

A second operational factor concerns air traffic control (ATC). ATC routings often dictate longer flight times between two points than normal. In addition, certain flight segments are subjected to route closures and resultant time-consuming and costly diversion by military actions.

One of the most important and complex factors affecting flight operations is that of crew assignment to specific flights. The working limitations that govern flight crews are found in both the Federal Aviation Regulations (FAR) and employment agreements. The

FAR limits are as follows:

1. There is a daily limitation of 16 hours maximum flight duty time for pilots on a two-person crew, unless, prior to exceeding 16 hours, a rest period is provided of no less than 10 hours. Therefore, an increase of only a few minutes to a schedule, or the addition of one extra station, might force a crew break and layover not otherwise necessary. Duty time includes planned flight time, taxi time, known delays, and debrief time. After push back, the pilot must return to the gate if extended ground delays would cause duty to exceed 16 hours at the estimated release time.

2. Flight crew members must have had at least 8 hours of rest in any 24-hour period that includes a flight time.

3. Flight crews may not exceed a maximum of 40 flight hours during any seven consecutive days. Release from all duty for 24 hours must be granted to each flight crew member during any seven-consecutive-day period.

Employment contracts compound the difficulties. Most airline contracts provide that one hour of flight pay must be paid for every four hours a pilot spends away from the domicile. This time is frequently not flown; therefore, pilots are frequently paid for time not flown. These contracts also require that the airline bear the expense of training otherwise unneeded crews. And most airline agreements provide a maximum of 80 hours flight time during any month for their pilots.

An operations manager's dream is to be handed a schedule that permits all crews to operate flights on a direct turnaround basis with no layover problems or expense. This is manifestly not possible, but every attempt must be made in the interest of crew utilization and economy to minimize layovers. Average flight crew utilization for some of the major carriers with intricate route structures goes as low as 55 hours per crew member per month.

Seniority, labor's most valued asset, is management's biggest headache when it comes to training and assigning flight crews. The newer, faster planes generally are flown by the most senior crews, who earn the highest wages. Therefore, moving down through the ranks, the most junior captains and first and second officers fly the smaller, slower planes base crews at only 7 of the 40 cities serviced. Which flights are to be flown by crews from which bases are determined by the company, but many factors influence such decisions. The equipment qualifications of the crews already assigned to each base, the crew expenses incurred if the flight is flown from that base, the seniority of the crews compared with those at other bases on the flight route, the likelihood of crews requesting reassignment if trips are not to their liking—all of these factors enter into a decision. An airline has to take a good hard look before implementing a schedule that will require additional crews to be trained when sufficient numbers already exist to meet the maximum utilization of the available equipment.

GROUND OPERATIONS AND FACILITY LIMITATIONS

Ground service can be arranged in any conceivable schedule pattern, provided that there is no limitation on the gate positions, ground equipment, passenger service facilities, and personnel. But, of course, there are limitations. First, it is physically impossible to obtain adequate facilities in many instances within a reasonable period of time. For example, additional gate positions at Fort Lauderdale/Hollywood International Airport are virtually impossible to obtain. Second, there is the matter of cost. The schedule planner must do the utmost to avoid excessive flight congestion. The objective of ground service, then, becomes to accommodate as many flights as possible and as efficiently as possible, consistent with physical limitations and prudent utilization of personnel and equipment. The schedule planner must consider all of the following at every station for every proposed schedule:

1. Are there enough gate positions for the number of planes on the ground simultaneously, including a cushion for early arrivals or delayed departures?

2. Is there adequate ticket-counter space to handle the passengers expeditiously?

3. Is sufficient time provided for on-line or interline transfer of passengers, baggage, mail, and cargo?

4. Can the planned flights be handled efficiently by the present level of ticket-counter, ramp, and food service personnel? If not, will additional revenue from the new flights or the new connection be sufficient to more than offset the cost of additional personnel?

5. Will the proposed schedules introduce a second or a third personnel shift? Conversely, will a minor flight adjustment permit the reduction of one shift?

6. Is there ground equipment of the right type: aircraft starter units, baggage vehicles, cargo conveyors, forklifts, tow tractors? If not, is there sufficient lead time to purchase them, and can they be economically justified? Should the carrier contract these services from another carrier because of the small number of flights into a particular station?

7. Does the proposed schedule overtax food service facilities?

These and many other questions must be answered for every station on the system for every schedule change. Any corrective action—and there is always a need for flight adjustments to meet ground service requirements—must be rechecked to determine its effect on the delicate balance worked out to accommodate sales, maintenance, and operational needs and to make sure that corrective adjustments at one station are not creating complications at another.

Normally, the scheduling department measures the physical and personnel requirements with a visual layout of the schedules at each station. All flights are plotted on a station plotting chart that documents sequence and schedule time of operation using certain standards and codes. After posting proposed flight times on this chart, the scheduling department must first determine that it has not exceeded the gate capability. Therefore, the first adjustments are those necessary to bring schedule times into line with available physical facilities. It shows precisely the amount of time

an aircraft requires to maneuver into a gate position, the scheduled arrival time, the period of time it is at the gate, its scheduled departure time, and the length of time needed to clear the gate. The chart also shows whether it is an originating flight, a through trip, a terminating flight, or a turnaround.

Scheduling is sometimes restricted by ticket-counter space. For example, if a carrier had only four ticketing positions at a major location and one ticket agent could check in about 20 passengers an hour, the four ticket positions could handle one 757 flight. But if the carrier wanted to schedule three jet departures within a 45-minute period, it would have several alternatives. The carrier could, of course, go ahead and schedule these three flights, at considerable inconvenience to the passengers—forcing them to stand in line much too long—as well as at risk of jeopardizing on-time departures. The preferred solution would be not to schedule the two added trips until the carrier had expanded its ticket-counter facilities.

Station staffing is determined by application of time-study standards and formulas. These have been developed and are applied much the same as any manufacturer's production line time and workload standards. Schedulers use separate standards and formulas for ticket counters, ramp and load control, ramp cargo handling, food service, and freight facilities.

Like personnel staffing, flight peaking presents a major problem for the effi-cient utilization of ground equipment. Ground equipment costs to handle peak traffic can run into the millions of dollars at any one location. Understandably, carriers are anxious to reduce these requirements if they can do so without affecting other costs or revenues or service. Whenever a carrier changes schedules or adds flights, adequacy of ground equipment must be checked closely, not only because of expense but also from the standpoint of lead time.

In conclusion, the schedule planner contends with a variety of challenges in the ground operations area, many of them conflicting. Scheduling is literally hemmed in by space limitations. Yet planners must find gate positions for the essential flight complexes. They must keep personnel costs at a minimum but at the same time staff for flight connection opportunities to maximize service to the public. And they must avoid new capital outlays for expensive ground equipment yet do everything possible to enable flight peaking at times when passenger demand is greatest.

Every situation has to be studied separately at each of the carrier's stations, with every item of added cost weighed against the estimated added revenue. No decision can be made without carefully assessing its consequences.

SCHEDULE PLANNING AND COORDINATION

Thus far, we have discussed the particular problems faced by maintenance, flight operations, and ground operations. Each offers a multitude of requirements for the schedule planner to take into

consideration. The responsibility for schedule development is the province of the scheduling department, which is generally within the marketing administration and which oversees the entire system. This department must pull together all of the factors discussed so far, plus many more. Just how a carrier goes about this task is the focus of this section.

Nothing is more basic to an airline than the schedule pattern it operates. All productive resources—planes, trained personnel, and ground facilities—have the one essential function of operating the schedule safely and dependably. All selling resources—the
carrier's ticket offices, reservations offices, sales representatives, marketers—have the one essential function of getting passengers and shippers to use the schedule. Let's take a look at some of the problems and complexities of developing a sound overall schedule pattern in these hectic post deregulation times.

At the outset, let us recognize the sheer impossibility of developing a schedule pattern that will simultaneously satisfy all desirable objectives. Many of these objectives are inherently in conflict. For example, a carrier must provide enough time on the ground for maintenance and servicing operations while at the same time keeping aircraft in the air as much as possible for economical utilization. It must build up complexes of connecting

flights at major gateways while at the same time avoiding excessive peaking of station activity. It must maintain schedule stability for the convenience of passengers and the optimal utilization of employees while at the same time displaying the flexibility needed to adjust rapidly to new competitive threats or other developments. It must recognize that public service obligations will sometimes work against strictly economic considerations while at the same time remembering that it could not provide any service without a sound financial position.

Probably the schedule planner's most important function is to evaluate all of these varied and partially conflicting objectives and come out with the optimal balance between these several goals. Some of the problems faced by a schedule planning department are comparable to those that many other industries face in their own respective product planning:

- Determining the size of a given market and projecting its future growth
- Estimating the effect of planned product changes on the size of the total market and on the carrier's own share of the market
- Attempting to forecast what the competition may do and developing a plan of action to meet such competitive thrusts
- Estimating the costs and revenues of the alternative plans of action to determine which will be profitable.

But the complexities of airline scheduling extend far beyond these problems. Many airline marketing problems are unique, stemming from the special nature of the business. Principal among these are (1) the problem of traffic flow, (2) the sensitivity of schedule salability to even minor differences in departure times or other factors, (3) the operational difficulty of accomplishing schedule adjustments as desired, because of problems of time zones, station

personnel, equipment turnaround, and the chain reaction effect, and (4) the financial leverage of load factors.

Traffic Flow

The concept of traffic flow—or the number of originating and connecting passengers on a particular route—is widely recognized; the degree of its importance is not sufficiently understood. Smooth traffic flow helps to explain schedules that seem quite excessive in relation to origin-destination traffic.

The schedule planner must take advantage of traffic f low opportunities but cannot wave a magic wand to create such opportunities. By its very nature, traffic flow varies from case to case, depending on geography, route structure, and alternative service available. Some cities, because of favorable geography, obtain maximum benefit from traffic flow; others do not. An airline cannot change this, and a carrier cannot generalize that City A can support a certain type of service simply because City B receives such service.

A few years ago, a route such as Chicago–Los Angeles received traffic flow support from the Los Angeles-bound passengers coming from major points in the northeast, including New York, Boston, Philadelphia, Cleveland, and Washington, D.C. Today, direct nonstop service from these other points to Los Angeles has drained away much of the traffic flow that formerly moved over the Chicago gateway. And this same development is taking place continuously throughout the air transport system.

This constitutes another reason for the impossibility of generalizing about traffic flow and about the type of service a community can economically support. Not only does traffic flow vary from city to city because of geography and route structure, but even for a single city the flow varies from year to year, depending on the type and volume of nonstop service that may be bypassing that city.

Schedule Salability

The second of the special complexities of airline scheduling is the fact that schedule salability is highly sensitive to even minor differences in departure time or other factors. Quite often, several key personnel will spend several days trying to work out a change of just 15 minutes or half an hour in the departure time of a transcontinental jet. This is not time misspent; experience has shown that even such minor adjustments can significantly affect the success of a flight.

The reason is that schedule convenience ranks high among the competitive elements affecting the traveler’s choice of an airline. Loyalty to a particular airline will not normally cause a passenger to sit around an airport an extra hour or to miss a business appointment or to wake up earlier than usual if a competitor offers a viable alternative. To make schedule planning even more complicated, schedule salability not only varies by time of day and by route but also has a different pattern of variation between the two directions on the same route.

Schedule Adjustments

An airline's total schedule pattern represents a tightly woven, highly interrelated structure. Many aspects are rigidly governed by specific regulatory or contractual requirements, such as those relating to maintenance of equipment, and working conditions of flight crews, as discussed earlier in the chapter. Moreover, almost every schedule is intertwined with other scheduled flights because of connections, equipment routing, or other factors.

Load-Factor Leverage

Now let's turn to the last of the special complexities of airline scheduling, the problem of load-factor leverage. One of the unfortunate facts of the airline business is that the carriers produce revenue passenger miles but sell available seat-miles—hence the importance of load factors. In other industries, a manufacturer can estimate the probable market for each individual product and then gear production accordingly. And, if overestimation has occurred, the manufacturer can add the surplus to inventory and dispose of it, perhaps at a reduced price.

An airline has no similar opportunity. It may be convinced that, say, a given nonstop jet to Los Angeles will average only 80 to 90 passengers per day. Nevertheless, if it operates the schedule, it must fly a seat-mile including 230 seats. And, of course, once it produces the empty seat-miles, they are irretrievably lost. Costs of operating a schedule vary only slightly as load factor changes, whereas revenue varies in direct proportion to changes in load factor. Thus, a shift in load factor of only a few percentage points can make all the difference between a money loser and a profitable trip.

EQUIPMENT ASSIGNMENT AND TYPES OF SCHEDULES

The scheduling department will generally refer to aircraft throughout the system as being operated in either in-service or out-of-service use. In-service use refers to those aircraft being flown (1) on scheduled service, (2) as an extra section, or (3) as a charter flight. An extra section is an additional aircraft assigned to handle a particular flight because of an unusually large number of passengers. Out-of-service use refers to those aircraft temporarily assigned for major overhaul, maintenance checks, flight training, special projects, such as installing different seats, or line reserves. Line reserves are extra airplanes stationed at major terminals to be called on in the event of a problem with a scheduled flight.

Airlines use four basic schedule types in assigning their equipment: (1) skip-stop, (2) local service, (3) cross-connections (hub and spoke), and (4) nonstop. Skip-stop scheduling refers to the practice of providing service to points A, B, C, D, E, F, G, and so forth by scheduling flights in the following manner: A–C–E–G or A–D–G, or similar combinations in which one or more of the intermediate stations are "skipped," with service being provided by other flights. The principal advantage of skip stopping is to provide fast service to intermediate stations; the principal disadvantage is in not providing service between consecutive cities.

In local-service schedules, shorter-range aircraft make all stops on a segment and connect at larger intermediate stations with long-range aircraft. The principal advantage of local service is that it provides fast service between small intermediate stations and terminal points; the principal

disadvantage is the change of planes involved. Cross-connections (hub and spoke) are frequently used in schedule planning by all airlines. An example of a route over which this can be accomplished is the United Airlines route serving the principal cities shown in Figure 12-14. When a Washington–Chicago–San

Francisco flight, a New York–Chicago–Seattle flight, and a Boston–Chicago–Los Angeles flight arrive at Chicago essentially at the same time, traffic can be transferred from one to another, thereby providing more daily service between points in the east and those in the west. This is the principal advantage, particularly if one of the flights is the only one to serve one or more of the stations; principal disadvantages are the change in planes and the congestion of traffic. (The next section discusses hub-and-spoke scheduling in more detail.)

Nonstop are being used more frequently than ever by the major and national carriers. The principal advantage is provision of fast service between terminal points; there is no real disadvantage, although, of course, no intermediate stations receive service on these flights.

Actually, all airlines have used and will continue to use all four major schedule types with variations to fit their individual needs. The types most adapted to a fleet of same-range airplanes are skip stopping and cross-connections; for a fleet of at least two general types of airplanes, all four schedule types can be used, with perhaps more emphasis on local service and nonstop.

HUB-AND-SPOKE SCHEDULING

Deregulation has led to significant changes in the routings and schedule patterns of the carriers. A catalyst for these changes has been the greatly increased emphasis on hub-and-spoke scheduling. Deregulation eliminated airlines' incentive to dissipate their added revenues through wasteful expenditures on extra (and underutilized) flights along the route structure mandated by the CAB. In addition, deregulation allowed carriers to create new schedule patterns that lowered the costs of providing new flights.

In the past, there was constant pressure (from communities and from the CAB) for more and more direct point-to-point nonstop. If a carrier did not exercise its franchise of nonstop operations in a particular market, it risked having that community induce another airline to seek the unused authority from the CAB. This concept of nonstop obligation was carried right into the Airline Deregulation Act, which classified "dormant authority" as any route segment not then actually served nonstop and, as the first step toward liberalized route grants, provided for the transfer of dormant authority to other carriers.

Many city-pair markets, however, could not support nonstop service in terms of their own origin and destination traffic. Economic viability frequently depended on adding trafficflows from backup markets on either end of a nonstop route. In CAB route cases, cities often were added to a carrier's route system specifically for the purpose of providing enough traffic to make nonstop service viable. Because of the protection afforded by a regulated route franchise system, the backup markets for some nonstop routes could be expected to remain relatively stable over long periods of time.

In this framework, the airline route structure evolved gradually into many "linear" patterns, in which one city would mainly serve as backup to some specific route segment, while other cities would back up other routes, and so forth. With deregulation, carriers could no longer regard their backup traffic markets as stable or secure. There were, of course, some hub-and-spoke connecting operations, but their scope was limited by the route franchises then in effect. In response to competitive pressures following deregulation, carriers rapidly replaced the old structure with a hub-and-spoke system. In hub-and-spoke systems, several points of departure are fed into a single airport (the "hub"), from which connecting flights transport passengers to their various destinations (along the "spokes").

The main advantage of the highly developed airline hub-and-spoke operation is that it provides an enormous "multiplier" effect as to the number of city-pairs an airline can serve with a given amount of flight mileage.

Disadvantages of Hub-and-Spoke Systems

Although hubbing seems to benefit airlines and offers some advantages to travelers, the extent of excessive concentration at the hub can result in some negative economic impacts, namely, congestion delay. As aircraft volume approaches the capacity of the hub airport, congestion delay increases rapidly, which may outweigh some of hubbing's benefits to both airlines and passengers. This additional delay increases passengers' total travel time and adds to the airlines' operating costs (for example, wages for the crew and fuel and maintenance expenses for the airplane). Congestion during peak periods also puts a tremendous strain on airport and airline personnel. It requires maximal staffing for each 45-minute peak-staffing at the gate, on the apron, at the ticket counter, and at curbside. Moreover, for each city feeding into the hub, a separate gate is required, and adding more cities requires more gates. On the tarmac, the launching of 30 aircraft within a 5- to 10-minute period can cause excessive taxi waits, forcing schedulers to build additional minutes into block times.

During bad weather, delays at one hub airport create delays system wide. The requirement that aircraft arrive at the hub at the same time is costly. Airplanes serving the shorter spokes must sit on the ground at the out-stations, often for hours, to compensate for those airplanes on the longer segments. Also, because scheduling into the hub is based on the times of the connecting complexes, actual departure times at the out-stations may not be the most convenient for the communities. Some portion of the potential local O & D market is at risk of being left unsatisfied. To compensate for this, some carriers have increased the use of the regional jet (RJ) concept. Consumer demand in out-station markets continues to grow rapidly as more and more passengers are flown from secondary locations through hubs and on to secondary locations.

Still another problem is baggage. Most complexes provide between 30 and 45 minutes for passengers to make their connections. When flights are late, however, there is very little leeway for the baggage to make the same connection. Passengers simply walk from one gate to the other and board their new flight. Baggage, on the other hand, must be off-loaded, sorted, transferred, and loaded aboard the new aircraft. When off-schedule operations occur, the 30- to 45-minute connecting time guarantees a high mishandled-baggage expense. Congestion delay also creates

additional work for air traffic controllers and increases their stress levels. It may require upgrading the ATC facilities and adding more personnel at the ATC centers and airport towers. Finally, excessive aircraft concentration at the hub can have adverse environmental impacts, such as noise and pollution. These negative economic effects of aircraft concentration must be taken into account when conducting cost-benefit analyses into building or expanding major hubs.

DATA LIMITATIONS IN AIRLINE SCHEDULING

Since the early 1980s, sophisticated computer programs, which use complex mathematical algorithms, have been developed to address the complete scheduling task. The most widely used are those programs that assist with the mechanical complexity of assembling up to 1,000 fllights, efficiently routing aircraft across flight segments, and assisting the carrier in meeting constraints imposed by such factors as maintenance requirements, flight operations and crew scheduling, ground operations and facility limitations, and passenger service needs. However, airline scheduling remains a function that involves as much art as science.

Although detailed traffic data are available on-line, historically, airline scheduling has been performed with limited sources of traffic data. Station managers observe competitor enplanements, and many carriers participate in informal information exchanges with one another. The problem with this type of information is that its accuracy is questionable and it is only available on an aggregate basis. The DOT forms 41, T-100, and Ten Percent Surveys of Domestic and International Traffic are basic schedule planning and route analysis tools, and although the information they provide is beneficial, there are problems concerning data accuracy and level of detail. For example, these sources provide limited information on flight numbers and passenger origins and destinations and are typically not available from the DOT until three to six months after the flight date.

The availability and presentation of these data by commercial information service organizations has improved significantly in recent years. The DOT data are available on easy-to-use CD-ROMs and can be abstracted readily for use by scheduling analysts. Current data regarding international carriers are more difficult to obtain. Organizations such as the IATA and ICAO collect highly aggregated information that is generally not available for years. Not only is the information dated, it is often incomplete because of the reluctance of many carriers to share data for competitive reasons. Advances in telecommunications and computer science are providing better information sources for the airlines. Along with better information, more sophisticated analytical tools are being developed using electronic data sources. However, even with new information resources and more sophisticated analytical tools, airline scheduling will continue to be a complex and challenging task.

AIRLINE FLEET PLANNING AND MANAGEMENT

One of the most difficult decisions airline managements must make is whether to buy new or used aircraft and what type. Alternatively, they must consider whether it makes better financial sense to modernize older aircraft already in their fleet or to acquire aircraft from the outside. Many additional factors, including the costs associated with engineering and maintenance, must be weighed. The factors are constantly changing, and their relative importance at each airline depends on the carrier's individual situation.

FACTORS IN FLEET PLANNING

Purchasers of new aircraft can generally get by for 7 to 10 years without having to make any major structural repairs. Furthermore, maintenance costs as a percentage of total costs have been steadily decreasing since the 1960s. However, percentages do not necessarily present a true picture. If one set of costs, such as for maintenance, rises less steeply than others, its percentage of the total may drop although the cost in absolute dollars may be rising. In this context, a set of figures from American Airlines is worth noting. Over the 20-year life of a 707, American found that maintenance costs rose 10 percent but that improvements in reliability more than compensated for the rise. This was in terms of current dollars. When translated into constant dollars, which take inflation into account, the situation was even better: maintenance costs actually dropped.

It would be quite simple if maintenance were the only, or the most important, factor to consider in fleet decisions. But besides maintenance costs, many other factors must be balanced against one another: the price of fuel; the availability and price of used aircraft; resale value; the price of new aircraft; terms of purchase; cash flow; debt/equity ratio; the availability of money from lenders; the receptivity of Wall Street to the issuance of stocks, bonds, and debentures; interest rates; route structure; competitive situation; strategy; and labor costs. All are even more important than before in today's deregulated environment.

The Pre-deregulation Era

Before deregulation, the airlines constituted a fairly stable business, and fleet decisions were much simpler, usually based on technical considerations. The airframe and engine manufacturers came up with improved models, and the airlines bought them on about a five-year re-equipment cycle. In the pre-deregulation world, the carriers would buy up the new aircraft coming on the market despite their high prices. The highly efficient and reliable engines, digital avionic cockpits, outstanding performance, and improved maintainability of these aircraft seemed to make them irresistible. But that simply hasn't been the case.

In the old days, overall costs could be predicted with some degree of confidence. Traffic kept growing, and routes were protected by the civil aviation authorities. Lenders were secure in the knowledge that loans would be repaid on time. Even the weaker carriers could get the financing

they needed, because under the "failing carrier" doctrine, the CAB would, if necessary, find them a stronger airline as a merger partner. Northeast Airlines was merged into Delta under this doctrine in the early 1970s when the former ran into financial difficulty.

Before deregulation, there were excellent technical reasons for massive replacement of aircraft. The advent in the 1960s of the turbine engine and in the 1970s of the wide-body airframe permitted quantum jumps in productivity. Technical progress since then, although impressive, has been more in the nature of step-by-step advances. Today, there has to be a much more careful analysis of costs versus benefits before fleets decisions can be made.

Deregulation changed the rules of the game. New nonunion carriers, usually flying relatively inexpensive used aircraft, invaded traditional markets with low fares. Other low-cost carriers, such as Southwest Airlines, expanded their systems into new markets. To make matters worse, the price of fuel soared to over $1 a gallon. The old, established trunk carriers, whose fleets philosophy had been to prepare themselves to meet peak demands, were stuck with fleets of three- and four-engine aircraft flown by cockpit crews of three or four and with power plants designed at a time when a gallon of fuel cost only 10 to 15 cents. The new carriers, on the other hand, flew twin-engine aircraft with only two pilots in the cockpit.

With deregulation, the established airlines had to find ways to reduce the operating costs associated with aircraft already in their inventory that were not as efficient as the newer generation of equipment. The incumbent carriers began to focus on new equipment that generated the lowest operating costs and were available in sufficient quantities and at the right times to meet their fleets and market-planning requirements. The strong market for used aircraft enabled many of the incumbent carriers to upgrade their fleets more rapidly and, even with higher labor costs, to compete successfully with the start-ups.

The Hub-and-Spoke System

In the quest to achieve the lowest possible unit cost, U.S. airlines have come to stress hub-and-spoke route systems where practical. This, too, has had a profound influence on new aircraft requirements. Lift capacity has tended to be greater in smaller aircraft with shorter full-payload ranges, such as American's MD-80s, United's fleets of 737s of various models, and US Airways' ERJs and CRJs.

Hub-and-spoke networks have influenced airlines in other ways. Although the air carrier community has long recognized economies of scale (as reflected in the preference for a large number of identical aircraft), it has also come to appreciate that, with deregulation, economies of scope are perhaps as important as economies of scale. This has led carriers to serve not only more city-pair markets but more varied markets than ever before. This, in turn, has caused the largest airlines to require a wider variety of aircraft than ever before. Indeed, the range of attributes embodied in such aircraft appears to be broadening as economies of scope are pursued, partially through airline consolidation.

Hubs have also influenced carriers' decisions with regard to larger aircraft, such as the Boeing 767 and Airbus A330. As the hubs become increasingly congested and slot limitations more constraining, there is a natural tendency to schedule larger aircraft rather than smaller ones through the hub, especially during periods of peak activity. This, too, has led to a proliferation of certain types of aircraft in the fleets of the larger carriers reliant on hub-and-spoke networks. Here, also, there has been a happy conjunction of events: changes in the so-called two-engine rule have increasingly enabled airlines to operate larger twin-engine aircraft intercontinentally and internationally as well as on shorter hauls.

Technical Aspects

During the early years following deregulation, most major carriers were reducing, and even liquidating, whole staff departments, including, in some cases, all their engineering personnel. Under such circumstances, the physical aspects of aircraft to be acquired have been left increasingly in the hands of the manufacturers of aircraft, engines, and associated equipment. Indeed, with the economics of aircraft having become the most critical issue, not surprisingly, the aircraft purchasing decision has become simpler again. Typically, an air carrier's senior executive concerned with financial and market performance of the airline dominates the aircraft acquisition decision process, and those engineering personnel that remain, as well as the operating staff (including pilots), play a much more reactive than proactive role.

In part, this can be seen by the relative ease with which the heavily innovative Airbus A320 is being sold to major airlines. Here is an aircraft that embodies a number of truly innovative concepts and much new hardware and software. In a former age, this would have given pause to most airline engineering departments, which would have preferred to see much more incremental technological steps because of their typically conservative approach to fundamental changes in aircraft technology.

For example, the total fly-by-wire concept in the A320, together with its side stick controls, represents a substantial departure from past practice, and surely most airline engineering departments would caution their managements to go somewhat slower. This is not to suggest that the A320 is an unwise choice or poses any threat to safety. But the aircraft is being acquired primarily because it promises lower-cost production of the airline product, not because of its inherent differences—which most passengers will not recognize in any case.

Until the mid-1990s, the A320 was originally purchased with little airline engineering input. This was best reflected in the fact that the A320 incorporated components in its vital avionics system that were supplied by manufacturers with little or no previous success in the air transport market. Given the nature of the A320 (and a growing number of modern aircraft types such as the Boeing 777), avionics installations are integral to the aircraft. The fact that many airlines purchased the A320 with critical components from suppliers with whom they had never previously done business showed strong support for the contention that airline engineering departments were substantially out of the loop so far as decisions to purchase new aircraft were concerned. Today, the A320 is an aircraft with a proven history, and airline engineering departments are able to provide important input in the fleets-planning process.

Fleet Rationalization

Consolidation of the industry during the 1980s as a result of mergers has led to a proliferation of specific aircraft types operated by any particular carrier. No doubt, much of this proliferation will be reduced as fleets rationalization becomes both practical and possible. Although fleets rationalization may well be a first order of business for consolidated airlines, such carriers still need to acquire new aircraft not only to address new markets but also to enable them to enjoy the benefits of maximum practical fleet commonality in the long run. What will influence the acquisition process involving new aircraft is the economic organization of the airline industry as consolidation proceeds. The issue is the behavior of the airline industry under conditions of oligopoly.

Economic theory suggests that as airlines become fewer in number, there will be tacit understanding with regard to fare levels and structures, even though no formal or strictly illegal agreements are reached. Cost minimization will not be completely disregarded.However, with greater price stability and with the behavior of competitors reflecting their own acquisition of a greater measure of monopoly power, product differentiation through service rather than price will certainly become more important.

With aircraft once more playing a greater role in determining a carrier's market share, coupled with the mild relaxation of cost-cutting pressures that consolidation will induce, airlines can be expected to add staff, especially as consolidation increases and the scale of individual airlines supports specialization of function within the organization. Under such conditions, airlines capable of acquiring significant blocks of new aircraft are likely once more to move in the direction of formalizing the fleet decision-making process. Although that process will necessarily be more concerned with the economies of the aircraft than it was under comprehensive economic regulation, engineering considerations will once again matter.

Consolidation also increases the interdependence between mega-carriers on the one hand and the manufacturers of aircraft and engines on the other. Whether such interdependence will be as great as in the period between 1933 and 1960 remains to be seen, but it will be an important factor. For example, with fewer airlines to serve as sponsors and launch customers for a new aircraft type, and with such airlines having requirements for a very large number of such aircraft, these carriers may seek to sew up the production capabilities of a given manufacturer by receiving initial delivery of a large number of aircraft—if not at the beginning of the production run, then somewhat later. The manufacturer, on the other hand, has every incentive to spread deliveries among as many air carriers as possible. As the number of airlines capable of placing launch orders and of becoming sponsors of new aircraft types diminishes with consolidation, the manufacturers will also experience added pressure to lower prices.

Still another anticipated effect of consolidation and subsequent fleets rationalization is that aircraft will tend to stay in the fleets even longer. This gives rise to the possibility of far longer depreciation periods than are now being experienced. This will result in the replacement cycles for new aircraft being extended and manufacturers becoming less able to market innovative types of aircraft as frequently as in the past. But if, as expected, airline consolidation does lead to

heightened pressure to reduce aircraft prices and to a diminished willingness of the carriers to acquire innovative new aircraft so frequently, this may well serve at least the short-term interests of the manufacturers as well as of the air carriers.

But there is another side to this coin. Specifically, manufacturers of aircraft and their components, as well as the airlines, have benefited materially from the ability and willingness of most such enterprises to accept innovation. Were technological change to become less highly prized, there is a real question as to whether airline industry growth could be as vigorous as it would otherwise be. Perhaps more critical is the question of whether any seriously reduced propensity to innovate on the part of the manufacturers of aircraft and components will delay the advent of such equipment as the projected hypersonic vehicle and, at the other extreme, the tilt-rotor aircraft.

Consolidation means greater control of the market by fewer airlines. If the lessons of other industries are a valid guide, such consolidation inevitably will lead to a reduced propensity to accept innovation from manufacturers. In turn, this will influence the latter's own propensities to implant advanced technology.

The extent and character of the pace and direction of technological change in aircraft and components may well be substantially determined by the extent to which airline consolidation becomes a global phenomenon. If consolidation is constrained in some nations, the inter-carrier competition that remains may nevertheless be enough to enable the waning number of aircraft producers to continue to pursue innovation as a means of product differentiation and cost reduction.

Fleet Commonality

One of the main reasons for aircraft purchases in large numbers is fleet commonality. The Boeing 757 and 767 have common type-rating requirements, a distinct advantage to the carriers operating both types, as well as a strong inducement for airlines that are operating either model. The new generation of the 737 family provides various models with identical cockpits and seating from 100 to 180 passengers, which offers airlines using such models greater flexibility for planning new routes. Commonality is also apparent in the Airbus series. The A320/321 and the A330/340 share many of the same component parts and flight deck instrumentation.

Engine choice is offered on almost all new transports having 200 or more seats, an important factor in decisions to buy a particular type. Usually, the selection is based on power plant commonality with other aircraft in the operator's fleets. Sometimes, it is a politically motivated decision, especially when the air carrier involved is government-owned or heavily subsidized.

Long-Range Aircraft

The Boeing 777, launched in 1990, is aimed at markets between the 767 and 747. It competes directly with the A330/340 series and the MD-11. The 777 is the first commercial airliner with the option of folding wings, allowing it to fit its otherwise long wings (for required range) in most existing airport gates. However, as of early 2006, no aircraft operator had ordered a 777

with this option due to high costs ($2 million per aircraft). In 2008, Boeing will launch the 787 Dreamliner, a mid-sized twin-engine wide body aircraft that will carry between 250 and 300 passengers. This aircraft will compete against Airbus' 350, a 250- to 300-passenger long-range aircraft that will be available in 2010.

Because of the hub-and-spoke system's drawbacks, airlines are currently rethinking route structures and are considering new aircraft that can economically bypass hubs and provide point-to-point service. This would certainly win friends among the traveling public. Point-to-point service has always been popular, but the concept has even more appeal for travelers today because of their increasing frustration with air traffic delays and mounting congestion at major hub terminals. Bombardier's Canadair CRJ series and

Embraer's EMB-135 and EMB-145 regional jets are aiming at this market niche. Since the events of September 11, 2001, many airlines have refocused on point-to-point services to cut costs. In most cases, the regional jet is used because of efficient operational costs and reduced load-factor requirements compared to other aircraft.

The Trend Toward Leasing

The choice for an airline interested in financing a new airplane is, ultimately, to lease or purchase the aircraft. Before the 1980s, most established airlines chose purchase. Indeed, in 1984, only approximately 20 percent of the world's commercial aircraft were leased. By 2006, however, leasing had become far more popular, accounting for well over half of all aircraft acquisitions.

Two factors in particular explain why leasing tended to be more attractive in the late 1980s. First, the 1986 Tax Reform Act eliminated the investment tax credit associated with purchase. Under the investment tax credit legislation, taxpaying companies could deduct a fixed percentage (7 to 10 percent, depending on the type of asset) of the cost of the asset directly from their tax liability. Such credits constituted an effective reduction in the price of the asset to the acquirer, assuming that taxes were owed. These credits have no value to tax-exempt investors or to firms that are not profitable. Second, the act reduced allowable deductions from taxable income for depreciation. Accelerated depreciation allows firms to depreciate more than the actual depreciation of an asset for tax purposes. This has the effect of postponing taxes over the life of the asset, thereby increasing the rate of return on the asset. For financial reporting (separate from tax reporting), aircraft were depreciated over 12 to 15 years on a straight-line basis to a 15 or 20 percent salvage value. Specifically, Congress passed an alternative minimum tax provision such that profitable companies could not reduce their tax bills to zero with depreciation and other noncash charges. Under the alternative minimum tax, all noncash expense deductions after a certain threshold were disallowed or deferred, thereby reducing their value. There are two types of leases, operating and financial. An operating lease is a no cancelable short-term lease. Other than non-cancel ability, perhaps the most important characteristic of an operating lease is that at the end of the lease, the lessor retains full title to the asset and bears any market risk as to its value at that time. Also, the lessee shows no debt on its books because operating lease obligations are offered only as a footnote to the balance sheet. Similar to other leases, when an operating lease is signed and the asset is put into service, there is no large initial cash outflow from the lessee.

The other type of lease is a financial (capital) lease. With these leases, the financial effect is the same as a loan except that title to the asset remains with the lessor until all lease payments have been made. Under a financial lease, title passes at the end of the lease to the lessee for a preagreed-upon sum. The result is that there is no market risk on the value of the asset borne by the lessor unless there is default. Financial leases are required to be reported in virtually the same manner as loans. That is, the value of the leased asset shows in the assets of the corporation and the present value of the lease payments shows as a liability.

The operating costs of maintenance, insurance, and taxes are normally the same for both ownership and leasing. This occurs because under most operating leases, the lessee is responsible for maintaining the asset in good condition. The nature of the responsibilities of the lessee is revealed in the term "net-net-net lease," signifying that the lease payments are net of maintenance, taxes, and insurance.

Before 1990, default was not perceived as a major cost in the airline leasing business, either because airlines seldom ran out of cash or because in the unusual situations when they did, aircraft could easily be repossessed and placed with other airlines, often with only a quick change in the paint job. Thus, the default risk borne by the lessor was no more or no less than for a normal secured lender.

The advent of new leasing companies in the mid-1980s added a new dimension to the air transportation industry. Although sales and lease-backs with banks and other financial institutions have been around a long time, organizations such as GPA Group of Shannon, Ireland, and International Lease Finance Corporation (ILFC) of Beverly Hills,

California, were suddenly purchasing new airliners in rather spectacular numbers to lease to existing U.S. and foreign carriers. For the smaller carriers that lacked the huge amounts of cash needed to buy a couple of planes, leasing firms provided an attractive avenue to acquisition. Leasing also gave the smaller carrier the flexibility to trade up by exchanging (with its lessor) a smaller model for a larger one, as traffic dictated. By buying in quantity, of course, leasing companies get lower unit prices, a benefit reflected in the relatively reasonable rental rates they charge their customers. In fact, the leasing enterprise became so successful that the firms engaged in it became the airframe manufacturers' biggest clients. ILFC ordered 130 assorted aircraft in May 1988; then in April 1989, GPA Group bought a staggering 308 transports, valued at over $17 billion, the largest order ever in terms of units. United topped that dollar figure in October 1990 with a $22 billion order (with options) for 68 Boeing 777s and 60 Boeing 747-400s (half of each type being firm orders).

Naturally, these record volume orders obligated large-scale airframe production. As a result, GPA Group and ILFC also created a new market for themselves. Airlines that had previously ordered equipment directly from manufacturers found that they were unable to get deliveries when they needed the planes. To solve their problem, they turned to leasing companies. Indeed, financing has become a significant part of the air transportation business these days.

Moreover, because of the troubled state of the airline industry during the early 1990s, many financial institutions awaited the outcome of the bankruptcy of several major carriers. The aircraft manufacturers offered special incentives to boost sales. Boeing accepted a substantial amount of United stock around the time United ordered its new aircraft. Airbus Industries arranged a sizable loan for Northwest Airlines when the carrier converted options for 75 A320s into firm orders. Even the engine manufacturers have helped to arrange financing. In an unprecedented move in 1996, Boeing signed a contract with American Airlines and Delta to become their exclusive supplier of planes.

Why do so many airlines need new equipment? For a number of reasons, not the least of which is the fact that air travel became more accessible to more people in the 1980s.

More people were flying, and the airlines simply did not have enough capacity to move them all. Most orders originated to replace the aging aircraft in the world fleets. Once new models were delivered, it soon became clear that the modern aircraft would be supplementing rather than replacing the older jets. On the other hand, the older Boeing 727s and Douglas DC-9s will not be flying forever. Ever-increasing maintenance costs and fuel-inefficient turbines make older models much more expensive to fly. Operators of these planes must also contend with the public perception that they are unsafe. Ever since the top of the fuselage peeled off an aging 737 in flight in April 1988, the news media have been targeting the "sorry state" of the airline fleets. Yet it has been shown that an older plane, properly maintained, is as safe as the newest one in service.

Noise Restrictions

Most early orders for new-generation aircraft were conceived as direct replacements of older planes—usually with models of roughly the same size. But as it became obvious that air travel was increasing beyond early projections, the carriers started looking for larger aircraft with more seats to obviate the need to add more flights. This led to orders for models such as the Boeing 757 to replace the 727s and the McDonnell-Douglas MD-80 to supplant the DC-9s. More than 2,000 new jet transports were on order for delivery during the 1990s, indicating that the days for aging airliners in the fleets were undoubtedly numbered. Higher maintenance costs, higher noise levels, and higher fuel consumption make them candidates for replacement by newer-generation models.

What will happen to these planes that have served the public so well for so many years?

Some old 727s have, in fact, found a new home with Federal Express; hush kits have been developed so that they can meet the new noise rules. However, FedEx can absorb only so many; other aging units may be headed for South America or Africa, where noise is not yet a major issue.

Many factors must be considered before reaching the critical decision to acquire a specific number of a particular aircraft. All operating departments become involved in determining the number and type of aircraft required to implement the corporate strategy in future periods. This

process is referred to as fleet planning, or the aircraft selection process. However, before getting into the specifics of the process from an individual airline's standpoint, it is important to look at some of the problems faced by the manufacturer in designing and building a new aircraft.

DESIGN AND DEVELOPMENT—THE MANUFACTURER'S VIEWPOINT

The Boeing Approach

The design and development stages for a new jetliner can take from five to six years. In the case of the Boeing 757 and 767 models, the concept of a more fuel-efficient aircraft was born in the mid-1970s with the skyrocketing price of fuel. When the 757 was being planned, engineers for Boeing, working with the airlines, were hoping for a 10 percent reduction in operating costs compared to the 727 jetliner that the new aircraft was designed to replace.

In fact, Boeing had very modest ambitions for the 757. The original plan was essentially to modify the 727 to operate with two highly efficient engines instead of the three less efficient engines used on the 727. But as the months passed, Boeing's engineers kept making changes, and they finally decided to build the airplane more along the lines of the 767. About 60 percent of the parts in the 757 are interchangeable with parts in the 767; only

6 percent of the parts in the 757 are the same as those used in the 727. It should be noted, production of the 757 ended in October 2004 after 1,050 had been built.

Boeing promised a 22 percent improvement in operating costs over the 727—more than double the original estimate. The improvements are based primarily on the fact that a fully loaded 757 is 42 percent more fuel efficient than a full Boeing 727, the most popular commercial aircraft ever produced and the mainstay of the major carriers. The 757 is about the same size as the 727, but design improvements allow it to carry up to 63 more passengers with the 757-300 model. That is one reason for the reduction in operating costs. In addition, Boeing was able to use lighter-weight components, newly designed wings, and more efficient engines manufactured by Rolls-Royce and Pratt & Whitney. Despite the reduced need for fuel, the engines are so powerful that only two are needed to power the 757, rather than the three used on the 727.

The use of electronic monitoring devices and navigational aids allows the 757 to be flown by two pilots, as opposed to three for the 727, another improvement in operating costs. In the 757 cockpit, many of the common mechanical gauges and control systems are replaced by video screens and computers. The flight control systems are so advanced that, beginning shortly after take-off the plane can fly and even land by itself.

Like the 727, the 757 is a narrow-body aircraft with only one aisle. But passengers will notice many differences. For one thing, interior design changes, including higher ceilings, oversized storage bins, and wider window frames, give the 757 something of a wide-body appearance. For another, the lavatories have been moved to a more convenient location closer to the center of the airplane to help keep flight attendants out of the way of passengers and vice versa.

The 757 represents a compromise product that attempts to meet the basic need for a fuel-efficient aircraft by the major U.S. carriers. Understandably, the different carriers had their own ideas about a replacement for the 727. Some carriers were primarily interested in a medium-size, medium-range aircraft with two engines. Others were primarily interested in an aircraft with transcontinental range, over-the-water capability, and three engines. The problem became even more complicated as more carriers offered their own ideas. Boeing's answer was to develop a family of aircraft—the 757, the 767, and the 777—that attempts to respond to the needs of most carriers.

This is extremely important to a manufacturer because of the tremendous development costs of a new aircraft. It is impossible to have a single airplane or even several aircraft tailor-made, even for a major carrier. Because the break-even production point for a manufacturer can be anywhere from 200 to 600 aircraft, depending on the level of technology, a number of carriers must be interested in a particular aircraft before a manufacturer will make the necessary investment. Consequently, manufacturers bring in the airlines at the earliest possible time in order to get their ideas and to begin focusing on generic aircraft categories.

Designing and developing an appropriate family of aircraft to meet a majority of the airlines' needs has become even more difficult since deregulation. With new competition from other established carriers and from the newcomers, most of the large carriers are still in the process of rationalizing their current and future route structures in an attempt to determine where they want to be in 5 or 10 years. The major carriers have been dropping low-density routes and concentrating on their high-density, long-haul routes with more standardized fleets, the motivation being to improve efficiency (load factors and utilization). This specialization among the different levels of carriers presents a problem for the manufacturer that tries to develop an aircraft whose users' needs vary considerably. The custom of pre-deregulation days, when each carrier had various models of aircraft from different manufacturers, seems to be over.

Another important step in the process of designing and developing a new aircraft is taking an objective look at the company's product in comparison with its competition. It is important to select those characteristics for comparison that are of particular concern to the potential airline customer. Figure 13-1 shows a few of the characteristics of competing commercial aircraft of concern to a particular manufacturer. Here, we see comparative data on block speed, payload, unit operating cost, and return on investment. With comparative data such as these, the manufacturer can make judgments as to the relative importance in the eyes of the customer of, say, differences in speed and range and return on invested capital.

Challenges from Airbus

Before the Boeing and McDonnell-Douglas merger in 1997, Boeing's chief competitors for the 757 and 767 were McDonnell-Douglas's MD-80, MD-90, and MD-11, and Airbus Industries' A300, A320, A330, and A340. By 1996, the global market share for McDonnell-Douglas commercial airplanes fell to 4 percent of new sales. Boeing's proposal to acquire McDonnell-Douglas drew severe objections from the European aviation community and served to intensify the competition for new-generation aircraft. In 2001, Airbus surpassed Boeing in terms of market

share to become the world's largest aircraft manufacturer. Although Airbus is delivering more planes than Boeing, and has won the order battle each year since 2001, many industry analysts believe Boeing ended 2005 in a much better position than its rival, owing in large measure to the sales success of its 787 Dreamliner and the 777, which is crushing the Airbus A340 in market share.

Airbus Industries is determined to correct what its officials see as the abnormal situation of U.S. manufacturers dominating sales to the Western world. The founding partners, France and Germany, each had a 37.9 percent interest in the Airbus Industries consortium. British Aerospace held 20 percent and Spain the remaining 4.2 percent. Today, Airbus Industries is co-owned by European Aeronautic Defense and Space (EADS), with 80 percent interest, and BAE Systems PLC, with 20 percent interest.

Three huge transport planes, whale-like aircraft known as Super Guppies, continually ferry German fuselages, British-made wings, and other airliner sections to Toulouse, France, where the assembly plant is located. Many smaller parts and components are manufactured in the United States and shipped to Europe. Europe has obviously learned that one company or one country alone cannot make it in aviation manufacturing. In the 1960s and 1970s, there were a lot of good European aircraft—the Caravelle, the Mercure, the Trident, the BAC One Eleven, and the Concorde—but none was able to broaden its market significantly beyond Europe. Airbus Industries receives no subsidies from member countries, and although participating governments contribute funds for research and development, all such assistance is paid back out of aircraft sales. But the European venture undoubtedly benefits from some of its political connections. The Airbus has been ordered by several state-owned airlines, and top management is sprinkled with former political leaders.

Although the Airbus might have benefited from political help, most industry observers attribute its success not to politics, but to timing. The Airbus was the first large twin-engine aircraft on the market, competing successfully against Lockheed 1011s and McDonnell Douglas DC-10s, both three-engine aircraft that consume more fuel. Airbus Industries' program for production of the long-range A340 and the medium- to long-range A330 was formally launched at the Paris Air Show in June 1987. The A340, which took Airbus Industries into the long-range market for the first time, is available in two versions. The A340-300 carries 295 passengers in a three-class layout a distance of 6,850 nautical miles. The A340-200 carries 262 passengers up to 7,700 nautical miles. Both types have a maximum takeoff weight of 542,300 pounds and are powered by CFM 56-5C-1 engines, a more efficient and more powerful version of the CFM International engine that is used on the A320. The A330, a two-aisle, twin-engine aircraft, can transport 328 passengers in a two-class layout a distance of 5,000 nautical miles. It has a maximum takeoff weight of 454,100 pounds and can be powered by either General Electric CF6-8OC2 or Pratt & Whitney PW4000 engines. The A330 and the A340 are also offered in passenger/freight combination versions.

The design of the new models continues Airbus Industries' policy of maintaining a high degree of commonality in the systems, power plants, equipment, and structures of all its models. This

allows operators to realize many savings in training costs and in spares holdings and investments. The A330 and A340 have common landing gear and a common fuselage, with the A340-300 eight frames longer than the A340-200. Airframe commonality between the A330 and A340 has been raised to the high overall level of 85 percent.

The two models have an all-new, highly advanced wing, which Airbus claims produces a lift/drag ratio up to 40 percent better than early wide-body aircraft and will allow the aspect ratio to be increased from 26 to 34 percent. The variable-camber wing incorporates automatic load alleviation for maximum structural efficiency, adapting its profile automatically during flight to match changing conditions of weight, speed, and altitude. The only differences between the wings of the A330 and the A340 are those required for installation of the outboard engines on the A340.

The A330 and A340 also share a common two-member cockpit crew similar to that of the A320, incorporating the latest glass cockpit instrumentation and side stick controls instead of a yoke. Airbus estimates that the program will eventually achieve sales of about 1,000 aircraft, shared equally between the two types, and will give Airbus a full range of airliners to match carrier needs. This achievement of a full product line has been a long-held goal of the company.

In 1988, Boeing introduced its 747-400, which is capable of flying 412 passengers more than 7,200 nautical miles, 1,000 more than the 747-300. This means that Northwest Airlines, the fiirst to use these aircraft, is easily able to fly nonstop from New York to Tokyo without weight restrictions. The 747-400 represents a natural progression in the 747 family, which began service life in 1970 with Pan Am. Boeing's sales of the 747 reached 1,200 aircraft by the turn of the 21st century, covering the 747-100 and its long-range, short-fuselage variant, the SP; the increased-takeoff-weight 747-200; the stretched-upper-deck 300; and the 400.

In basic design, the latest model is substantially the same as that of the 300, with identical fuselage, flight controls, and wing section (as far as the wing tips). There are, however, three major differences: (1) the wings are extended by 6 feet and have 6-foot-high winglets; (2) an all-digital two-person-crew flight deck is substituted for the three-person, conventionally instrumented original; and (3) the aircraft is offered with new engines—the Pratt & Whitney PW4000, General Electric CF6-8OC2, or Rolls-Royce RB 211-524134a. The 747-400 also has capacity in its horizontal stabilizer for 3,000 gallons of extra fuel, bringing capacity to over 56,500 gallons. In November 2005, Boeing announced a new model called the 747-800. Technology will be based on the 787 and will be capable of flying up to 350 passengers in a three-class configuration up to 8,000 nautical miles.

Other changes include the use of new aluminum alloys developed for the Boeing 757 and 767; a change to carbon brakes, saving 1,800 pounds in weight; and a completely redesigned interior, providing greater seating flexibility, larger overhead storage bins, and a wireless cabin entertainment system, in which radio and visual signals are picked up from floor-mounted transmitters, greatly simplifying rearrangement of the interior.

Other Factors in Design and Development

Another important factor in the design and development stage is the ability of individual carriers to finance the proposed new aircraft. There is a direct relationship between aircraft orders and airline profitability. Although airline profitability is a key element in the design and development of any new aircraft, forecasting earnings and orders for some future period is a difficult task. Furthermore, forecasting the breakdown of orders by manufacturer and by type of aircraft for each manufacturer becomes an even more difficult task. Yet this important step must be taken before plans can be made to invest millions of dollars in the design and development of a new aircraft.

Finally, manufacturers must be concerned with the proliferation of government regulations regarding the design and development of a new aircraft through the certification stage. These regulations cover everything from safety to noise and emission standards. Consequently, manufacturers work closely with government regulatory agencies, including the FAA, throughout all of the production stages.

THE FLEET-PLANNING PROCESS

From an individual airline's standpoint, the aircraft selection process is an ongoing function coordinated by a generalist group, such as corporate planning, with major help from technical, or specialist, administrations such as finance and property, marketing, line maintenance, engineering and maintenance, and flight operations. The existing fleet of an operator also is a significant factor in an operator's fleet-planning decisions. Substantial savings in terms of training, spares inventories, and operations can be achieved by operating a common fleet of aircraft.

Information Needed

Basically, corporate planning is interested in information on four different areas in the flleet-planning process: the carrier's current resources, corporate objectives, projected industry environments, and marketing strategy.

Current Resources

The carrier's current resources include its present fleet inventory by type of aircraft, use, and month (see Table 13-2). Also included are financial and technical data on aircraft on order. Financial data include acquisition costs (purchase or lease), start-up costs (primarily maintenance and flight training), and unit operating costs. Technical data on aircraft currently on order include payload-range figures, cruise performance information, runway requirements, noise levels, parts and service availability, and flight characteristics. Labor resources are also included under current resources. Maintenance capability in terms of type and availability of personnel to be trained on the new equipment must be considered, and lead times must be established. Similarly, flight crews must be prepared in advance of delivery dates of aircraft currently on order. In short, the corporate planning unit must completely analyze the carrier's current resources—what it has now, what it has on order—as a starting point in the aircraft selection process.

Corporate Objectives. Top management's objectives for the company, or corporate objectives, include forecasted profitability (operating revenues and expenses, operating income, net earnings, earnings per common share, and return on investment), systemwide load factors, acceptable levels of cash on hand, market share on prime routes, debt/equity ratio, and general guidelines regarding new-aircraft acquisition. Other objectives include labor productivity improvement targets and cost-saving goals. Corporate objectives are broad and emphasize what is to be achieved, but not necessarily how it is to be done.

Projected Industry Environments. Projected industry environments include the outlook for the national economy, the outlook for the industry, and the carrier's performance within the industry. First and foremost, corporate planning is concerned with the national economic outlook: the gross national product, national income, personal income, disposable income, and level of consumer income in the next 1-year, 5-year, and 10-year periods. Next to be considered is the air transport industry forecast within the overall economy, including such items as revenue passengers and cargo tonnage, RPMs, ASMs, cargo ton-miles, revenue block hours, and so forth. This is followed by a forecast of the carrier's traffiic statistics within the industry. In addition, the carrier makes certain assumptions regarding passenger traffiic mix (business versus pleasure), cargo directionality, and price elasticity of demand in selected long- and short-haul markets.

Marketing Strategy. This is a key piece of information, requiring considerable interplay among corporate planning and other administrations, primarily marketing. Given the company's current resources and corporate objectives and the projected industry environments, how is the carrier to implement its plan, or marketing strategy? Significant items to be considered include how much service to provide between key city-pairs, how much emphasis to place on long-haul or short-haul markets or both, which weak markets to penetrate now or later or to eliminate, and in which markets to trade off profit for market share or vice versa. A critical area of consideration is fare and rate structure levels in various markets for both passenger and cargo service.

The Fleet-Planning Model

Computer models have been developed to translate this information into a fleet-planning model that is used in determining future aircraft acquisition requirements, aircraft assignment requirements, financial requirements, and operating conditions over various planning periods (2 and 3 years ahead for order versus option decisions, 4 and 5 years ahead to ensure that the purchases made in years 2 and 3 were consistent with long-term developments, and possibly 7 to 10 years ahead to ensure consistency and to gain insight into financial and facility needs in the long term). This fleet-planning model is commonly referred to as the unconstrained operating plan, because it ignores system constraints in order to ensure a full range of opportunities to be considered.

Computer-generated fleet-planning models provide corporate planning with the basic output—the number and type of aircraft to be acquired, the times of acquisition, and the timing of trade-in or phase-out of existing fleet. But they also allow management to assess the impact of altering

the information fed in, primarily corporate objectives, industry environment, and marketing strategy.

System Constraints

The next step in the fleet-planning process is the application of system constraints to the model output that has been derived. Generally, system constraints become more amenable to relief as lead time increases. In other words, over a 10-year period, the normal period for a fleet-planning model, the original constraints might be eliminated. Some constraints are external to the airline, such as facility requirements at airports into which the airline flies, including runway capacity, gate capacity, terminal capacity (parking, ground access, passenger processing), and community noise. Government regulatory bodies may impose constraints on the airline's operating strategies, with consequences for the aircraft designed to implement that strategy. For example, the State Department might decide after negotiations with another country that there is enough service between selected cities in that country, despite the fact that a carrier wants to expand its service. Airplane availability can also impose an external constraint, as can environmental considerations.

There are a number of internal constraints, including such economic realities as the airline's profitability or lack thereof. Suppose the model called for the acquisition of seven wide-body jets. If the funds cannot be raised to make the purchase, the company might want to consider leasing. Other internal constraints include maintenance facility requirements, crew-training facilities, and capability of existing personnel to implement the fleets-planning model.

After the system constraints have been applied to the fleet-planning model, corporate planning is left with a constrained operating plan, or optimization model. Basically, the airline has now broken down aircraft types needed to implement its plan according to characteristics such as range (long, medium, short), passenger or cargo capacity, and direct operating costs.

Aircraft Evaluation

The aircraft evaluation process can be broken down into fiive areas: consideration of design characteristics, physical performance, maintenance needs, acquisition costs, and operating economics.

Design Characteristics: Design characteristics include such factors as the aircraft's dimensions, weight profile (including maximum zero-fuel weight and operator's empty weight), fuel capacity, type of power plants, systems (electrical, hydraulic, and environmental), seating configuration, containers and pallets, bulk volume, and total volume. It is difficult to compare these various characteristics for competing aircraft, and the problem is compounded by the many options available on each aircraft. For example, Boeing's high-cruise-speed 747-300 with the upper-deck extension has many seating arrangements. In the upper deck, on the economy side, with seats at 34-inch pitch, 69 passengers can be carried. At the same pitch, so can 81, 85, or 91. At 32-inch pitch, the maximum number of economy passengers is 96. 42, 52, or 63 business-class passengers can be carried at 36-inch pitch. On the first-class side, 38 passengers at 40- or

42-inch pitch or 26 first-class sleepers at 62-inch pitch can be carried. Varied lower-deck-forward arrangements include 18 first-class sleepers at 62-inch pitch plus 63 business passengers, or 41 first-class sleepers at 57-inch pitch. There also are arrangements for 40 first-class sleepers at 60-inch pitch or 36 first-class sleepers at the same pitch.

A high-density all-passenger-configuration 747-300 could carry as many as 624 people. By comparison, the 747-300 combi (combination passengers and freight) can carry 278 passengers and 12 pallets or 360 passengers and 6 pallets. A choice of engines from Pratt & Whitney, General Electric, or Rolls-Royce is available.

Physical Performance. The technical parameters normally considered under this area are referred to as the physical performance factors . These include such items as payload-range diagrams, takeoff and landing data, cruise and approach speeds, runway requirements, and noise performance. Payload-range diagrams demonstrate the relationship between payload (passengers and cargo) and the distance an aircraft can flly. For each aircraft under evaluation, there is a maximum payload that can be carried over a particular range. Beyond that point, payload must be reduced to accommodate more fuel. Also, for routes over mountains, there must be consideration given to the maximum altitude that the aircraft can fly.Runway requirements are another important physical performance factor in the selection of an aircraft for those airlines operating out of airports situated well above sea level or in extremely hot climates. Finally, aircraft noise requirements continue to change airline priorities with respect to equipment decisions.

Maintenance Needs. Maintenance needs include such considerations as spare parts availability, aircraft compatibility with the rest of the fleet, product support, technical record keeping, and training support in terms of visual and audio aids. Maintenance cost comparisons over the expected service life of the equipment must be studied. These expenses are influenced by a number of factors, including stage lengths flown and amounts paid for outside services.

The corporate planning department works closely with the engineering and maintenance and flight-operations administrations in evaluating the technical factors (design characteristics, physical performance, and maintenance considerations). Contacts are also made with other airlines that have ordered or are considering similar equipment. And the airline's technical personnel make extensive on-site inspections. Having narrowed the choice of aircraft on the basis of these technical factors, the airline must consider the final two, the acquisition costs, including payment terms and financing, and the operating economics of the aircraft.

Acquisition Costs. Acquisition costs include the cost of the aircraft itself plus spare parts, ground equipment needed, maintenance and flight training required, and the cost of the money itself if the aircraft is to be financed through debt financing (borrowing from various financial intermediaries, such as insurance companies or commercial banks) or equity financing (sale of bonds or stocks). The manufacturer's warranties and prepayment schedule must be closely examined. Although the actual price of one aircraft may be less than that of another, the total cost, taking these other factors into account, may be more. For example, one manufacturer may

require more money in the form of progress payments— payments the airline makes to the manufacturer while the aircraft is under production.

Another manufacturer's total costs may involve higher start-up costs. Consequently, it is important for the corporate planning department, working with finance and property people, to examine the cumulative capital investment requirements thoroughly.

The availability of new aircraft is another important consideration. The manufacturers, not wanting to experience the same tremendous layoffs that occurred back in the early 1970s when they were geared up to turn out a considerable number of the early wide-bodies, have chosen to spread out their production and add names to a waiting list that might extend to three years for some aircraft.

Airlines must also consider the possibility of trade-ins and compare the potential advantage of leasing versus purchase. The option of purchasing used aircraft cannot be overlooked. Finally, consideration must be given to any tax benefits if the decision is between a new and a used aircraft.

Operating Economics. Operating economics is perhaps the most difficult area to evaluate. It includes the potential aircraft's contribution to the company's profitability.Revenue potential and direct operating costs in terms of airplane miles and seat-miles must be examined. However, these items depend on and are related to a number of other factors, including the carrier's route structure, traffic flow and composition, existing traffic volumes, potential future growth, seating density, load factors, and utilization. Caution must be exercised, because there is really no one direct operating cost per seat-mile. For a particular aircraft, operating costs will vary with range. Furthermore, although the airplane under consideration might have a low direct operating cost per seat-mile, the seats must be filled with paying passengers for the airline to experience the low cost per mile. Consequently, the wide-bodies, with their higher seating capacities, are normally scheduled on high-density routes.

Flight crew expenses and fuel costs represent a significant portion of direct operating expenses, and the new-generation aircraft (Boeing 757 and 767, A-300, A-310, A-320, and MD-80) were built with this in mind. The 757, with its 2-plus-2 concept (two pilots and two power plants), represents a 22 percent improvement in direct operating cost over the727, which utilizes a crew of three and three engines. A fully loaded 757 is 42 percent more fuel-effiicient than a fully loaded 727.

Tentative Fleet Planning and Financial Evaluation

After the aircraft evaluation, corporate planning prepares a projected earnings statement and cash flow for the expanded fleet. Then it makes recommendations for specific aircraft additions to and retirements from the fleet over a given time period, generally up to 10 years. Included with the recommendations is an order-option-plan mix. Orders include proposed firm orders; options (to purchase) permit the acquisition of relatively favorable delivery positions but provide flexibility to meet changing circumstances. Options enable the carrier to change its plans without as severe

a financial penalty as might otherwise be the case in the event that the option is cancelled. Plan aircraft are long-range future aircraft acquisitions that permit activation of long-lead-time items, such as facility renovations, while permitting further study of shorter-lead-time elements. Also included with the recommendations are a forecast of new funds to support the fleet purchase and a preliminary appraisal of the alternative methods of financing (equity, debt, lease, mix).

Presentation and Management Approval

Progress reviews are done periodically during the fleet-planning process, which not only ensures the full input of management's views but also minimizes the amount of new material to be covered during the final presentation. Major capital commitments normally must be cleared by the board of directors. Upon approval of the plan (in adjusted form if necessary), negotiations with the manufacturers and finance community move into their final phases. The fleet plan also becomes a key source of other planning data, including personnel and facilities.

THE DECISION TO UPGRADE OR REPLACE

In late 1995, a major U.S. carrier faced the problem of how to replace its fleet of older, late-1960s and 1970s vintage twin jets with newer, more efficient, and more noise compliant 110-seat jets. A number of factors unique to that airline were influencing its fleet decision making. The aircraft in question, a fleet of DC-9-30s, were operating largely on short segments, averaging 500 miles. The nature of these routes was twofold. First, the point-to-point service portion of the route was highly competitive, even hypercompetitive.

Fares were determined by intense competitive pressure, and therefore, setting fares was largely outside the control of the airline. Second, a portion of the traffic represented highly valuable feed between the origination point and major hubs, where it would interconnect with longer-haul, less competitive, and higher-profit service provided by the airline beyond the hub. Although the connecting, or feeder, traffic was viewed as having strategic importance to the airline, overall, profit margins on the routes were very thin.

The airline also had to begin replacing the DC-9-30s because they did not meet Stage III noise compliance standards. The DC-9s could be replaced with newer, noise-compliant model(s) or, alternatively, be retrofitted with hushkit devices that would bring the aircraft into compliance with the more stringent noise regulations. If the engine retrofit were performed, the airline could also, at additional investment, perform a number of heavy maintenance procedures to refurbish the aircraft and extend their useful life. Included in this work could be a major cosmetic overhaul, replacing the seats, galleys, sanitation facilities, and passenger comfort items, which would create the impression of a new aircraft from a passenger's perspective. The total investment was estimated at about $5 million, in addition to the airline's existing book investment of less than $1 million. Retrofitted and refurbished, the fleet of DC-9s would be certified for more than 100,000 lifetime cycles (a cycle is one takeoff and landing). Because the fleet had, on average, an age of about 50,000 cycles and an estimated use of 2,900 cycles per

year, these refurbished aircraft conceivably could operate another 8 to 12 years. The downside included higher and harder-to-forecast maintenance expenses compared with new aircraft and the adverse impact of higher fuel prices (translated into higher fuel expenses), because the older, now hushkitted aircraft would burn more fuel than a new model.

The airline narrowed its choice of replacement new aircraft to a single alternative, and then it began, with the assistance of an outside consultant, to choose between replacement or retrofit. In this analysis, the data were compared on a cost per block hour basis; because the aircraft were operated on numerous and varied routes, a route-by-route comparison was not appropriate.

The DC-9s had close to a 20 percent operating cost disadvantage ($1,450 versus $1,200 operating cost per block hour) compared with the new aircraft. However, the estimated capital cost per block hour favored the DC-9s ($400 versus $1,100 capital cost per block hour). The DC-9s also had a much lower ownership cost compared with the new aircraft, which cost four times as much. The net overall cost per block hour was nearly 20 percent lower for the old aircraft versus the new because the capital or ownership costs were less than half the new aircraft's cost on a block hour basis.

The original description of the routes on which these aircraft operate noted that the operating margins are very thin. The airline concluded that, whatever its long-term needs might prove to be (the implication being that the retrofit represented only an intermediate-term solution), the basic economics of these hypercompetitive routes would not support new aircraft with an overall block hour cost much higher than the estimated block hour costs of the refurbished DC-9s. The difference for the airline means literally flying or not flying the routes.

There are some tradeoffs and risks involved. The most important risk is the likelihood that some of the operating expense components may differ in actual experience, compared with the forecasted assumptions made in the analysis. Fuel remains a real vulnerability, although in this case the airline concluded that fuel prices would need to rise sharply and remain high over a sustained period to offset the ownership cost differential. Maintenance also remains a vulnerability; however, the airline's experience with the aircraft (in its fleet for nearly a quarter of a century) enables it to have an adequate level of confidence in the aircraft's maintenance requirements. There always remains the risk of a major price/ performance breakthrough in similar new-manufacture aircraft development. This is actually the largest risk in the analysis. However, the payback period on the retrofit is so short (about three and one-half years) that the attractiveness of refurbished aircraft is hard to resist. It is important in all of the analyses to distinguish between efficiency and the cost of necessary levels of efficiency.

Even today, many valuation methods would give little credence to this particular aircraft because they often fail to take into account the value-in-use or revenue-generating capacity of a specific type of aircraft, with specific operating economics, operating on a specific mission. It is the specificity of the fit, the definition within context, that gives rise to value. Obviously, not every aircraft and every mission shows similar results. Also, the economics of one aircraft size cannot necessarily be extrapolated to other classes of jets.

MODULE IV

GLOBAL TRENDS IN AIRLINE MANAGEMENT

REGULATORY BODIES FOR AIRLINE MANAGEMENT

INTERNATIONAL AIR TRANSPORT ASSOCIATION

The **International Air Transport Association** (**IATA**)is the trade association for the world's airlines. It represents some 240 airlines or more than 80% of total air traffic. IATA supports airline activity and helps formulate industry policy and standards. It is headquartered in Montreal, Canada with Executive Offices in Geneva, Switzerland.

History

IATA was formed in April 1945 in Havana, Cuba. It is the successor to the International Air Traffic Association, which was formed in 1919 at The Hague, Netherlands. At its founding, IATA consisted of 57 airlines from 31 countries. Much of IATA's early work was technical and it provided input to the newly-created International Civil Aviation Organization (ICAO), which was reflected in the annexes of the Chicago Convention, the international treaty that still governs the conduct of international air transport today.

The Chicago Convention couldn't resolve the issue of who flies where, however, and this has resulted in the thousands of bilaterals in existence today. The benchmark standard for the early bilaterals was the 1946 United States-United Kingdom Bermuda Agreement.

IATA was also charged by the governments with setting a coherent fare structure that avoided cut-throat competition but also looked after the interests of the consumer. The first Traffic Conference was held in 1947 in Rio de Janeiro and reached unanimous agreement on some 400 resolutions.

Aviation grew rapidly over the following decades and IATA's work duly expanded. It transformed its trade association activities to take account of the new dynamics in aviation, which was seeing increasing demand from the leisure sector. Price flexibility became increasingly important and the United States led the way into deregulation in 1978. IATA has cemented its position as the voice of the aviation industry in recent years, launching a number of important programs and lobbying governments in the wake of successive crises.

Priorities

Safety

Safety is the number one priority for IATA. The main instrument for safety is the IATA Operational Safety Audit (IOSA) and its successor, Enhanced IOSA. IOSA has also been mandated at the state level by several countries. In 2012, aviation posted its safest year ever. The global Western-built jet accident rate (measured in hull losses per million flights of Western-built jets) was 0.20, the equivalent of one accident every 5 million flights. Future improvements will be founded on data sharing with a database fed by a multitude of sources and housed by the Global Safety Information Center.

Security

Security has become increasingly important following the tragedy of 9/11. Following a series of uncoordinated rules by different countries, the industry has developed a Checkpoint of the Future, which is based on risk assessment and passenger differentiation.

Simplifying the Business

'Simplifying the Business' was launched in 2004. This initiative has introduced a number of crucial concepts to passenger travel, including the electronic ticketand the bar coded boarding pass. Many other innovations are being established as part of the Fast Travel initiative, including a range of self-service baggage options.

A new program that has drawn plenty of interest is New Distribution Capability. This will replace the old EDIFACT messaging standard that is still the basis of the global distribution system /travel agent channel and replace it with an XML standard. This will enable the same choices to be offered to high street travel shoppers as are offered to those who book directly through airline websites. A filing with the US Department of Transportation brought over 400 comments.

Environment

IATA members and all industry stakeholders have agreed to three sequential environmental goals:

1. An average improvement in fuel efficiency of 1.5% per annum from 2009 through 2020
2. A cap on net carbon emissions from aviation from 2020 (carbon-neutral growth)
3. A 50% reduction in net aviation carbon emissions by 2050 relative to 2005 levels.

At the 69th IATA AGM in Cape Town, South Africa, members overwhelmingly endorsed a resolution on "Implementation of the Aviation Carbon-Neutral Growth (CNG2020) Strategy."

The resolution provides governments with a set of principles on how governments could:

- Establish procedures for a single market-based measure (MBM)
- Integrate a single MBM as part of an overall package of measures to achieve CNG2020

IATA member airlines agreed that a single mandatory carbon offsetting scheme would be the simplest and most effective option for an MBM.

Services

IATA provides consulting and training services in many areas crucial to aviation.

Travel Agent accreditation is available for travel professionals. Full accreditation allows agents to sell tickets on behalf of all IATA member airlines. Cargo Agent accreditation is a similar program. IATA also runs the Billing and Settlement Plan, which is a $300 billion-plus financial system that looks after airline money.

And it provides a number of business intelligence publications and services. Training covers all aspects of aviation and ranges from beginner courses through to senior management courses.

Role of IATA

The key role played by IATA is the promotion of a safe, regular and economic air transport mechanism that suites the needs of the entire global customer pool. Currently, IATA represents about 230 airlines which contribute to about 93% of the global scheduled flights. IATA is an acronym for International Air Transport Association.

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO)

The International Civil Aviation Organization (ICAO), is a specialized agency of the United Nations. It codifies the principles and techniques of international air navigation and fosters the planning and development of international air transport to ensure safe and orderly growth. The ICAO Council adopts standards and recommended practices concerning air navigation, its infrastructure, flight inspection, prevention of unlawful interference, and facilitation of border-crossing procedures for international civil aviation. ICAO defines the protocols for air accident investigation followed by transport safety authorities in countries signatory to the Convention on International Civil Aviation(*Chicago Convention*).

The Air Navigation Commission (ANC) is the technical body within ICAO. The Commission is composed of 19 Commissioners, nominated by the ICAO's contracting states, and appointed by the ICAO Council. Commissioners serve as independent experts, who although nominated by their states, do not serve as state or political representatives. The development of Aviation Standards and Recommended Practices is done under the direction of the ANC through the formal process of ICAO Panels. Once approved by the Commission, standards are sent to the Council, the political body of ICAO, for consultation and coordination with the Member States before final adoption.

ICAO should not be confused with the International Air Transport Association (IATA), a trade organization for airlines, also headquartered in Montreal, or with the Civil Air Navigation Services Organisation (CANSO), an organization for Air Navigation Service Providers (ANSPs) with its headquarters at Amsterdam Airport Schiphol in the Netherlands. These are trade associations representing specific aviation interests, whereas ICAO is a body of the United Nations.

The forerunner to ICAO was the **International Commission for Air Navigation** (ICAN). It held its first convention in 1903 in Berlin, Germany but no agreements were reached among the eight countries that attended. At the second convention in 1906, also held in Berlin, 27 countries attended. The third convention, held in London in 1912 allocated the first radio callsigns for use by aircraft. ICAN continued to operate until 1945.Fifty-two countries signed the Convention on International Civil Aviation, also known as the Chicago Convention, in Chicago, Illinois, on 7 December 1944. Under its terms, a **Provisional International Civil Aviation Organization** (PICAO) was to be established, to be replaced in turn by a permanent organization when 26 countries ratified the convention. Accordingly, PICAO began operating on 6 June 1945, replacing ICAN. The 26th country ratified the Convention on 5 March 1947 and, consequently PICAO was disestablished on 4 April 1947 and replaced by ICAO, which began operations the same day. In October 1947, ICAO became an agency of the United Nations linked to the United Nations Economic and Social Council (ECOSOC).

ICAO'S ACTIVITIES ACROSS THE SUSTAINABLE DEVELOPMENT AGENDA

Sustainable development seeks to secure the well-being of present and future generations by striving for a balance among social, economic and environmental objectives. The three pillars of sustainable development are especially relevant to the international aviation sector that, by offering a safe and efficient means of mass transportation, is universally recognized as an essential component of the global economy and universal social progress.

Social & Economic Pillars

Air transport is committed to meeting its for sustainable development, maximising its support for economic development, reducing its impact on the environment and consolidating its social benefits.

Through the increased use of low-carbon technology, environmentally friendly materials, new aircraft systems and sustainable energy sources, the air transport sector is making significant advances across a range of sustainability issues. It does so by making sure that its actions around the world are based on the economic, environmental and social pillars of sustainable development.

This can be illustrated by the complex and growing network of around 1,000 airlines offering scheduled services connecting 3,850 commercial airports worldwide. They link major and minor city pairs, facilitating the movement of people, goods and services.

From fresh fish to diamonds, aviation underpins nearly every aspect of modern life, carrying 35% of goods by value and supporting 3.5% of global GDP. Other, less evident benefits of aviation include: 1) critical transportation and logistical links to hinterlands, islands and remote communities; 2) essential services, such as healthcare, mail, education; 3) emergency aid and humanitarian assistance and; 4) data collection for scientific research and meteorology.

Environment Pillar

As early as the 1970s, ICAO emphasized the value of a globally harmonized approach to addressing the impact of air transport operations on noise and local air quality around airports, then focusing its attention on the much broader challenge of climate change. It addressed those challenges through a series of activities described below.

Technology & Operations

ICAO global standards were adopted in the past for noise and local air quality (CO / NOx / HC) and a new standard for CO2 emissions is expected in 2013.

Aircraft today are 70% more fuel-efficient and 75% quieter than they were four decades ago.

New double-decker and composite aircraft that have recently entered into service have raised the bar even higher in terms of design and performance. Operational measures have also resulted in significant enroute savings in fuel consumption, through new procedures and technology adopted by air navigation service providers. ICAO's Committee on Aviation Environmental Protection

(CAEP) continues to develop guidance and tools to assess the environmental benefits of operational measures across the air transport system. ICAO's Fuel Savings Estimation Tool (IFSET), approved by CAEP, is intended to assist States in estimating fuel savings from operational improvements.

Coordinating International Policy

The global agreement on aviation and climate change reached at ICAO's 37th Assembly in 2010 was an important step towards a sustainable air transport future and makes international aviation the first sector to agree on a 2% annual fuel efficiency improvement, while stabilizing its global CO2 emissions at 2020 levels – with carbon neutral growth from 2020. It provides a concrete framework for ICAO and its member States, in collaboration with the air transport industry, to continue to identify and pursue global solutions to address GHG emissions from international aviation. With this objective in mind, in addition to its technical and operational work, ICAO is focusing on four key areas:

- State action plans.
- Sustainable alternative fuels for aviation.
- Market-based Measures (MBMs).
- Global aspirational goals.

State Action Plans

Member States have agreed to develop national Action Plans to reduce emissions from international aviation and submit them to ICAO by June 2012. The action plans allow States to identify a basket of measures tailored to their circumstances and assistance needs.

They also enable ICAO to assess progress in achieving the global aspirational goals adopted by the Assembly and to identify and address the specific assistance needs of States. Comprehensive guidance material and a web-based interface have been developed and six hands-on training workshops were held in 2011 to assist focal points nominated by States in the preparation and submission of their Plans. To date, ICAO has trained more than 200 representatives from 81 States representing 92.4% of global revenue tonne-kilometres.

International Air Transport and Its Regulations

The Basic Features of International Air Transportation

Historical perspective: Air transport has always been seen to have an inherently strategic role. It has obvious direct military applications, but it is also highly visible and, for a period, and in some countries still, was seen as Historical"flag carrier", a symbol of international commercial presence. From its earliest days, airlines were seen as having potential for providing high-speed mail services, and subsequently medium and long-term passenger transport. Technology now allows the carriage of much larger cargo pay-loads in a more reliable way. These strategic functions were used to pursue internal national policies of social, political, and economic integration within large countries such as Canada, the US, and Australia, but also took on international significance from the 1930s within the Imperial geopolitical systems centered mainly on the UK, France, Germany, and other European countries when technology allowed for intercontinental services to be developed. 8. Air transport was highly regulated and protected in

this environment with the intention of it being used as a lever for larger political and economic objectives. But even in these roles, its importance, largely because of the technology until after World War II, was small. British Imperial Airways, for example, only carried about 50,000 passengers to the colonies in the 1930s; a figure hidden in the public media coverage given to the importance of colonial air networks. Technology shifts as an offshoot of military developments in World War II changed this with the introduction of planes with far longer ranges, faster speeds, enhanced lift, and the increasingly ability to cope with adverse weather conditions. Air traffic control, navigation, communications, and airport facilities have also improved considerably, and more recently the underlying management structure of the supplying industries has enhanced efficiency. 9. The Chicago Convention of 1944 confronted the new international potentials of civil aviation and initiated an institutional structure that laid common ground rules for bilateral air service agreements (ASAs) between nationals. The result, however, while providing a formal basis for negotiation, was essentially one of protectionism with pairs of countries agreeing on which airlines could offer services between them, the fares to be changed and, often, how the revenues could be shared. Added to this, with the major exception of the US, most international airlines were state owned flag-carriers that operated to fulfill, often vague, national objectives of prestige, as well as linking colonies. Internal markets within countries were regulated in similar fashions, and it was not uncommon for wealthier countries to have an airline to provide primarily domestic and short haul services, and one for long-haul, international markets. 10. The breakdown of the domestic regulatory structure within the US from the late 1970s (Morrison, and Winston, 1995) provided both a demonstration for other countries to follow in deregulating their own domestic regimes, but also the US‟s, initially unsuccessful, initiatives from 1979 to liberalize international services on a bilateral basis based on a common “Open Skies” recipe began to bring about pressures to wider reforms. This was coupled with more generic moves towards a withdrawal of government in market-oriented countries such as New Zealand and the UK that saw airports and air traffic control being privatized, or at least operated on a more commercial footing. The move to a Single European Market within the EU from 1992 represented a broader trend, both in terms of the sectors and the geography involved, towards market liberalization of air transport infrastructure, as did the collapse of the Soviet economic system. Not all countries moved completely in this direction, the US for example, rather perversely, continued with its traditional, strongly socialist policy of air traffic control being a state owned, tax financed monopoly and airports, with few exceptions, being owned by local governments.

The modern industry

The modern air transport industry is thus one that increasingly operates within a liberal market context. While government controls over fares, market entry, and capacity continue in many smaller countries, they are gradually and almost universally being removed or relaxed. International controls under the bilateral ASA structure are increasingly moving towards broad Open Skies formulations, allowing free provision of services between the countries involved, although progress on open market, whereby nationality of ownership of airlines is unrestricted, is coming more slowly. The EU area3 has effectively been the largest international free market in

air transport services in the world since 1997, and this has grown as the Union has expanded geographically. The supply and operation of air transport infrastructure is also becoming more market driven with on-going privatizations of airports and air traffic control systems, or the use of franchising mechanisms to involve private capital and expertise (Button, 2008). It is also becoming more coordinated.

The air transport industry is now large – it accounts for about 1% of the GDP of both the EU and the US – and is vital in many industries such as tourism, exotics, and hi-technology5. It is an important transporter of high-value, low-bulk cargoes. International aviation moves about 40% of world trade by value, although far less in physical terms. The market is served by a diversity of carriers, some specializing in long-haul international routes and others in short-haul markets6. Table 1 offers some indication of the scale of larger airlines involved. To handle the interface between land and air transport the world's major airports have grown to handle millions of international passengers (Table 2) and tonnes of cargo7 each year, and many have been significant catalyst facilitating, in particular, the growth of modern hi-technology industries and tourism about them. In 2008, passenger air services globally link around 15,500 airports; with the fastest growth in air services over the past two decades being in the Europe-Asian Pacific markets.

ICAO and the Convention on International Civil Aviation

The Convention on International Civil Aviation (the "Chicago Convention") established certain principles and arrangements relating to civil aviation, in order that "international civil aviation may be developed in a safe and orderly manner and that international air transport services may be established on the basis of equality of opportunity and operated soundly and economically"

Originally signed on 7 December 1944 and ratified on 5 March 1947, the Chicago Convention is now in its ninth edition and currently has 190 signatories (known as "Contracting States"). The Chicago Convention established the International Civil Aviation Organisation ("ICAO") as a means of securing international co-operation and uniformity in respect of civil aviation matters. ICAO is composed of the 'Assembly' (the sovereign body made up of a representative from each contracting State), the 'Council' (the governing body made up of 36 contracting States elected by the Assembly), and the 'Secretariat' (which is divided into various administrative divisions).

Status of ICAO

The Chicago Convention provides for ICAO to have such legal capacity as may be necessary for the performance of its functions in the territory of each global Contracting State. Full juridical personality is granted to ICAO in each Contracting State, and as a specialised UN agency, in the territories of state parties to the UN Convention on Privileges and Immunities of the Specialised Agencies. As such, the body enjoys various diplomatic immunities and may bring international claims and incur responsibility. Although ICAO does not have law making powers, the ICAO Council is vested with extensive powers and duties, including international administrative and juridical functions (including in relation to dispute settlement and implementing sanctions for

default), legislative functions (including adopting and amending the "Annexes" to the Chicago Convention), and research and investigation functions (including in respect of the USAP audit programme detailed below).

SARPs

The Annexes to the Chicago Convention contain international standards and recommended practices ("SARPs"), which have a different status to the provisions of the Chicago Convention itself. A "Standard" means any specification for physical characteristics, configuration, material, performance, personnel or procedure, the uniform application of which is recognized as necessary for the safety or regularity of international air navigation and to which contracting States will conform in accordance with the Chicago Convention, and "Recommended Practices" are identically categorized, but deemed to be desirable, rather than necessary.

Annex 17 of the Chicago Convention is concerned with administrative and co-ordination aspects of, as well as with technical measures for, the protection of the security of international air transport, including by requiring each contracting State to establish its own civil aviation security programme that applies the listed SARPs. Compliance with Annex 17 is assessed through obligations to notify and periodic audits, described below.

Notification Obligations

Article 38 of the Chicago Convention states that "any State which finds it impracticable to comply in all material respects with any such international standard or procedure, or to bring its own regulations or practices into full accord with any international standard or procedure after amendment of the latter… shall give immediate notification to the International Civil Aviation Organisation of the differences between its own practice and that established by the International Standard." Once ICAO has been notified, it "shall make immediate notification to all other states of the difference which exists between one or more features of an international standard and the corresponding national practice of that State".

Annex 17 states that "Contracting States are invited to keep the Organization currently informed of any differences which may subsequently occur," (emphasis added) and "a specific request for notification of differences will be sent to Contracting States immediately after the adoption of each amendment to this Annex."

The legal obligation to notify ICAO of differences contained in Article 38 appears to refer to the differences which arise either on adoption or amendment of SARPS. The Chicago Convention does not make reference to differences arising on an ongoing basis. This is dealt with by Annex 17, which provides that contracting States are merely "invited" to inform ICAO of the differences arising on an ongoing basis.

Enforcement

Enforcement of the Chicago Convention can be initiated only by a Contracting State, and is governed by Articles 84 to 88, under which disputes relating to the "interpretation or application" of the Chicago Convention can be escalated to the ICAO Council to be decided by way of a vote (in which disputing parties may not participate). Decisions of the ICAO Council can thereafter be appealed to the International Court of Justice in the Hague or to an agreed arbitral tribunal.

Decisions of both are final and binding on the parties. If the decision of the ICAO Council is not followed by a relevant air carrier, all contracting States undertake not to allow that air carrier to fly through their airspace, and if a Contracting State does not follow a decision of the ICAO Council, its right to vote in the Assembly becomes suspended.

In practice, however, Contracting States generally shy away from invoking the dispute resolution. Often this is because of political and diplomatic considerations and/or because of the risk of retaliatory action by the other Contracting State. Indeed, it appears that ICAO has been asked to exercise its quasi-judicial dispute resolution functions on only a few occasions:

- *India v. Pakistan* (1952) - involving Pakistan's refusal to allow Indian commercial aircraft to fly over Pakistan;
- *United Kingdom v. Spain* (1969) - involving Spain's restriction of air space at Gibraltar;
- *Pakistan v. India* (1971) - involving India's refusal to allow Pakistan's commercial aircraft to fly over India;
- *Cuba v. United States* (1998) - involving the US refusal to allow Cuba's commercial aircraft to fly over the United States; and
- *United States v. Fifteen European States* (2003) - involving EU noise emission regulations.

A Contracting State may also be able to enforce its rights under the Chicago Convention through application of the international law of state responsibility.

International Cooperation and Information Sharing

Contracting States are obliged to ensure that "requests from other Contracting States for additional security measures in respect of specific flight(s) by operators of such other States are met, as far as practicable. In addition Contracting States are obliged to cooperate with each other in "the development and exchange of information concerning national civil aviation security programmes, training programmes and quality control programmes and to "establish and implement procedures to share with other Contracting States threat information that applies to the aviation security interests of those states, to the extent practicable

Annex 17 also contains several Recommended Practices concerning the sharing of information. In particular, each Contracting State should, when so requested, "share, as appropriate and consistent with its sovereignty, the results of the audit carried out by ICAO and the corrective actions taken by the audited State"(emphasis added). Also, each Contracting State should "include in each of its bilateral agreements on air transport a clause related to aviation security, taking into account the model clause developed by ICAO", and each State should, on request, make available appropriate parts of its national aviation security programme.

The Universal Security Audit Programme

The Universal Security Audit Programme ("USAP") was launched by ICAO in June 2002 to ascertain the level of implementation of Annex 17 standards in all Contracting States by conducting regular, mandatory, systematic and harmonized audits. The first cycle of audits, in which 182 audits were conducted, was completed in December 2007, and the second cycle of expanded audits, which commenced in 2008, is expected to complete in 2013.

Each ICAO audit is conducted in a transparent manner with the cooperation of the audited State. Indeed, the State will usually have four to six months notice of the audit, and will enter into a customized memorandum of understanding with ICAO that sets out the audit's scope and implications. Typically, a team of three or four ICAO auditors will conduct the audit over a period of about one week in accordance with ICAO's standard auditing procedures and protocols before providing the State concerned with a confidential audit report. Following receipt of the audit report, the State typically has 60 days to submit a "corrective action plan" detailing how it intends to rectify any deficiencies identified by the audit. The implementation of the corrective action plan is then monitored by ICAO. In 2005 a series of "follow-up visits" (172 in total) were initiated to verify compliance with corrective action plans and provide further assistance in respect of outstanding deficiencies, and according to ICAO such visits "confirmed that, overall, states made progress in the implementation of their corrective action plans". In respect of audits starting in 2011 (and some to be undertaken in 2010), ICAO will notify the State of any 'significant security concerns' ("SSeCs") within 15 days, after which the State is required to implement immediate corrective action. Failure to do so within 15 days**.**

LOW COST CARRIERS

Overview

The low cost carriers in Europe almost captured a 25% share as of now. While the first time air travelers continue to contribute to the growth of LCC, the full services conventional carriers(legacy) do not suffer any appreciable market share.

In general, what we observe in the air travel market today is a fare war ignited by low cost carriers. There is an impression fast gaining momentum that low cost carrier (LCC) means, substandard services, low in performance, low in serviceability and low even in safety standards, and the tickets are sold for a very low price or even ‘zero’ as the hidden surcharges and taxes are unknown to the traveling public, particularly the ‘first time travelers’ who in any case are the target population. It is time that the LCC re- looked at their advertising campaigns to correct the wrong impressions. First time travelers must know the clear difference between a ‘full service’ conventional airline like Emirates Airline and the LCC like Air Arabia. Travelers should be aware that low cost carrier means it will not have certain facilities or full services on board like Emirates and that is why they are low in prices, and not low in service quality. Once this clear message is communicated, then the traveling public should be able to choose the right airline. It is important to create the right impression from the very beginning, otherwise it will create a wrong impression in the mind of a first time traveler and that will spread by word of mouth. It is critical to inculcate the right perspective, as the LCC is growing fast and have a good potential to grow fast in India too.

What is a Low-Cost Carrier (LCC)

In airline business, we have a traditional model referred to as 'Legacy Carrier/Conventional' and the Low-Cost Carrier. It is essentially a 'business module' also known as 'no frills' or discount

carrier, is an airline that offers low fares but eliminates most traditional services. Legacy carriers operate with multi-class (First, Business and Economy) configuration with 'complimentary in-flt services.

'No-frills' is the term used to describe any service or product for which the non-essential features(or frills) have been removed. Common products and services for which no-frills brands exist include airlines, supermarkets, holidays, automobiles etc. They operate on the principle that if you take away the frills, you get lower prices/fares. No-frills supermarkets are recognizable by their store design and business model. They work on the principle that in most supermarkets,20% of products on sale account for 80% of what people buy and therefore, they stock the most commonly sold product, and they often do not serve branded items.

A typical Low-Cost Carrier business model practices include:

- a single type of aircraft (say, Airbus320 or 'Boeing 737)
- a single passenger class
- a simple fare scheme(typically fare increases as the aircraft fills up, which rewards early reservations-Yeild Management)
- unreserved seating (encouraging passengers to board early and quickly)
- short flights and fast turnaround times (allowing maximum utilization of aircraft)
- flying to cheaper/less congested airports
- simplified routes, mostly point-to-point
- emphasis on direct sales of tickets(on line)
- employees working in multiple roles and simple dress code
- 'Free' inflight catering and other 'complimentary' services are eliminated, and replaced by optional paid-for in-flight food and drink

LCC seek to price their fares well below those of traditional airlines to increase demand and encourage consumers to switch to the low -cost carriers. By taking advantage of their lower average seat mile costs and using the increased demand to fill a large percentage of their flights, the low-cost carriers seek to maintain profitability despite offering lower rates.
The first successful low cost carrier was Pacific South West Airlines in the US who pioneered the concept when the first flight took off on 06 May 1949. Often, this credit has been incorrectly given to South West Airlines which began service in 1971 and it has been profitable every year since 1973.. With the advent of aviation deregulation, the model spread in Europe and the most notable one being Ireland's Ryanair which began the low cost operations in 1991 and EasyJet followed it in 1995. Malaysia's Air Asia and Australia's Virgin Blue came in 2004.

Many traditional carriers tried to introduce the low cost concept by introducing an 'airline within an airline' where in the traditional airlines tried to follow the low cost concept just by introducing no frills such as KLM's Buzz, British Airways' GO Fly, and United's Ted, and most of them found it difficult to establish the low cost model. British Midland's low Cost rival bmi baby has however, successfully operated alongside its full-service counterpart. In Canada, Air

Canada found it difficult to compete with low-cost rivals such as West jet, Can jet and Jets go despite its prominent position in the market. Air Canada tried to operate two low cost subsidiaries, Tango and Zip, and both were discontinued. Whereas, Malaysia's Air Asia and Australia's Virgin Blue are some of the good models of growing LCC.

The clear message is that fare alone cannot drive an airline, though it could be one of the drivers, there has to be other factors that should join the drivers to make LCC in real terms, 'low in fares but high in service'. Look at airlines like 'Emirates', they are high on fares, superior in service quality, and doing well.

It is also wrong to presume that people look only for food and entertainment on board, more so, on short routes, the main customer concern is service with a smile and from the word go customers should have a feeling of goodwill- a hassle free environment.As the Government policy is now aimed to encourage Regional Carriers, it is obvious that more and more LCC will take off, while many more are waiting on the wings, some hesitant and frightful whether they can gain the market and be profitable. Why this uncertainty?
The objective of LCC are to woo the rail/road travelers to air travel and create a new environment for this segment of travelers so that more and more such travelers will move over creating a new wave of mass transportation- nothing but an Air Taxi operation. The carriers, planners, and airport operators should accept this concept and mutually assist each other so that air taxi operations (LCC) gain the required momentum.

It is said "strategy without tactics is the slowest route to victory." There is a need for LCC to re-look at their present strategy to ensure that the model stays on track and sustains with adequate profit margin, without indulging in fare war, and without coming on the contrails of full service model carriers. What is the way forward?

LCC- New Thrust Areas
Low-cost carriers pose a threat to traditional 'full service' airlines, since the high-cost structure of full-service carriers prevents them from competing effectively on price. Notwithstanding, LCC are to focus on new thrust areas to stay ahead.
There is a need to find a path that the low cost carriers can follow as it seeks out new markets, ways and means to attract and maintain its customers and how to compete with the market rivals. Sustained excellent performance records of LCC like SouthWest and JetBlue in US and Ryanair and EasyJet in the UK are good case studies that will help our existing LCC and the potential low cost carriers to carry out a transformational intervention. Some of the key issues that merit attention are:

Differential Strategy- Uniqueness, Features, Appearance and Perceived Customer Value are some of the factors that help to provide distinguishable marks for which the customer is willing to pay a premium. You have to be something different from your competitors. To gain such a differential strategy, you need to know the market you want to serve, the market segments, customer type, nature of customers, customer needs and their choice and the geographical area

and the product niche. You have to constantly work through the customers by way of customer surveys, close scrutiny of customer preferences, their behaviour patterns and the regional characteristics including the cultural bias. Capture these very features and introduce something new and something very different. Though it can be copied by your competitor, but you have the advantage of introducing it for the first time and thereby making it easy for you to market it, and also to bring about quick changes at frequent intervals. Pleasing, unique interiors and appearance, seating configuration, leather upholstery, soft skills of cabin crew and above all, on time performance are some of the features that can differentiate you from your competitors. You may not need to add any tangible value to the product as long as the customer perceives that the product is superior. It is the perception that matters. Perception value is more important than actual value.

Competitive Strategy- It means that a low cost model is doing something different, deliberately choosing a different set of activities than its competitors. Full service carriers serve a large number of destinations on a hub-and-spoke method, clustering around peak hours at hub airports which require coordination of schedules, interlining, extensive screening of baggage etc. Whereas, low cost operators should stay away from large, congested airports and offer only short point-to-point services between mid size cities and only to secondary airports in large cities, strategy being- keep fares low and frequency high- so that you are able to attract people who might otherwise travel by car or train.

While introducing hopping flights to attract rail/road users, it should be ensured that they do not waste their time in procedural aspects, instead, it should be straight in and they should gain an impression that air travel really saves time, it is comfortable and convenient, and at an affordable cost. Popularize the secondary airport/low cost airports concept. They are to be different to achieve the quick turnaround time with simplified security/check in procedures; one can even scrutinize the credentials of frequent fliers and high value travelers, and issue them with laminated boarding pass/e-gate facility to reduce the dwell time.

Airport operators and aviation security bureau should be able to come forward with less stringent and quicker ways to screen and even provide an exclusive area for low cost operators. Passengers can be indoctrinated to carry less baggage or just hand baggage only so as to reduce the turnaround time. Passengers with only hand baggage can even be encouraged with some incentives so that the practice gets developed. Focus on high frequency and least dwelling time.

Selection of aircraft is crucial. The tendency to go in for the easily available old aircraft or cheaper lease terms should be avoided as it can be costly in due course as they would be less fuel efficient and costly on maintenance, training of air and ground crew. Use of standard aircraft, say a fleet of Air Bus 320 or B737-800 contribute to lowering the operating costs and therefore selection of aircraft is key to the whole issue. In 2006, the cost per available seat mile for full services carrier US Airways was 12.5 cents and 9.6 cents for Continental, whereas, it was 7.0 cents for South West and 6.2 cents for Jet Blue, the low cost operators.

Operational Effectiveness- It means performing better than your competitors by keeping the operating cost lower than your competitors by performing the same activities in different ways. A strategic management approach of establishing a corporate Vision, Mission, Objectives, strategic alternatives, implementation of the set out strategies and periodical evaluation, and corrective action wherever necessary will be an effective tool to achieve the operational effectiveness. Vision or Mission says it all. Virgin Atlantic's Mission, "to grow a profitable airline, that people love to fly and where people love to work" has indeed helped the airline to market it very well.

Awareness Build Up- Most of the traveling public, particularly the first time fliers, at least 10 to 20% at any given time are ignorant of the difference between conventional full services airlines except that they are induced by the fare driving advertisements. Best fare does not always explain consumer choice in air transportation. There is a segmentation here one segment is leisure passengers and the other business passengers. While price may rank high in the case of leisure passengers where elasticity of demand is high, when it comes to business travel, demand level is inelastic and depends mostly on convenient schedule than fare. Another factor is passengers may end up paying a higher fare than they would probably because they use a medium to make their reservation that does not have an account to the lowest possible fare. Use of inter net and on-line booking makes it cheaper than booking through a travel agent or direct booking over a telephone. One may choose an airline due to pre-conceived perception of preferred ground services, or safety record or on time performance, or cultural preferences, and therefore, understanding the consumer behaviour is extremely important in establishing a competitive position.

Low Cost Leadership- A low cost leader has two options one, to provide a service at lower fare than its competitors and thereby gaining a large share of market place. In this, the low cost leader is undercutting the competition. If the buyer is cost sensitive, then the buyer will choose the low cost leader. The second option for the low cost leader is to offer the same fares as that of the competitors. In this case, the leader reaps the benefit of a greater profit margin. The leader by virtue of being the leader has been able to keep the cost lower than rivals, and as the costs are lower, the profit is better than rival. However, to be a leader, you should be able to provide customers with a workable schedule as well. In a price sensitive environment, the customers should also know who offers the lowest fare and convenient schedules and then choice will be the leader.

When buyers are price sensitive, low cost leadership position will have a very strong competitive position in the market. The aim is to contain the cost to the lowest, relative to industry rivals and in course to create a sustainable cost advantage over the competitor. Remember, cost is not equal to price. So, one has to gain cost advantage in a manner that is very difficult for the rival carriers to copy. Cost advantage is based totally on the relative ease or difficulty it takes to imitate the product and this is the key to sustainability of competitive edge.

Core Competence – What is your core competence, how to identify them and how to develop them are some of the questions that you need to answer. May be it is better for you to try and

identify a competency or set of competencies that helped you to do well in your business, and then it would be easy to exploit them.. We need to recognise that the competitive advantage and core competencies come from within the airline itself. It must also be borne in mind that it is not easy to identify or figure out what exactly is your core competence. It may be skills, process, and corporate identity, combination of skills and knowledge that is embedded in the organisation; because it exists you are able to reach new heights. This helps to initiate value creating activities that can make unique value added contributions to the business. The aim is that your airline should be better at the competencies than all others or at least the vast majority of your competitors. Rareness of the competency makes it difficult for your competitors to imitate you. Competency to meet your customer needs is the key. Being better than your competitor is not enough to have a sustainable competitive advantage, but the reality is to fit and focus is necessary. What make an airline in one market, may not work in another market. Your success in one market segment does not guarantee success in another market segment. It is important for you to focus on your core activities in which you want to excel. This is the reason why the introduction of 'airline with in an airline' tried by some of the major traditional airlines did not succeed. Continental tried to copy South West unsuccessfully, similarly, many others. So copying is not easy.

When the activities are incompatible, it can become confusing to customer if another type of service or value is offered, when the brand is known for one type of service or value. The new image can undermine the reputation of the parent airline (Air India Vs Air India Express). A new activity requires different skills, different equipment, management systems/style and employee attitudes. Use of same travel agents, lack of training on the part of employees while switching from legacy carrier to low cost or even after training, inertia or mind set can affect the brand image. Lack of internal coordination and control can also result out of change of roles.

- Sustainability Strategy
- Optimize operating efficiency of facilities
- Pursue cost cutting measures through procedural control
- Avoid or minimize marginal cost activities
- Maintain a close watch on the cost drivers
- Continuous innovation in areas where cost cutting can be achieved. Even the crew uniforms can be made simpler and cheaper. Introduce something to go by the regional accent and smart casuals are optional choices.
- Adaptability to market condition, where inventory can be adjusted rapidly, keeping demand and supply equation
- Quick and efficient on time performance- flexibility to respond quickly and pro-actively to changing needs of the customers
- Outsource as much as possible in areas such as finance& accounting, back office functions, reservation process, baggage screening, and resort to e-marketing, snap express reporting and build committed employees.
- Seating and all other services based on what the customers can afford to pay, what ever strategy that can boost the first time travelers' choice and cut down the costs to ensure no

seat goes unoccupied and that no space that goes vacant, it should be filled with additional seats.

- Improved revenue management system- some of the airlines have a complex fare structure. Make it user friendly and more manageable, and keep the unfamiliar first time travelers in mind.
- Function exactly as air taxi operations with e-commerce strategy.

Follow what Mr. Roller King, the founder of South West Airline, the most successful low cost carrier said "if you get your passenger to their destination when they want to get there, on time, at the lowest possible fares, and make damn sure that they have a good time doing it, people will fly your airline"

CONSOLIDATION

Airline consolidation or just plain working together on a greater scale - because on your own you struggle and possibly drown - is not new, but certainly is considered more during economic downturn. During these periods of downturn airlines tend to focus on operations and cost, during positive periods airlines focus on service and revenue.

The current economic downturn has made the aviation industry search for options for survival, one option is consolidation. More and more we see forced consolidation due to financial difficulties, wherein mergers and acquisitions are used as a last resort to survive, instead of an opportunity when all is well.

So what consolidation can we distinguish, there are operational partnerships for instance on maintenance or ground handling services, there are the commercial alliances where code sharing and common branding is applied and the financial consolidation with mergers and acquisition of the other airline. The last one is the most difficult as this involves regulation from different countries, politics, and cultural differences and more challenges facing this type of consolidation. The most common reasons for airlines to consolidate are to improve the cost base through the achievement of scale and scope related advantages, think of network expansion. Also reduce excess capacity on unsustainable competitive markets and code share on certain routes, in addition the need to increase presence in key markets and enter emerging ones.

The advantages created can be on cost reduction through economies of scale and scope, handling services, joint purchasing and shared facilities. Also the ability to grow the network is the size or the market share in an already present region - in addition the regulatory approvals for entering foreign markets could be less difficult. Next to cost and growth also the customer benefits can improve through joint check-ins, greater choice in destinations and maybe the sharing of loyalty programs.

The disadvantages of consolidation some time out way the benefits in this the aviation industry doesn't differ from other industries. Cost reduction is one of the first aspects that are covered during consolidation, the easiest cost reduction is of course the reduction of staffing, but

performing this badly can harm the company more than is intended. The combination of two parties working together can bring the needed synergy but also can cause conflicts and tension between the two workforces, example is Air France KLM. Taking it a step further to a full merger or acquisition, the question remains who is determining the strategy for both companies? And who takes the responsibility when things go sideways?

This can result in long consolidation processes that are expensive and won't bring the needed synergy in the short run. It's important to have the same goals but even better to streamline the core processes where, but isn't the only bottleneck, cross-border mergers come with their own cultural differences, without tackling these issues you are in for the long run or very short. Further issues can be on strategy, different union involvements, branding, licences/IPR, bilateral agreements, IT and service standards.

If that isn't enough there are obstructions to consider, like regional responsibility and EC regulations about pricing and "unfair" competition. Currently the consolidation is directing towards alliances, wherein large carriers like Air France-KLM, Lufthansa, British Airways, Singapore airlines and more of these large flag carriers are consolidating services and dividing capacity via code sharing.

But these alliances will go further; the current alliances are Sky Team , One World and Star Alliance. Sky Team also has a Sky Team cargo that joins the cargo operations. These alliances can be successful because, they search for the best network match and cost structure, catch growth opportunities to consolidate presence on key neighbouring markets, consolidate the global network and divide capacity and fleet mix accordingly.
For an alliance to remain successful they need to:

- Focus on core business activities; passengers/cargo operations
- Improve pricing structure; ticket selling procedure
- Adapt to the current and future market; without the flexibility this will form a threat to future success
- Maximize synergy in aligning ways of work, processes and procedures; together the total must be more than the sum of the parts
- Even when all is well, focus on operations and cost

The alliances will only grow and aircraft probably will fly with alliance colours instead of the original colors of the carrier, this also would increase the opportunity for predatory pricing among the alliance members and thus making it very difficult for new entries or not alliance members to come to the market. The movement of large scale partnerships within the alliances, is already happening, wherein joined purchasing, management, crew planning, crew training, maintenance and so on is true for certain alliances partners. As long as the legacy carriers stick to their hub operations there is still room for LCCs, charters or hybrid airline business models. In conclusion the alliances as a whole are hybrid airline business model, similar like a large company with different departments operating in different ways, with different systems and

different cultures. To survive they have to simplify, streamline, couple, control cost and increase efficiency over the whole range of different airlines, just plain work together.

BILATERAL AIR TRANSPORT AGREEMENTS: AN OVERVIEW

Introduction

A bilateral regulation is a regulation undertaken jointly by two parties or, most typically by two states in international civil aviation. The main objective of bilateral agreement is the conclusion, implementation or continuance of some kind of intergovernmental agreement or understanding concerning air services between the territories of the two parties. A significant amount of intergovernmental bilateral regulatory activity involves formal consultations undertaken to conclude, interpret, expand or amend, or resolve a dispute under an intergovernmental agreement, arrangement or understanding concerning international air services. Unlike national and multilateral regulation, the bilateral regulation of international air transport has no organizational structure. However, it does have an extensive legal regulatory structure composed of several thousand bilateral agreements and understandings.

Evolution of the Bilateral Regulations

Although international air transport services were first developed in the early 1920s, few bilateral intergovernmental agreements were concluded in those early decades due to the small volume of international air transport activities and then to the virtual cessations of many commercial flights during the 1939-1945 (World War I) period. Bilateral agreements now inforce, largely date from after the 1944 Chicago Convention.

Why Bilateral Agreements?

a) Article 1 of the Chicago Convention which states that states have complete and exclusive sovereignty over above their territory.
b) Agreement on the requirement for special permission or other authorization to operate schedule international air services over or into the territory of a contracting state.
c) Lack of success of efforts to establish a multilateral regulatory regime for the commercial aspects of international air transport.

The Bermuda I Agreement of 1946 between UK &USA

This agreement was the result of a compromise between the two broad approaches to the regulation of international air services that had emerged at the Chicago Conference and been let unresolved.

i) At one extreme it was held that there should be no regulation of capacity or tariffs nor narrow definitions of routes.

ii) The opposite view was that capacity should be pre-determined, tariffs regulated by an international agency and routes specified.

iii) Under the compromise agreement, tariffs were to be established by the Airlines through IATA, subject to the approval of both parties. Capacity was to be determined by the Airlines and routes were specified.

TYPICAL PROVISIONS OF BILATERAL AIR TRANSPORT (SERVICES) AGREEMENTS

1. The **Preamble**, which is the initial part of the agreement, identifies the **contracting parties** or simply **parties** (the two involved governments), presents their reasons for entering into the agreement, and declares that they have agreed to what will follow in subsequent parts of the agreement.
2. A **definitions article**, often the first article of the agreement, assigns meanings for the purposes of that agreement to terms used in the text, typically those used more than once.
3. A **grant of rights article** expresses the main purpose of the agreement, that of the grant by each contracting party to the other contracting party of rights specified in that article or elsewhere, such as in the Route Schedule(s), to operate the agreed air services.
4. A **fair and equal opportunity article** (or some variant thereof such as "fair and equitable" or "fair") sets forth a general principle which each party to an agreement may rely upon to ensure against discrimination or unfair competitive practices affecting its designated carrier(s). Alternatively, the principle may be stated in a clause in the capacity article or elsewhere in the agreement. The article is sometimes expanded to specifically require consideration of the interests of the other party and its air carrier(s). The opportunity provided is for the designated carrier(s) of each party and may be stated as "to compete" or "to operate."
5. A **designation and authorization article** grants the right to name an air carrier, or more than one air carrier, to operate the agreed services and establishes the limited conditions under which the other party may deny an operating authorization to such carrier(s). The conditions for denying (including withholding) of an operating authorization are typically those of substantial ownership and effective control not being vested in the designating party or in its nationals, and/or an insufficient disposition to conform to the laws and regulations of the receiving party and/or an inability to meet airworthiness standards.
6. A **revocation or suspension of operating authorization article** grants each party a right to revoke or suspend the operating authorization already granted to an air carrier of the other party if the carrier no longer meets a specified condition, usually one of the same conditions established for the grant of such authorization.
7. A **capacity article** lays down the agreed principles or method for regulation of the amount(s) of services offered or to be offered under the agreement. Detailed models of a pre-determination type capacity article, a Bermuda I type capacity article, and a free-determination type article were developed by ICAO to provide guidance on three alternative regulatory approaches to capacity clauses and may be found in ICAO Doc 9587.

8. A **tariff article** establishes procedures for the establishment and regulations of prices on the agreed air services. Detailed models of a double approval clause, a country of origin clause and a dual disapproval clause were developed by ICAO to provide guidance on three alternative regulatory approaches to tariff clauses or articles and may be found in ICAO Doc 9587, along with discussion of further alternative approaches to tariff regulation, such as "tariff zone" and "country of designation."
9. A **statistics article** typically provides for exchange of airline traffic data related to the agreed services, either periodically or as needed for the regulation of capacity, for route evaluations, or for other purposes.
10. A **Commercial operations article** or **commercial opportunities article** (or articles) specifies the rights granted to each party's designated air carries(s) to carry out commercial activities in the territory of the other party. These rights are sometimes referred to as "**doing business rights**"or "**soft rights**" and are likely to include the establishment and extent of foreign staffing of airline offices, sales in local or convertible currency, ground handling options, currency conversion and remittance of funds by airlines, and in some cases, access to landing and take-off slots at airports and/or use of computer reservation systems (CRS). **An airport slots article** and/or **a computer reservation systems article** are sometimes used to cover the latter two "soft rights" separately.

    "**Hard rights**"has come into some use as a collective term of contrast to include route, traffic, operational and capacity rights which are considered more valuable and enduring, hence "hard". Pricing rights are sometimes in the other. In some agreements, one or more of the "doing business rights" listed above are given their own distinct articles.
11. An **airworthiness article** typically provides for the mutual recognition by the parties of each other's certificates of airworthiness, certificates of competency and licences.
12. An **aviation security article**, an addition in recent years to many bilateral air transport agreements, sets forth procedures for co-operation between the parties to avoid or deal with situations involving acts or trreats of unlawful interference with the security of civil aviation. In 1996 the Council of ICAO adopted a model bilateral aviation security clause for the use of Contracting States (see Appendix I to the manual).
13. A **customs duties and taxes article** requires each party to exempt from duties, taxes and charges, the aircraft fuel, spare parts and supplies used by the other party's air carrier(s) (see also ICAO's Policies on Taxation in the Filed of International Air Transport, Doc 8632).
14. A **taxation article** (in the absence of a separate tax agreement) exempts from taxation the corporate earnings of the air carriers(s) of the other party and may, in some cases, extend to cover the earned incomes of air carrier employees (see also ICAO Doc 8632).
15. A **user charges article** sets forth agreed principles regarding charges for the use of airports and route air navigation facilities by the designated air carrier(s) of the other party(see Statements by the Council to Contracting States on Charges for Airports and Air Navigation Services, ICAO Doc 9082).

16. An **application of laws article** establishes that the national laws of one party related to the operation, navigation, and admission and departure of aircraft apply to the air carriers(s) of the other party.
17. A **consultation article** sets forth the agreed procedures for consultation between the parties or their aeronautical authorities (often with a time requirement for the consultation to take place) and may include an **amendment clause** (sometimes a separate **amendment article**) which establishes procedures for amending or modifying the agreement.
18. A **settlement of disputes article** sets forth agreed measures for resolving disputes between the parties. Such measures routinely include consultation and sometimes arbitration.
19. A **termination article or denunciation article** specifies how a party may end its commitments under the agreement, typically one year after receipt by the other party of a formal notice to that effect. Some agreements provide for a shorter notice period, such as six months, or in exceptional cases, allow for denunciation or termination of only parts of the agreement.
20. A **multilateral agreement article** provides that if a multilateral agreement accepted by both parties, concerning any matter covered by the agreement, enters into force, the agreement shall be amended so as to conform with the provisions of the multilateral agreement.
21. A **registration article** reiterates the obligations of the contracting parties (when both are Contracting States of ICAO) to register the agreement with ICAO, as required under Articles 81 and 83 of the Chicago Convention.
22. An **entry into force article** establishes how and when the agreement will take effect, typically upon the conclusion of an exchange of diplomatic notes. It may specify provisional effectiveness and may or may not anticipate a process of ratification by either or both parties.
23. The **signature provisions** at the end of the agreement indicate the date and place of signature and specify the language versions. Although most agreements having more than one language version provide that each version is equally authentic, agreements can provide that in the event of conflict between the language versions, the text of one specified language will prevail.

EMERGING TRENDS IN CIVIL AVIATION- ISSUES RELATED TO BILATERAL AND OPEN SKIESTRAFFIC RIGHT

Bilateral agreements and open skies have a direct relationship with air traffic rights. In the context of civil aviation, traffic right means the right granted to an airline operator to land its aircraft at an airport. It is a market access right granted by a government or regulatory authority established by the government for use by a designated carrier over an authorized route. It is the right to transport passengers, cargo, and mail, separately or in any combination. Traffic right encompasses revenue traffic and certain non-revenue traffic, such as the carrier's cargo or mail. Traffic rights can also be for non-traffic purposes or technical reasons, such as fuelling, change

of crew, lifting of food or even some repair work. The traffic right of an airline operator could be for international operations or domestic operations or both.

The need for grant of traffic rights in international air transport has arisen due to inherent sovereign rights of the States over the air space above their respective territories and as such the imperative requirement for an agreement between two or more States for grant of traffic right for any international flight. The Convention on International Civil Aviation (commonly called the Chicago Convention) in Article 1 recognizes this sovereign right. At the time of Chicago Convention in 1944, an attempt was made to globalize the traffic rights through a multilateral agreement but this effort failed. The primary reason for this failure was the fear of a large number of States, especially developing ones, that their air carriers, mostly owned by the governments, will not be able to stand the competitive powers of the mega carriers of the developed world, mainly because of economies of scale. Subsequently, in various international forums the difference in the approaches of developed and developing world in this regard has been clearly observed. The traffic right is often considered to be of commercial value and an intangible asset which should not be passed on easily without obtaining reciprocal benefits. Sometimes, the grant of traffic right becomes a part of country's foreign policy.

The issues connected with grant of traffic rights for international operations are complex because two or more operators from different countries are involved and governments or regulatory authorities from these countries have to come to an agreement regarding the extent of grant of traffic rights, which has to be mainly on reciprocal basis. In international operations, traffic rights can take several forms depending upon the type of operation. On the other hand, the issues connected with traffic rights for domestic operations are relatively simple as there are only two involved parties, airline operator and the regulatory authority, which is the government or an entity established by the government. Traffic rights for domestic operations are not given to foreign carriers either under the bilateral agreement or open skies.

Globally, the most basic way the international traffic rights are expressed is one of the freedoms of air. While International Civil Aviation Organization (ICAO) has formally recognized only five freedoms of air, in actual practice other freedoms of air have gradually evolved. According to the ICAO Manual on the Regulation of International Air Transport, there are presently nine freedoms of air denoting different types of traffic rights, which are detailed in the Appendix. These freedoms are not automatic but have to be exchanged after detailed negotiations between the concerned States except for the rights relating to first and second freedoms, which are covered by a separate multilateral agreement discussed in the following section. Moreover, the freedoms of air could be subject to other restrictions such as number and capacity of aircraft to be operated, choice of routes and airports, time slots for landing, charges for landing, etc.

International Practices and Recent Developments

Globally, civil aviation is undergoing technological advances in several areas which have direct and indirect impact on bilateral agreements. These include: increase in the size of aircraft, higher speed, greater safety, more comfort and convenience and all these at reduced fares in real terms

because of increased productivity and competition. The recent emergence of no-frill airlines is making a dent in the traffic handled by rail and road and providing effective competition to them. Present day airports provide much improved facilities to the users than in the past. Apart from a significant surge in air traffic and technological advances, the last one and half decades have seen manifold changes in the management, operation and regulation of the aviation industry in most parts of the world. A major supporting development for the aviation industry has been the globalization and liberalization of economies and an increasingly active role for the private sector in the economic development of the countries. These economic changes have brought about structural changes in civil aviation throughout the world and also in the approach towards bilateral agreements and open skies.

In 1944, the international aviation community and representatives of the States organized a major international conference in Chicago to consider regulation of international air transport with a view to developing and ensuring safe, secure, efficient and economical international air transport services and to avoid arbitrary action of the States which could hinder such development and also to establish standards to maintain safety and security of international operations. This conference culminated in signing of three major agreements.

The first agreement was the Convention on International Civil Aviation (the Chicago Convention) to which presently 190 States, including India, are signatories. This Convention established the International Civil Aviation Organization and the primary basis for the regulation and development of international air transport. The provisions of the Convention are binding on all the Contracting States. The ICAO has a General Assembly which meets at least every three years. It has also a permanent governing Council with 36 members of which India is a member.
The second agreement was International Air Services Transit Agreement which provided for the multilateral exchange of first two rights of freedom, namely (a) over-flight (the privilege to fly across the territory of other contracting States without landing) and (b) non-traffic stop for scheduled air services among its contracting States (the privilege to land for non-traffic purposes). As many as 122 States, including India, have ratified this agreement. This agreement applies to only those States which have ratified it.

The third agreement was International Air Transport Agreement for grant of the right to first five freedoms of air. This agreement was to have far reaching consequences in liberalizing international air transport operation and grant of traffic rights. However, only 19 States (out of which eight States, including the United States which later withdrew) could ratify this agreement. Thus, this agreement is of no practical value for international air transport. India is not a signatory to this agreement. Had this agreement been ratified by the States, the shape of international air transport would have been different from that it is today. There would have been almost no place for bilateral or regional agreements.

Birth of Bilateral Air Services Agreements

The lack of success in 1944 of the efforts by the international aviation community to establish a multilateral regulatory regime for the commercial aspects of international air transport led the

States to control and regulate international air transport within their territories. This resulted in the global development of bilateral air services agreements to regulate international air transport between any two States. Today, such agreements constitute the largest volume of international air transport regulatory documents. Presently, bilateral air services agreement is the primary basis for most of international air transport operations.

Each bilateral air services agreement is unique in nature. The key element of the agreement is determining the basis for sharing of perceived future traffic between the two countries and sometimes beyond. Sharing of traffic is essentially based upon the policy of equal opportunity for both the States in grant of traffic rights. Sometimes, political considerations do play a part in deciding the allocation of landing rights but such cases are exceptional. The bilateral agreements have several other provisions most of which, while not identical, have a similar thrust. Such commonly found substantive provisions include: recognition of sovereignty, airline ownership, designation of air carrier and authorization, fixation of tariffs, exchange of traffic statistics, right to carry on commercial activities in the territory of the other party, mutual recognition by the parties of each other's certificate of airworthiness, competency and licences, procedure for cooperation regarding safety and security, use of computer reservation system, provisions regarding exemption from payment of customs duty and taxation of earnings of the air carriers, user charges, and application of national laws, etc. ICAO provides guidelines on most of these issues and in many cases on the wordings of the Articles of the agreements, but these is advisory only.

During the last decade considerable progress has been made throughout the world in liberalizing the provisions of bilateral agreements with respect to traffic rights. Such changes are still continuing. According to ICAO, between January 1995 and December 2001, over 600 bilateral agreements were reported to have been concluded or amended. About 70 percent of these agreements and amendments contained some form of liberalized arrangements, such as unrestricted traffic rights, covering Third, Fourth and in some cases Fifth Freedom rights, multiple designation with or without route limitations, free determination of capacity, etc.

MULTILATERAL AGREEMENTS

As an enlargement of the concept of bilateral agreements, some agreements negotiated in recent years have sought to liberalize air services on a regional or sub-regional basis or among a group of like minded States. These regional and/or plurilateral liberalization arrangements have the basic objective of providing greater market access and improving services among the member States concerned. Small groups of States of comparable size and development would find it easier to agree on market access than larger diverse groups of States. The smaller groups would also provide a more manageable environment to test the liberalized air transport policies. Before 1994 there were just two regional arrangements but today there are eight regional arrangements.

OPEN SKIES

Open skies strictly means right to land at any airport in a country without the need for any prior agreement and without any restrictions. Presently, no country in the world has declared

unconditional complete open skies policy. Wherever open skies policy has been accepted, either it is reciprocal, regional, periodic, or for any specific purpose. Prior permission may be required and conditions may also apply. For example, USA has entered into open skies agreement with several countries including India but almost all of them are bilateral. India is following open skies policy regarding international cargo, international tourist charters and scheduled services during peak periods without insisting on reciprocity. However, for additional scheduled flights commercial agreement with Air India is necessary. Globally, since 1992, all over the world over 90 open skies bilateral agreements were concluded, involving approximately 75 States with the United States being partners in 61 cases. These agreements permit unlimited access by airlines of the participating States to a number of airports. It may be pointed out that open skies agreements do not permit carriage of domestic passengers in the other country. Generally, open skies agreements have positive impact on air traffic.

ICAO'S APPROACH TO LIBERALIZATION

ICAO supports liberalization of air services agreements. It organized a major worldwide air transport conference in March 2003 in Montreal, Canada which was attended by 145 contracting States of ICAO including India and 26 international agencies. This was the fifth conference in the series held almost once in every decade to discuss global air transport economic issues. The basic theme of March 2003 Conference was "Challenges and Opportunities of Liberalization". The main focus of the Conference on "how to" rather than "whether to" liberalize international air transport. On the subject of liberalization of market access the following major conclusions emerged.

"Since the Worldwide Air Transport Conference in 1994, considerable progress has been made in the liberalization of market access, particularly at the bilateral, sub-regional and regional levels. More importantly, States have generally become more open and receptive towards liberalization, with many adjusting their policies and practices to meet the challenges of liberalization. "While multilateralism in commercial rights to the greatest extent possible continues to be an objective of ICAO, conditions are not ripe at this stage for a global multinational agreement for exchange of traffic rights. States should continue to pursue liberalization in this regard at their own choice and own pace, using bilateral, regional, and/or multilateral avenues as appropriate."

Although the Conference received a big support for liberalization in grant of traffic rights, it conceded freedom to the States to liberalize grant of traffic rights at the pace and timing of their own choice. The primary reason for this outcome was that globally there is a substantial difference in the size of airlines, their financial position and their competitive strength. Accordingly, one common formula for all the States can not be the appropriate solution.

AIR SERVICES AGREEMENTS AND GENERAL AGREEMENT ON TRADE IN SERVICES (GATS)

The General Agreement on Trade in Services (GATS) provides a multilateral regulatory framework for the liberalization and expansion of trade in all service sectors under such trade principles as most-favoured nation and transparency. Currently, the GATS has an Annex on Air

Transport which covers three so-called soft rights, namely aircraft repair and maintenance, selling and marketing of air transport, and computer reservation system services. In 2000, the WTO-OMC took up its mandated review of the Air Transport Annex with a view to expanding its scope of coverage. Although the review was completed in October 2003, no consensus on expansion of the Annex could be reached with the result that the present Annex remains effective. The next review is scheduled towards the end of 2005. ICAO's approach, which has an important role in liberalizing international air transport regulatory system, is that future regulatory arrangements should be based on the general goal of gradual, progressive, orderly and safeguarded change towards market access.

Bilateral Agreements and Slot Allocation

The problem arising from capacity constraints at the airports and allocation of slots for landing rights is becoming serious at airports in some developed countries and even at some airports in developing countries. The shortage of slots is coming in the way of countries including India getting entitled additional slots from airports, such as at London-Heathrow airport, although landing rights have been obtained under the bilateral agreements. Globally, there are no set internationally accepted rules for allocation of slots at congested airports. The practices in this regard vary from grandfather rights to the sale and purchase of slots.

The International Conference on Air Transport in March 2003 discussed this issue and recommended that "in liberalizing market access, due consideration should be given to airport capacity constraints and long-run infrastructure needs. Problems involving air carriers which are unable to exercise their entitled traffic rights at a capacity constrained airport may, if necessary, be addressed in the context of discussions on the relevant air services agreements. In this regard, sympathetic consideration should be given to the request for preferential treatment from those States whose airports are not slot-constrained but whose air carriers are unsuccessful in obtaining slots at slot-constrained airports, consistent with relevant national legislation and international obligations". The Conference further observed that "any slot allocation system should be fair, non-discriminatory and transparent, and should take into account the interests of all stakeholders. It should also be globally compatible, aimed at maximizing effective use of airport capacity, simple, practicable and economically sustainable". It appears that the recommendations of the Conference are ambiguous and can be interpreted and twisted in many ways and do not provide any definite solution to the problem. However, fiscal measures have not been included in the recommendations.

MODULE V

AIRLINE MANAGEMENT IN INDIA

AIRCRAFT FINANCING AND LEASING IN INDIA

Introduction: The increasing popularity and possibility of leasing is dictated by the rapid growth of technical developments and the need for bigger and faster aircrafts. The airline companies had to face steeply rising costs and often could not afford to buy new aircrafts. At the same time these larger aircrafts contributed to temporary overcapacity, thereby reducing the profit of the airline companies. Thus one can say that privatization of aircrafts has led to the development of aircraft leasing and financing. An aircraft is an expensive commodity and aviation is a sector with great prospects so many private entities have started running airlines by acquiring aircrafts either through leasing or by getting it financed. As the aviation industry is growing by introduction of more and more airlines so is the business of leasing and financing of aircrafts. Therefore there arose an urgent need to regulate the aircraft leasing and financing industry. The article also briefly discusses the Cape Town convention and the Protocol which can be called the mother convention of aircraft leasing and financing.

AIRCRAFT LEASING IN INDIA

DGCA Provisions: By looking at the DGCA provisions relating to aircraft leasing a general idea can be obtained as to how aircrafts are leased in India.

Approval from the DGCA: This is a mandatory requirement to be fulfilled before leasing an aircraft in India . The lessor can be an Indian or a foreign operator. Where the Indian operator intends to take a foreign registered aircraft on lease, charter or any similar arrangement from a person holding Air Operator Certificate ("AOC") issued by another state, the following information has to be provided by the Indian operator to the DGCA at least forty-five (45) days prior to the proposed date of operation with the leased aircraft:-

a. name and address of the India operator and the lessor
b. aircraft details
c. AOC details along with operations specifications, if any, of the lessor
d. name and contact information of the State of Registry
e. a copy of the letter of intent
f. planned arrangements for operation and maintenance of aircraft during the lease period
g. proposed date of import into India.

In the event an Indian operator intends to borrow an aircraft on lease from an Indian operator (for domestic or international operations), the following information has to be provided to the DGCA at least forty-five (45) days prior to the proposed date of operation with the leased aircraft:-

a. Name and address of the operator from whom the aircraft is intended to be leased
b. AOC details along with operations specifications of the lessee and the lessor
c. Aircraft type, registration number and its main base
d. Maintenance agency with scope of approval
e. A copy of the draft lease agreement and maintenance agreement

f. Any amendment proposed to be made in the Operations Manual or other relevant documents
g. a document giving details of the respective responsibilities of compliance with regulatory requirements such as FDTL, arrangements for Flight Operations Quality Assurance, flight dispatch and responsibilities of the lessor and the lessee with regard to operation, maintenance and quality system of the aircraft.

Upon receipt of the above information, the DGCI finalizes the modalities for operation of the leased aircraft at a meeting with the Indian operator. Where the aircraft is taken on lease from a foreign operator, the representatives of the foreign operator and the regulatory authority are also allowed to participate in the meeting. The DGCA can conclude an agreement under Article 83*bis*with the State Registry and the State Operator for transfer of certain regulatory functions. It also has the discretion to impose conditions while granting permission to the Indian operator for operations with the leased aircraft.

Stamp Duty and the Lease Agreement: Pursuant to the DGCA permission, the Indian operator can conclude a formal lease agreement with the lessor. The agreement should include the conditions decided by the State of Registry and the State of Operator and the ones imposed by the DGCA. A copy of the lease agreement has to be, thereafter, filed with the DGCA at New Delhi (the DGCA usually asks for a notarized copy from the airlines). The copy of the lease agreement does not attract stamp duty in the State of Delhi but it is necessary to stamp the lease agreement in the relevant state, (the state in which the airline is incorporated or has its operational base), prior to filing with the DGCA. Stamping is necessary to ensure that the lease agreement is enforceable in a court of law. In India, the stamp duty rates vary from state to state.

TYPES OF LEASE AGREEMENT

Dry Lease: As far as Dry Leases are concerned following conditions have to be fulfilled: Registration of the Aircraft: Operation of foreign aircrafts on dry lease requires registration of aircraft in India. The leased aircraft ought to have a valid Certificate of Registration ("CoR") and Certificate of Airworthiness ("CoA") and must be entered in the operating permit of the operator. According to Civil Aviation Requirements ("CAR") regulations , registration of aircrafts can be done either in Category A or B. For leased aircrafts, the registration falls under Category A. The registration of the aircraft is valid as long as the lease is in force and the aircraft is maintained and operated in accordance with

a. the DGCA regulations
b. the terms and conditions specified in the operator's permit and
c. the operator's maintenance control and operations manuals.

The operator can apply to DGCA for extension of validity of the CoR.

Airworthiness of the aircraft: Once the aircraft is registered, the owner or his authorized representative has to apply to DGCA in a prescribed form together with the requisite fees prescribed in rule 62 of Aircraft Rules 1937 for obtaining CoA. An application for issue of

Aircraft Noise Certificate is also to be made along with the CoA application. CoA is valid for a period of twelve (12) months. In case of imported aircraft, the validity begins from the date of issue of Export Certificate of Airworthiness and is restricted to the validity specified in the Standard Certificate of Airworthiness issued by the country of export.

Some other conditions to be satisfied for dry lease of an aircraft are as follows:

The Indian aircraft operator:

- is responsible for airworthiness and control of the aircraft;
- has to provide complete aircraft maintenance program to the Regional Airworthiness office for approval including the issue of flight release, maintenance policy, storage lives of components;
- has to train its engineers and flight crew to the satisfaction of DGCA and obtain necessary approvals before maintenance or operation of the aircraft commences;
- should establish his own ancillary shops for investigation of failed components, repair and overhaul of the retables installed on the aircraft or collaborate with other operators;
- should have an operations manual for the type of leased aircraft, which should be updated regularly. All the flight crew should be made thoroughly familiar with the contents of the manual before they start flying the aircraft type;
- should comply with all the safety regulations and fit the requisite instruments and equipment's in the leased aircraft in accordance with the DGCA regulations;
- importing aircraft on lease has to ensure that all the Airworthiness Directives, modifications and inspections declared mandatory by DGCA are complied with even if their compliance is not mandatory in the country from where the aircraft is imported.

Wet Lease: Pre-conditions for a Wet lease are as follows:

Operation of foreign aircraft leased by Indian operators is normally permitted on dry lease basis. Import of aircraft for domestic air transport operations on wet lease basis is not permitted except in emergency situations and in the following circumstances such as

- the existing aircraft of an operator is grounded for maintenance/inspection checks or due to any other unforeseen reasons. (In such cases, wet leasing is permitted only for the duration of grounding of aircraft); OR
- the existing aircraft is involved in some accident/incident or due to expiry of existing lease and delay in finalization of new lease agreement, there is a reduction in capacity of the operator; OR for revival of sick operators who should have an agreement with the lessor initially for wet lease for a period not exceeding six (6) months and, thereafter, automatic conversion to dry lease for the remaining period of lease; OR
- short term induction of capacity required to meet emergency situation such as natural calamity, industrial unrest or any other similar situation.

Other important provisions pertaining to operation of aircrafts on wet lease are:-

The State of Registry has to confirm that their legislation enables them to divest themselves of the functions and duties which are the object of the transfer agreement, agree for surveillance of aircraft operations and maintenance by DGCA, and furnish a letter from the concerned regulatory authority to this effect

There should be a well defined agreement between the lessee and lessor stipulating that the Indian operator and DGCA will have the authority to exercise airworthiness and operational control on the wet lease aircraft operations

a) the lessee and the lessor must hold a valid and current operating permit or AOC for the type of operations
b) the aircraft should not be older than fifteen (15) years since manufacture
c) the aircraft should be free from any accident; in case of one, details thereof should be furnished to the DGCA
d) the flight crew and the maintenance personnel have to comply with the Indian
e) operator's and the DGCA's instructions and maintain the aircraft in accordance with the latter's regulations
f) the foreign crew and maintenance engineers can be deployed only after they are cleared by the security agencies and on issue of validation/approval by DGCA
g) the aircraft has to be endorsed on the permit and Operations Specifications of the operator.

Mandatory Provisions for Both wet and Dry Lease:

For leased aircraft operations in India, the aircraft should have been type-certificated by Federal Aviation Administration of USA or Joint Airworthiness Authority of Europe or Civil Aviation Authority of UK or any other authority acceptable to DGCA. It is the operator's responsibility to confirm that the lease agreement does not contain any provision which will be binding the DGCA. The lessor, on his part, has to give an undertaking in the lease agreement that he will comply with all the applicable CAR rules. The DGCA can withdraw permission for operation of a particular aircraft in India under lease agreement if during service it is found that safety of the aircraft operations is in doubt or CAR requirements or any other safety rules have not being complied with.

Issues and concerns relating to aircraft leasing in India:Despite the rapid growth of the Indian aviation market in recent years, the Indian legal, tax and regulatory environment continues to represent a challenge for lessors and financiers of aircraft – both at state and national level. A variety of issues will present themselves to any non-Indian lessor or financier of an aircraft to an Indian operator. These issues will arise in the context of:

- the leasing of the aircraft
- the making of lease and guarantee payments
- the security package and are often magnified by the lack of clear authority and precedent in India. A "typical" range of considerations for any inward lessor or financier is likely to include:

- the fact that a withholding tax exemption must be obtained from the Indian Ministry of Finance in relation to lease rental payments
- the fact that exchange control approval from the Reserve Bank of India will be required in relation to certain lease / lease-related and guarantee payments
- the fact that Indian statutory law does not make provision for mortgages over aircraft
- the fact that traditionally written assignments of insurances are likely to attract significant stamp duty costs
- the likelihood that Indian stamp duty will apply in relation to a variety of the transaction documents. The amount of stamp duty will vary from state to state and can be charged on copy documents that are brought into certain states

Conclusion: There is a dire in need for India to develop its aircraft leasing and financing industry as by 2020 it is estimated that India's aviation sector could absorb up to $120 billion of investment. India has become the ninth largest aviation market in the world within few years time. Analysts also predicted that domestic traffic could reach 160-180 million and international traffic in excess of 50 million. This means that more and more aircrafts would be required by airline operators which can be afforded only through leasing and financing. For this the process of leasing should be made less complicated. Implementing the Cape Town Convention and the Aircraft Protocol ratified by India can ensure security to both the lessor and lessee through its provisions as well as the Registry set up under the Convention. Also the laws and policies which govern the aircraft leasing that are applicable in India should be made less complicated so as to ensure that the foreign investors are not prevented from leasing aircrafts to Indian operators and visa versa. The implementation of the Cape Town Convention ensures that the international as well as domestic interest of the parties is protected by means of the International Registration System. The system protects the interest by applying the basic priority rule through which right of the first or prior lessor or lessee is protected. However the Convention to some extend has left certain matters to the Contracting Parties such as the Courts that would decide matters in case any default is committed by either party. So India has to ensure that all the issues that have been addressed in this paper are taken care of or resolved as India being an upcoming economy it would be needing more and more leasing and financing companies to enter the aviation sector which can cater to the needs of our aviation sector.

LIBERALIZATION IN INDIA

Concept of landing rights

Landing right in the context of air transport services means right of an airline to land its aircraft at an airport. The subject of landing right is quite complex and involves several issues, such as, who grants the right, right for what purposes, choice of airports and slots, rights for domestic operations and international operations, sale of such rights, conditions for the use of rights, including payment of landing charges, etc.

Landing rights for domestic operations

Grant of landing rights for domestic operations is relatively simple. Once an airline is registered it should normally be able to operate on any route and land at any airport within the country. However, the licensing authority can impose certain conditions on the operators. For example, in India, under the Flight Dispersal Plan, certain obligations have been placed on airlines operating routes connecting metropolitan cities. For this purpose the routes have been divided into three categories. Category –1 includes routes connecting (1) Mumbai with Delhi, Kolkata, Chennai, Bangalore, Hyderabad and Trivandrum, (2) Delhi with Kolkata, Chennai, Bangalore and Hyderabad and (c) Kolkata with Bangalore and Chennai. Category II includes routes connecting stations in North-Eastern region, Jammu & Kashmir, Andaman &Nicobar and Lakshadweep. Category III includes all other routes.

Under the Flight Dispersal Plan any one who operates scheduled air transport services on one or more of the routes in Category I shall be required to provide at least 10% of the capacity he deploys on routes in Category I for routes in Category II. Furthermore of the capacity thus required to be deployed on routes in Category II, at least 10% would be deployed on services or segments thereof operated exclusively within the North-Eastern region, Jammu & Kashmir, Andaman & Nicobar and Lakshadweep. Moreover, the operator will deploy on routes in Category-III, at least 50 percent of the capacity he deploys in Category-1 routes. The definitions and the details of the Flight Dispersal Plan are provided in Annexure 1.

Restrictions on landing rights can also be imposed by the authority managing the airport after taking into account the capacity at an airport and also facilities and services available. In India, Mumbai and Delhi airports have capacity problems in early morning hours and also in the evening as most of the airlines wish to leave for destinations early in the morning or in the evening. Presently, such capacity problems are sorted out by a scheduling committee set by the government by dispersing the flights after discussion with airlines. Further, depending upon the length, width and strength of runway maximum load restrictions can be placed on certain types of aircraft. Restrictions can also be placed on night landings at airports with no lighting facilities.

Landing rights for international operations - ICAO's role

Landing rights for international airlines pose additional problems, which are rather complex. Such problems emanate from the basic nature of every international flight, which involves an agreement between at least two sovereign States. ICAO's has been playing a very important role in developing international air traffic and grant of landing rights for international air transport. It is to be noted that the Chicago Convention is the most important international convention on civil aviation to which presently 188 States, including India, are signatories. The provisions of the Convention are binding on all the Contracting States and no State can exempt itself from any of the provisions.

Article 1 of the Chicago Convention recognizes exclusive sovereignty of the State above its territory. This provision thus debars an airline belonging to one State from landing in the territory of another State without specific agreement of the latter. This has given rise to regulation of landing rights through a number of bilateral and few multilateral agreements.

Nevertheless, the Convention provides safeguards against possible arbitrary action by States, which may not be in the best interest of international civil aviation. For example, Article 15 of the Convention regulates the use of the facilities and services at an international airport open to public use. This article sets out three basic economic principles relating to the use of airports and air navigation facilities and services at international airports and the charges for their use. These principles are: (a) application of uniform conditions for all the airline operators in the usage of facilities and services; (b) non-discrimination in charging aircraft operators for the facilities and services at airports and for air navigation services; and (c) no charges to be levied solely for the right of aircraft transit over, entry into or exit from the territory of a Contracting State. These principles reflect the concern of the Contracting States to avoid the possible abuse of monopoly power by the providers of airports and air navigation services.

The Convention includes several other articles having a bearing on regulation of air transport. These are: Article 5 on non-scheduled flights; Article 6 on scheduled services; Article 7 on cabotage (the privilege of a State to operate domestic air services in another State); Articles 17 to 21 on nationality of aircraft; Article 22 on facilitation; Articles 23 and 24 on customs and immigration; and Articles 37 and 38 covering standards and recommended practices regarding facilitation, etc.

The second major international agreement of considerable importance after the Chicago Convention affecting international air transport is the International Air Services Transit Agreement signed at the time of the adoption of the Chicago Convention. This Agreement provided for the multilateral exchange of rights of overflight (the privilege to fly across the territory of other contracting states without landing, generally known as the "first freedom of air") and non-traffic stop for scheduled air services among its Contracting States (the privilege to land for non-traffic purposes, is generally known as the "second freedom of the air"). (The various internationally known "freedoms of the air" are described in Appendix 4.) As many as 115 States, including India, have ratified this agreement. The worldwide Air Transport Conference organised by ICAO in 1993 recommended that States pursue and ICAO promote, universal adherence to and implementation of the International Air Services Transit Agreement.

The third major agreement was International Air Transport Agreement which was of far reaching consequence in liberalising international air transport operation and granting Contracting States the right to "five freedoms of the air", namely, (1) the privilege to fly across its territory without landing; (2) the privilege to land for non-traffic purposes; (3) the privilege to put down traffic coming from home State of the carrier in to the territory of other Contracting State; (4) the privilege to take on traffic destined for the territory of the State of the carrier; and (5) the privilege to take on passengers, mail and cargo destined for the territory of any other Contracting State and the privilege to put down passengers, mail and cargo coming from any such territory. However, only 19 States out of which eight States, including the United States, later withdrew could ratify this agreement. Thus, this agreement is of limited international value. India is not a signatory to this agreement. If this agreement had been ratified by all the States, the shape of international air transport would have been completely different from that it is today and there would have been no place for bilateral or regional agreements.

Landing rights for international operations-bilateral agreements

The lack of success of efforts by the international aviation community to establish a multilateral regulatory regime for the commercial aspects of international air transport led to the community falling back on bilateral air services agreements. Bilateral agreements are undertaken jointly by two parties, most typically by two States, although one or both parties might also be a group of States, a supra State (i.e. a community or other union of States acting as a single body under authority granted to it by its member States), a regional government body or even two airlines. The goal of bilateral regulation in the international air transport field is typically the conclusion, implementation or continuance of some kind of inter-governmental agreement or understanding concerning air services between the territories of the two parties.

The bilateral regulation of international air services has evolved over a period of many decades. Such agreements constitute the largest volume of international air transport regulatory documents, which date from the Chicago Convention signed in 1944. The extensive use of bilateral agreements to regulate international air transport is a consequence of the provision in the Chicago Convention regarding the principle of national sovereignty over territorial airspace.

Although each bilateral air services agreement is unique in nature; these agreements typically have in common numerous essential provisions most of which, while not identical, have a similar thrust. Such commonly found substantive provisions include: grant of traffic rights, a fair and equal opportunity, airline ownership, designation of air carrier and authorization, principles for regulation of capacity, fixation of tariffs, exchange of traffic statistics, right to carry out commercial activities in the territory of the other party, mutual recognition by the parties of each other's certificate of airworthiness, competency and licences, procedure for cooperation regarding security, use of computer reservation system, provisions regarding exemption from payment of customs duty and taxation of earnings of the air carrier, user charges, and application of national laws, etc.

We are seeing governments progressively liberalise bilateral agreements. Over the last year, we have seen significant increases in capacity granted by China to Australia, Singapore and Malaysia. Hong Kong is expected to be added to the list. It would appear for all intents and purposes that Hong Kong has abandoned its 'one route one airline policy'. As well, the Australian and Singapore Governments have signaled their intent to sign an open-air-skies agreement. At present, the US remains a serious stumbling block to industry deregulation. Realistically, we cannot expect to see much quick progress – certainly not until all their carriers have checked out of bankruptcy and recovered their financial health. Other important markets, like Japan, remain heavily restricted, although we would expect them to adopt deregulation when the US does.

China is also liberalizing grant of landing rights to foreign airlines. It has long maintained restrictive air services policies to protect its state-owned airlines, but that is changing. CAAC, which negotiates bilateral air services agreements for the government, has been giving foreign carriers progressively more rights to operate to the country's gateway airports at Beijing, Guangzhou and Shanghai. Additionally, China has been signalling its willingness to open up further and allow more competition between foreign airlines and the country's major carriers.

Earlier this year, Singapore Airlines became the first carrier to win rights to operate services beyond China to a third country.

India has not remained insulated from the global trends. The liberalization process in domestic air services commenced in the year 1986 but in international scheduled services it commenced only recently. The liberalization process can be considered evolutionary rather than well thought out and planned. The government has been periodically reacting to the field situation in the country, international developments and pressures from the aviation industry, especially the private operators. Nevertheless, several far-reaching changes have been brought about in the structure of the aviation industry in the past few years. The most important development has been unshackling of the airline industry from the monopoly of the State. State-managed airlines have been thrown open to competitive impulses of the private airlines. Within the ambit of bilateral agreements, India is liberalizing grant of traffic rights to foreign airlines, including fifth freedom rights. Also, Air India permits foreign carriers to use its right to operate certain services subject to commercial arrangement. Moreover, additional frequencies are permitted to the foreign airlines during peak season. In this process Air India collects commercial rents or fees from those airlines using its traffic rights or operating extra flights. Capacity limitations on international routes have been considerably relaxed. Domestic private carriers are operating on some international routes. Control on fares and freight rates have been abolished.

International scheduled passenger services from and to India are essentially governed by the provisions of bilateral agreements between India and the concerned foreign countries. From the operational angle, these bilateral agreements can be placed in four categories, namely, (i) agreements where Indian and foreign operators are fully utilizing their traffic rights, (ii) agreements where Indian operators are utilizing only a part of their traffic rights, (iii) agreements where Indian operators are not at all utilizing their traffic rights and (iv) agreements where none of the parties are presently operating any services. It has to be noted that bilateral agreements contain enabling provisions and are not mandatory in the sense that agreed services must be operated. Actual operation of services by any airline having traffic rights depends upon a number of factors, including commercial viability of the service, availability of capacity and availability of suitable aircraft with the airline, availability of suitable slots, etc. Thus, it is not necessary that each and every traffic right must be utilized. In an ideal situation, airlines of every country can expect to share 50 percent of the total traffic between two countries. If it is achieved in actual practice, it can be generally concluded that the country is almost fully utilizing its traffic rights. Presently, Indian carriers' overall share in international passenger traffic is about 30 percent.

Major challenges faced by civil aviation in India

Despite significant positive developments, presently civil aviation in India is facing a number of challenges. In the case of airlines, the major challenge is utilization of international traffic rights under the bilateral agreements with a view to fully meeting the demand for air travel. Other challenges in the case of airlines include enhancing the capacity of Air India and Indian Airlines to meet the demands placed on them and developing a level playing field for them vis-à-vis private domestic airlines thereby enabling them to offer effective competition. Privatization of Air India and Indian Airlines, higher fuel prices and taxes, operation on uneconomic routes, making air transport affordable by common man, etc. are other challenges.

The airports in the country are not suitably developed and the standard of service provided by them is generally poor. Presently, there are 12 designated international airports in the country including Srinagar airport which was declared as international airport recently but all of them lack world class facilities. The two major airports at Delhi and Mumbai are in urgent need for expansion of capacity, apart from major improvements for providing quality services. There is growing concerns regarding safety and security. Increasing noise levels and other environmental impacts and their associated costs are other areas of concern. Mumbai and Delhi airports are still to be developed as major hubs. A new international airport at Mumbai under consideration for over 30 years is still not in sight. Cargo facilities are inadequate. Privatization of airports at Mumbai and Delhi is still in the pipeline and posing several issues. Other airports also need expansion and considerable improvement. On the other hand, several airports have unutilized capacities and if managed properly can relieve congestion at some other airports. Presently, only ten out of 125 airports are financially viable and others are cross-subsidized by these airports. The challenge before the Government and the Airports Authority is how to minimize the losses incurred by 92 percent of the existing airports.

In the case of air navigation services, the challenge is how to increase capacity and enhance safety on routes by installing modern equipment, finding solution to the problem created by the reservation of a large segment of air space for Defence and challenges from some neighbouring countries in developing alternate air routes bypassing India. As regards regulation, there is no independent regulatory authority for civil aviation, especially for economic issues. Moreover, there is no well defined civil aviation policy which should preferably be a part of integrated transport policy.

Liberalization in Bilateral Agreements

The current spate of liberalization permitting foreign airlines serving Indian airports to provide additional capacity to meet the demands during peak winter months has worked well. Moreover, this arrangement has provided considerable respite to the tourists and other travellers to and from India. As a short-term policy, this approach can be considered satisfactory. But from a long-term point of view such a policy may not be considered appropriate as it adversely affects the role of Indian carriers.

It is to be noted that while the Government has been becoming liberal in permitting foreign airlines to operate additional services subject to commercial agreement with Air India, for a long time no such permission had been given to private Indian operators to provide services on international routes. In the past Government policies have been obsessed with protecting the interest of Air India and Indian Airlines. While domestic operations were thrown open to private sector in 1986, the international operations remained entirely in the domain of Air India and Indian Airlines with some relaxation only last year when Jet Airways and Air Sahara were allowed to operate regular air services to and from India to countries other than Gulf countries.

Recently, Government has entered into an open skies agreement with USA. Under this agreement both countries will be free to select routes and destinations based on consumer demand without any restrictions on capacity, frequencies and designations of airlines and

pricing. Other bilateral agreements are being revised to increase capacity on a number of routes. It may also be noted that the Government has been liberalizing international air transport services in bits and pieces. Time has come when the Government has to formulate a clear long term policy for civil aviation. In fact, it will be more appropriate to formulate a long term integrated transport policy covering all modes of transport, including civil aviation.

Open skies

As a part of the ongoing move towards liberalization of air transport services, the Government has adopted open skies policy in regard to tourist charters and cargo traffic. The liberalization relating to international tourist charters is unilateral and not part of any bilateral or multilateral agreement. The liberalization is primarily to encourage tourism. It covers both inbound and outbound traffic. Inbound charters are permitted to all airports in India. Customs and immigration facilities with short notice are to be provided at airports. A tourist charter flight can transport the tourists on domestic sectors also within India. There are no restrictions with respect to size of aircraft, frequency, and total number of charters, tariffs and marketing. Indian passport holders are allowed to travel on such charters. Carriage of cargo is permitted on charter flights. The operators can operate charter flights on a regular basis like scheduled flights. An operator organizing outbound charters needs to organize inbound charters, maintaining a ratio of 1:2 in the number of inbound and outbound charters. The obligation of 1:2 is not required in case of outbound charters with aircraft size of nine or less passengers and also in case of religious pilgrimage like Haj.

The policy of the Government in regard to international tourist charters is quite liberal except perhaps in the matter of maintaining the ratio between outbound and inbound charters. The present liberal policy is yielding results and is helping in the promotion of international tourism to India. This policy is particularly important because of the general shortage of capacity with the international airlines operating from and to India during peak seasons. The present policy needs to be continued.

As regards cargo, during the 1980's, India faced a chronic shortage of capacity for the carriage of international cargo meant for exports. This was essentially due to serious imbalance between the demands for capacity for exports and imports by air and inadequate supply of capacity with the national carriers. The volume of exports had been almost double of imports. The airlines were reluctant to do empty haulage with controls on freight rates. As the export industry demanded on-time delivery of raw material and manufactured goods, and as the time sensitive materials were to be delivered more frequently by air, capacity constraint was regarded as the key obstacle that hindered the industries from enhancing exports and earning foreign exchange.

In this environment, in 1990, the Government adopted a bold policy of "open skies" for international air cargo. As per this policy any airline, both Indian and foreign, which meets specified operational and safety requirements, is allowed to freely operate scheduled and non-scheduled cargo services to/from any airport in India where custom/immigration facilities are available. Regulatory control over cargo rates is abolished and thus the carriers are free to set their own rates. The "open skies" policy for international cargo services is unilateral without comparable rights for Indian carriers from bilateral partners in return. Initially, the policy was for a period of three years but now it is without any time limit. The "open skies" policy for cargo led

to an immediate strong growth in international cargo traffic and removed the shortage of capacity for exports. The imbalance in the volume of exports and imports still continues to remain in the ratio of about 2:1 as in the past. The present policy needs to be continued.

Further Liberalization: From the detailed expose in the preceding sections, certain conclusions are obvious. Globally, the civil aviation industry is being progressively liberalized in all respects including bilateral agreements and open skies. Such liberalization is taking place in all parts of the world but the extent and timing of liberalization are different. Whether and when it will lead to complete open skies policies and a multilateral agreement among almost all nations of the world is difficult to predict. This can be considered as a possibility in distant future. ICAO and GATS are already working in this direction.

Along with the rest of the world India has moved forward in liberalizing its civil aviation sector but only gradually in an evolutionary manner. Keeping in view the global speed of liberalization, India has moved more than halfway and is much ahead of many countries in the world in many respects. Further liberalization efforts are in the pipeline. Certainly more needs to be done as capacity constraints are hindering the growth of air traffic and tourism and also India's share in international passenger transport from and to the country is only 30 percent as against the ideal norm of 50 percent. There is an urgent need for a clear enunciation of a long term civil aviation policy, preferably as a part of integrated transport policy including all modes of transport. This is essential as with the emergence of no frill low fare airlines, the competition between upper class rail travel and air transport may increase significantly in future.

Impact of Liberalization: Liberalization in civil aviation has largely benefited all the stockholders. The tourist traffic is the main beneficiary of liberalization in grant of traffic rights as it is leading to increased frequency of airline operations, multiple options and improved service at a cheaper price. Introduction of no-frill low fare airlines will give further boost to tourist traffic. The tourist traffic accordingly can be expected to grow faster in future. Other users of air transport, both passengers and shippers should be more than happy with liberalization as services improve; options increase and fares and freight rates decrease in real terms. These will result in increase in demand for air services. The concessionaires at the airport will also benefit from higher sales and increased business income.

With rapid growth in air traffic including tourist traffic the foreign exchange earnings from tourism will grow faster and also the employment. The increase in business traffic will help in the growth of foreign trade, especially exports with consequent benefits to the economy. An important impact of liberalization will be significant growth in traffic at the airports. So far as an airport has additional capacity any increase in traffic will lead to better utilization of facilities resulting into higher revenues and improved financial viability. However, major international airports in India have no spare capacity, especially during peak periods and hence they will become more congested and the quality of service may deteriorate in the short-term. In the long-term the capacity and quality of services can be expected to improve.

Conclusion: Liberalization in civil aviation is an ongoing process. Future will witness greater liberalization in bilateral agreements and larger number of open skies agreements. There may be

increase in regional agreements. The ultimate end of liberalization is multilateral air agreements and abolition of bilateral agreements.

AIRLINE MERGERS AND ACQUISITIONS IN INDIA

In the present era of liberalization and globalization, questions relating to the impact of mergers and takeovers on the economy of a country, warrant our immediate attention. During the past few years, India has followed the worldwide trends in consolidation amongst companies through mergers and acquisitions. Mergers and industrial restructuring have raised important issues both for business decisions and for public policy information. The daily newspapers are filled with case studies of mergers and acquisitions, tender offers (both friendly and hostile), spin-offs and corporate restructuring, changes in ownership structures, units being hived off and struggles for corporate control.

Mergers are like a marriage in the romantic jargon. Usually there is a period of courtship leading to the joining of two or more separate entities into one, after which the parties hope to live happily ever after, i.e., to say a Merger is said to occur when two or more companies combine to form a new company. Mergers in aviation industry are also very relevant to the present economy because it affects directly the life of large number of people who frequently use airway for commuting from once place to the other place. The direct affect involves the frequency of the number of flights being operated by different airlines in a specific route and the cost that has to be paid by the customer to avail such facility. Mergers in aviation industry would definitely affect both these concerns of the prospective or frequent customer.

Airline mergers and alliances can allow airlines to lower cost and enhance demand by rationalizing the combined networks, and expanding the scope of seamless service. On the other hand, airline mergers and alliances can reduce competition and enhance market power, especially on non-stop routes to and from hub airports. The relative balance of the efficiency benefits and the competition effects depends on a number of factors, including the degree of overlap in the airlines' networks prior to the merger.

The promotion and protection of competition in the airline industry requires attention to both competition and regulatory issues. In particular, competition in the airline industry could be preserved and enhanced through:

Further liberalization of regulatory constraints on competition, especially at the international level, including for example, the application of international trade principles of transparency and non-discrimination within multilateral context;

- Attention to the mechanisms for investment in and allocation of scarce airport capacity including investment in new airports, expansion of existing airports and mechanisms for ensuring that facilities are available to entrants at key times;

- Careful review of proposals for mergers and alliances, careful use of remedies to offset anticompetitive effects and consideration of divestiture or separation in cases of dominance;
- Close review to frequent- flyer programs and other loyalty schemes;
- Careful control over predatory behavior and other anti-competitive practices.

Jet-Sahara Merger: Heralding The Consolidation In Civil Aviation Industry:

It seek to examine the significance of Jet–Sahara merger against the backdrop of liberalization and privatization of civil aviation sector. Having witnessed a tumultuous journey interspersed with legal hurdles owing to which it was held in abeyance, the resurrected merger has triggered the market driven consolidation of aviation industry. Secondly, it uncover the ramifications of this merger on the health of low cost carrier in the proposed paper. The Jet–Sahara combine will re-assert the leading private airline's supremacy in the Indian skies and empower it to fight the low fares offered by low cost carriers. This deal has erected a conspicuous entry barrier as evidenced by the changing dynamics of low cost carriers with Jet acquiring dominant market share and enhanced airport infrastructure.

Thirdly, it made an attempt to explore the legal underpinnings of this deal to understand the role of mergers and acquisitions in the aviation sector. This deal is saddled with monopolistic traces making Jet the largest player in Indian airspace and the sole private airline to possess international flying rights. (In the current scenario, Kingfisher has attained clearance from the civil aviation ministry to operate international flights courtesy the Kingfisher-Deccan deal). The MRTP Commission gave the green signal to deal silencing all analysts claiming abuse of dominance. The probe was in a way restricted as clauses relating to monopoly, mergers and acquisitions in the MRTP act had been deleted in 1991. With establishment of the new competition regime addressing legal concerns exhaustively, the aviation industry can expect stricter vigilance in future consolidation advances.

Fourthly, it undertake an analysis of regulatory obstacles that have been exposed through this deal. The transfer of assets such as parking and landing slots were being governed by land lease agreements and couldn't change hands through merger. The civil aviation ministry settled the dust by charting guidelines regulating transfer of airport infrastructure in all merger schemes.

CONSOLIDATION IN AVIATION INDUSTRY

Recently, we witnessed 1st wave of consolidation in aviation industry, it is nothing but an offshoot of liberalization (deregulation). Airlines are the worst performing of any of the individual sectors in the air transport chain and one standard response to poor financial performance is Consolidation. The industry presents a paradox in spite of having robust earning and excess cash, it suffers from syndrome cycle which has made it marginally profitable in spite of rise in traffic in past fifty year.

Looking at the US airlines and European Carriers we can analyze that the consolidation strategy in airlines is done in three main steps: (1) carriers starts with domination of their own home

markets through acquisitions; (2) Secondly, they attempted to establish a foothold in the larger foreign markets outside their own, by merger and taking over of foreign airlines.(3) Lastly the airlines focuses on development of global marketing spread through one or more alliances. A similar kind of module is being seen in Indian scenario were Indian carriers have been merging with other domestic airlines, it can be said that we are on the first step of consolidation strategy.

By analyzing the industry we can state that the main factor which ushers for consolidation are: (i) Marketing benefits; (ii) Cost synergies and reductions; (iii) Reducing competition, which an airline will get after merging. Factors can also be country specific like in Indian scenario these are, (i) High Fuel cost leading to high cost of operation; (ii) Absorption of losses in case of merger under section 72(A) of Income Tax 1961 Act;(iii) High Congestion on airport and lack of slots; (iv) Governmental policy [Like to Fly foreign skies an airline need to have 5year and fleet size of twenty, hence by merger kingfisher now can assess foreign skies]. Further the oligopolstic nature of aircraft manufacturer has also fueled the M&A by cutthroat competition in pricing. Initially this low pricing led too rise of new carriers but only few survived, and rest were forced to file for bankruptcy or they merged with the incumbent players of this field.

The procedure for merger in the Indian scenario is governed by Companies Act 1956. At the outset it require worth mention that such procedure is very cumbersome and there is need for more efficient merger mechanics. Further the approved airline merger under the auspices of tribunal requires a clearance by Home Ministry and Civil Aviation Ministry. In future takeover whether friendly or hostile will be prevalent in airline industry and they will also be required to have above clearances. Lastly once the competition commission of India will start working there will be one more addition to the above stated list.

COMPETITION LAW ISSUES IN AIRLINE MANAGEMENT

The liberalization of the airline industry in the 1990s lead to a notable increase in the role of the private sector. No longer were the Indian skies dominated by the state run carrier, but the exclusive monopoly of the state carrier came crashing down.

If there was hope that this would herald a scope for competition in the airline industry with airline companies jostling with each other to provide more attractive fair or services, the hope was short lived. The airlines which had generated not just money but unbridled enthusiasm with their promise to fly high came crashing down. Many reasons have been attributed to such crash, which include unplanned expansion as well as interference of government in key policies despite deregulation and ironically deregulation itself has been blamed as a cause. After a long pause, however, it had been the turn of new private carriers to enter the fray. With the emergence of low cost carriers on one hand and connoisseurs of good times on the other the Indian passenger was pampered with more choice in economy and luxury than ever before. The airlines were however to enter the second phase of market challenge soon.

It is important in the context of a developing country like India to keep two posits in mind. The first, no air passenger wishes to return to the days of state dominated control in the aviation airline sector. Second, anti competition behavior on the part of the private players is going to defeat the purpose of deregulation. These two posits are often at conflict with each other. While a remedy against anti competitive behavior is necessary it must be balanced with the concern to keep the private sector alive and thriving. With this objective in mind, we may address the anti competitive behavior in the airline sector in India and simultaneously learn lessons from international experience.

Aviation is an important and significant sector contributing to our economy. It has witnessed tremendous growth in recent past with the coming of low cost carriers and increasing competition. The major players in the air industry include Indian Airlines, Air India, Jet Airways, Air Sahara, Kingfisher, Air Deccan, Paramount, Go Air, Spice Jet and Indigo while Kingfisher , Air Deccan and Air India, Indian Airlines and Jet , Air Sahara have respectively merged into single entities in the year 2007.

In the event of these three mega mergers of airlines, which now post-merger account for 80 % market of aviation industry, there has been lot of discussion on competition related issues involved to them. Not only this, there are many other competition issues pertaining to Air sector. Before identifying the same, it will be relevant to give brief insight to our present competition policy and law in India. Competition Act, 2002 which replaced the MRTP Act, 1969 came into being in the pursuit of globalization of Indian economy and liberalization and removing of controls. Its main objectives include- preventing practices having adverse effect on competition, to sustain competition, ensure freedom of trade in Indian markets and to protect interest of consumers. The core of law relating to competition basically provides for -1. Prohibition of entering into anti-competitive agreements, 2.Abuse of dominant position by an enterprise, 3. Regulation of combination of persons and enterprises (which includes mergers and acquisitions).The objective of the forthcoming paper is to examine the anti competitive practices in aviation sector in the light of above issues.

To begin with, the loyalty programs of the various airlines such as frequent flyer programs, travel agent incentive plans etc constitute anti-competitive practices. Frequent flyer programs basically rewards customers with free travel on the basis of build of miles or points they have gained on each travel by that specific airline .Similarly, in travel agent incentive plans, the travel agent earns more commission and rewards for directing travels of customers towards that specific airline. Such rewards are objected to increase bookings on that particular airline. Likewise, in the corporate arrangement plans, negotiations are done with corporate houses to take most of their travels with that specific airline by giving special incentives to them. Such practices tend to restrain competition in the market and demands of review for purposes of anti competitive issues.

Further, in aviation sector, there are several agencies that host airport services such as catering services, maintenance and refueling services, take off and landing slots, baggage and passenger facilities etc. Merger between the two firms which collectively have dominant position and

monopoly in the market in these services shall have significant impact on competition in air services. The merged entity shall have extensive network and high frequency of flights pending in respect to these services. In such event, infrastructural limited capacity and scarcity acts as barrier for new entry and strengthens merging or incumbent position.

Commonly, it has been the practice of two airlines to enter into alliances or cooperative agreements to share frequent flyer programs, code sharing etc. This is another instance of abuse of dominant position which airlines enter into to strengthen their market presence. For example code sharing which means arrangement wherein airlines sell seats under its own name on another airline's flight like for the purposes of complementary routes. Such alliances reduce competition on overlapping routes where allied airlines were formerly the main competitors. This has serious anti-competitive effects and leads to monopolistic behavior in the competitive environment.

The mergers and acquisitions in industry can also lead to anti-competitive impacts by way of price increase and collusion and restraint of new entry. Competition concerns needs to be addressed in relation to the same so as to prevent merged entity for from attaining dominant position in market to restrain competition. For example, with merger of two main competitor airlines which had peak take off and landing slots on all main airports shall lead to restraint in competition.

Further another important issue which needs attention is entry of new competitor in industry in the light of our domestic air travel policy. There are several issues such as minimum fleet size, minimum equity capital requirements, and route dispersal guidelines for new entrants which need reconsideration. Further limited fixed capacity of airports, acute shortage of landing and takeoff slots may act as barrier to for new entrants while the merged entity continues to hold dominant control over peak timed slots and strengthens incumbent position and their profitability. Fair allocation of slots instead of first cum first rights is necessary in interests of fair competition. Therefore, the need of hour is that consolidation in aviation industry which restrains fair competition should not be done at the detriment of consumers in any manner whatsoever or which has adverse effects on freedom of trade for enterprise.

Competition in Slot Allocation

Civil Aviation plays an integral role in development of an economy. It helps in realizing the socio-economic objective of providing connectivity to foster travel & trade. As per International Civil Aviation Organizations' estimates, every 100 $ spent on air travel produces benefits worth 325 $ to the Economy. The Indian Aviation Sector has witnessed tremendous growth in the recent past which is driven by sound demographic, macroeconomic, government aided reforms & market dynamics. The three fold increase in consumerism, rising disposable income; booming aviation sector; burgeoning middle class; increasing business travel; government reforms; entry of low cost carriers; increasing competition etc. have positioned the Indian Aviation

Sector in a high growth trajectory:

In order to maintain this high growth trajectory, it is very important that competitive forces must continue to operate with in this sector. In this report my focus shall be on the competition related issues surrounding Airlines with special emphasis on M&A in light of Competition Act, 2002. In common parlance competition in the market means sellers striving independently for buyer's patronage to maximize profit or other business objectives. A buyer prefers to buy a product at a price that maximizes his benefits whereas seller prefers to sell the product at a price that maximizes his profit. Competition makes an enterprise more efficient and offers wider choice to consumers at lower price. Fair competition is beneficial for the Consumers, Producers / Sellers and finally for the whole society since it induces economic growth. In order to realize this objective to competition in the economy, the Competition Act, 2002 was passed which replaced MRTP Act, 1969.The objective of Competition Act is to prevent anti-competitive practices, promote and sustain competition, protect the interest of the consumers and ensure freedom of trade. The objectives of this Act are to be achieved through the instrumentality of the Competition Commission of India (CCI) which has been established by the Central Govt. w.e.f 14th October, 2003.

Areas focused under the MRTP Act, 1969:

- Prohibition of concentration of economic power to the common detriment;
- Control of monopolies; and
- Prohibition of monopolistic, restrictive & unfair trade practices.

Where as the theme areas for the Competition Act, 2002 are as follows:

- Prohibition of anti-competitive agreements;
- Prohibition of abuse of dominant position;
- Regulation of combinations;
- Competition Advocacy;

Competition Act, 2002 shall prohibit anti-competitive agreements and abuse of dominance and regulate combinations (mergers amalgamations or acquisition) through a process of inquiry. It shall give opinion on competition issues on reference received and is also mandated to undertake competition advocacy, create awareness and impart training on competition issues. Going by simple rule of demand & supply, if demand for one good is rising then supply correspondingly is increased to match the demand. However, this is not possible for the Aviation sector as capacity cannot be augmented in response to demand. Airports have a fixed capacity and in terms of their ability to handle traffic. In absence of alternate airports, the major metropolitan airports are becoming congested and are constrained in terms of capacity. Now this may act as a barrier to entry for new entrants as there is acute shortage of slots, ground handling and others. This might act as an entry barrier in the current regime where slots' allocation is based upon grand fathered rights. Slots are rights to take off or land at particular time of the time. The issue of slots is important as the existent carriers may shoo away competition by taking advantage of the capacity constrained airports.

Abuse of Dominant Position: Competition Issues and Challenges in Indian Civil Aviation: Indian Civil Aviation in the past seventy or so years has witnessed three different phases, starting from the initial private regime followed by years of nationalization and the recent era of deregulation. The current de- regularized system, with its inherent competition, has succeeded in providing better consumer services. On the other hand, this has posed several challenges to the competition policy framework, calling for a need to strike a balance between protecting the interests of consumers and hence ensuring free and fair competition.

Areas which need the attention of legal fraternity and policy makers include measures to combat abuse of dominant position, encompassing:

- Predatory pricing
- Denial of market access
- Loyalty Programmes
- frequent flyer programmes
- corporate discount schemes
- travel agents commission

At the first level the paper will focus on the issues relating to abuse of dominant position by airline operators and air navigation service providers. At the next stage an attempt will be made by the authors to examine certain practices adopted by the airlines such as predatory pricing, denial of market access and loyalty programmes which have an adverse effect on the competition in the industry.

This paper will analyze the position of law in India and the existing infirmities to it in this regard. The paper will draw insights from various international instruments like Chicago Convention, 1944, the International Civil Aviation Organization (ICAO) and International Air Transport Association (IATA) and de-regulation laws of various jurisdictions like USA, Australia, Mexico, Canada and European Union which are in consonance with the international law regime and the applicability of the same in the Indian scenario will be examined in detail.

Based on the above appraisal of the current scenario the paper will draw conclusions on the need of a comprehensive policy or the substitution of draft Civil Aviation Policy, 2000 that can assure a conducive competitive regulatory framework for encouraging entry and participation of private airlines and privately run airports with special reference to update policies, guidelines and other regulatory instruments to address recent changes

The Indian Aviation Sector has witnessed tremendous growth in the recent past which is driven by sound demographic, macroeconomic, government aided reforms & market dynamics. The three fold increase in consumerism, rising disposable income; booming aviation sector; burgeoning middle class; increasing business travel; government reforms; entry of low cost carriers; increasing competition etc. have positioned the Indian Aviation

Sector in a High Growth Trajectory:

In order to maintain this high growth trajectory, it is very important that competitive forces must continue to operate with in this sector. In this report my focus shall be on the competition related issues surrounding Airlines with special emphasis on M&A in light of Competition Act, 2002.

Unlike other industries, capacity in the aviation sector cannot be immediately augmented in face of rising demand. Airports have a capacity constraint binding on them in terms of the landing, take off facilities, air traffic controllers, refueling, maintenance, clearing & catering services etc. It is this capacity constraint that might act as an entry barrier for new entrants. Landing & take off rights are referred to as Slots. These slots are an important consideration for an entrant as peak timed slots register higher passenger load factors as compared to the oddly timed slots. With most of the country's trunk route airports hitting their capacity mark, only oddly timed slots may be available at major metropolitan city airports to a new entrant which discourages new entry.

There are some regulatory barriers inherent in our domestic air transport policy which may constrain new entry & have anti-competitive effects. While the regulations governing minimum fleet size, minimum equity requirements, and route dispersal guidelines to the domestic operations are act as an entry barriers; the regulations governing minimum fleet & experience requirements for International Operations & exclusive right to National carriers to fly to Gulf Routes etc. are highly discriminative & are constraining new entry & strengthening the incumbents position. The current regulations seem to favor only the incumbents namely Air India-Indian Airlines and Jet-Sahara. None of the other players are allowed to operate internationally. Given that maximum passenger load factor is registered on Gulf Routes, the exclusive right given to the national carriers is highly a restrictive practice.

The Indian aviation sector has witnessed tremendous growth in the recent years driven by a combination of macroeconomic; demographic; government reforms and market lead dynamics. Ever since 2003, growth had witnessed tremendous increase post arrival of LCC's. Hence if the current growth trajectory is to be preserved, it is very important that competitive forces must continue to operate in the system. There are some factors intrinsic to the aviation industry that are anti-competitive. For example: Frequent Flier Programs which airlines use to discriminate between the leisure travelers and business travelers. The business class is a huge attraction for the FSC as they have very low price elasticity of demand, which the carriers want to capitalize on. Similarly other loyalty programs include Travel Agent Incentive Schemes where by the commission given to the travel agents are tied to the sales of that Carrier. Price transparency in the system of fare declaration is both a boon as well as a bane. A bane as it enhances chances of collusion. Parties entering in a collusion find it easy to ensure cooperation as the follower will implement the price increase only after seeing the leader make the agreed changes. If any one deviates then the other airline can at a very short notice revert back to the original prices without bearing much cost. So it's a win –win situation. Slot constraint is another problem constraining new entry. Landing & take off rights are referred to as Slots. These slots are an important consideration for an entrant as peak timed slots register higher passenger load factors as compared to the oddly timed

Another important issue that needs to be highlighted is that post Jet-Sahara Deal & IA-AI deal , the number of players serving the International Routes has reduced to half as no other domestic player is eligible for flying Internationally as per the current regulatory framework. Though the later entrant have given the incumbents a run for their money & have taken away a major chunk of domestic market share from these Incumbents by matching their networks and services but they are still barred from joining the International Skies. Ever since 2003, post their entry in the Aviation Sector, benefits have trickled down to the consumers in terms of low fares. What is even more disheartening is that new International players with scanty fleet size & minute experience are allowed to operate in & out of the country but ironically the domestic players who are much better in terms of safety, experience are barred from flying the same International Routes.

Thus, after seeing all this we can say that Competition is a process of rivalry between suppliers seeking to win business. It is essential to a healthy economy and a well-functioning market place but competition by itself may not necessarily deliver the best outcomes. Legislators and judges have long recognized that there are boundaries within which competitive conduct should be supported, and beyond which it should be punished. These boundaries help define the somewhat amorphous law of unfair competition. The main concern that continues to prevent precise definitions is that there are simply "too many unfair practices to define," given the fact that"there is no limit to human inventiveness in this field." Thus, fair competition which requires the prevention of unlawful acts and acts contrary to honest practices can be best explained as competition based on the factors of price, quality, and service; not on the abuse of near-monopoly powers, competitor bashing, predatory pricing, etc.

OPERATION OF CODE SHARING AGREEMENTS

The aviation industry is facing immense pressure from customers due to increased demands. Such demands cannot be met by a flight carrier due to significant problems such as a limit on licenses and resources. Hence the civil aviation industry in pursuance of the principle of co-operation, which is parallel to that of competition in any industry, has devised the concept of Code Sharing Agreements.

Code Sharing/Codeshare Agreements simply put refers to an arrangement in the form of contract between airlines to sell space on each other's flights. Such flights are displayed as flights for both the operating carrier (the airline that uses its aircraft for the flight) and the marketing carrier (the partner airline that sells space on the operating carrier's flights). Such agreements intend to address the aforementioned problems by providing a greater number of destinations and flight choices that can be conveniently booked through a single source.

The players in the Indian Civil Aviation Industry in a bid to compete in the international arena have entered into such agreements. The implications of these are several and multi-faceted. The paper aims to analyze these aspects and their operation in the Indian Civil Aviation Industry.

The paper structures itself around the issues of

- Uniformity in relation to
- Services
- Form of agreement
- Profit sharing and consequent assumption of liability
- Applicable Legal Framework to the issues mentioned with specific reference to the need for a specific legal framework.

THE EMERGENCE OF CODE-SHARING AGREEMENTS: A LEGAL PERSPECTIVE

The liberalization of the aviation industry in India has precipitated the boom for domestic and international air carriers. With the concept of code-sharing becoming popular among Indian carriers especially now that the domestic private carriers can fly overseas once they complete five years of domestic operations in addition to other mandatory requirements, legal liabilities are bound to increase and become complicated.

Code sharing involves one airline advertising and selling the services of another airline as its own and the transportation of passengers and cargo on an airline other than the one identified in the travel documents. The carrier performing the flight is usually referred to as the operating carrier while the other airline is typically identified as the marketing or contracting carrier. Code-Share agreements enable airlines to increase their traffic and revenues thereby profits, network size, service frequency, offering more destinations through its frequent flyer programmes and coordination of operations.

In order to identify the proper defendant claim arising from a code-shared flight, the Guadalajara Convention, which was adopted in 1961, applies to which India is a party. It ensures that a carrier performing carriage without having entered into a contract with the passenger will be liable according to the Warsaw Convention as modified by the Guadalajara Convention. This convention has formally introduced the distinction between a contracting and an actual carrier. As per this convention, both carriers will be jointly liable and the plaintiff is released from the difficulty in proving which carrier caused the damage which could be due to lost baggage, delay in the flight taking off, diversion of the flight due to unavoidable circumstances, passengers been offloaded due to overbooking .etc. especially in congested airports. Jet Airways already has a code-share agreement with Brussels Airlines in order to give its passengers wider destinations in Europe to choose from.

Thus the role of the Guadalajara Convention will increase and become more important with a steadily growing number of flights under Code-Sharing agreements.

FREQUENT FLYER PROGRAMS AND CODE SHARING ALLIANCES: COMPETITION CONCERNS

There are certain factors intrinsic to airline industry that are anti-competitive such as 'Frequent Flyer Programs' ("FFP's") operated by various airlines that is a form of unfair pricing practice and can have adverse effect on competition. Also, the airlines alliances in the industry that inter alia include 'Code Sharing Agreements' tend to restrain competition in the market. The object of

the paper is to study nature and impact of Code Sharing Alliances and FFP's on competition.InIndia, many airlines such as Indian Airlines, Kingfisher, and Jet Airways operate FFP's for its customers and provides various benefits in relation to same. FFP's are basically loyalty inducing programs offered by airlines which rewards customers with free travel on the basis of build up miles and gained points on each travel by that airline. Through these FFP's, the airline tends to enhance the value of subsequent flights on its airline by increasing opportunity for free travel, once the customer flies on FFP.

Such rewarding tends to induce future loyalty among customers and not only strengthens airline's market position, but also tends to fetter competition in market by making it difficult for new entrants to enter market and expand. Such loyalty inducing pricing and rebates programs become abusive when they lead to foreclosure effects. Section 4 of the Competition Act, 2002 ("the Act") prohibits abuse of such dominant position by an enterprise by way of imposition of unfair or discriminatory price in provision of services or by limiting or restricting market. Such loyalty programs also prevent customers from accruing most advantageous offer at a given time thereby denying market access. Further, airlines by way of FFP's raise the switching costs between various airlines –they make traveller keen to continue its services such that, if they switch to another they would not be able to gain points and thus free travel. Switching costs act as barrier for entrants to gain market share and are detrimental to competition in market. Also, the inducement caused by way of FFP to customer by the airline has the effect of stipulation to purchase exclusively from that airline and is related to the law prohibiting exclusive purchasing agreements. FFP's are basically targeted for business class travellers who have less price elasticity demand and therefore treat customers in discriminatory manner over other leisure travellers. Such discriminatory pricing is prohibited under the Act.

In the air industry, alliances constitute a framework for cooperation between airlines such as Code Sharing Alliances that allows one airline to sell seats under its own name and code on another airline's flight. However when two main competitors in the market enter into such code share agreement on overlapping networks, it dampens competition which may also lead to price collusion and rise by the two airlines. For example in 2006, Air Deccan signed an alliance with Jet Airways for code sharing and pooling engineering resources. This Jet-Sahara-Air Deccan alliance can have severe impact on competition as both of them have a very heavy domestic presence and overlapping networks with a combined market share of over 50 per cent, which may lead to monopoly on some routes.

Further, if Computer Reservation System displays each alliance partner's flight under each partner codes, independents or entrants shall have more difficulty in getting their flights listed prominently. Also, considering the issue that customers may be unaware of code sharing when purchasing ticket and may find themselves on carrier which they consider to offer low quality of service and would not have been willing to choose, it can be said that code sharing operations act as detrimental to fundamental issue of transparency in consumer information and interests.

To conclude, competition in airline industry could be preserved and enhanced through, inter alia, close and careful review of FFP's and such alliances and careful use of remedies to offset such

anti-competitive effects. Remedies such as, requiring incumbent airlines to grant new entrants access to their FFP and control on merging airlines to keep their FFP separate and in case of code share alliances, to assess such alliances on the basis of increase in fares and elimination of competition on the basis of market power or network effects, that should be discouraged and also pro competitive effects of economic efficiencies that can outweigh potential competitive harm.

LOW COST CARRIERS (LCCS) IN INDIA

India with more than a billion population shares only 0.3 per cent of the world's aviation production and 0.013 per cent air travel per capita. The concept of low-cost regional airlines, tried and tested successfully in several developed countries, is perhaps India's best bet, in view of the projected growth of the economy and the improvement of infrastructure. However, the success of a low-cost airline would depend on the active support, particularly in the form of economic packages, from the government.

This paper seeks to establish the essentiality of preferential and subjective treatment towards the Low Cost Carriers (LCCs) considering the different economic purposes served by them, minus such treatment the nation would soon experience the extinction of LCCs. The Paper tries to explain this issue through the recent example of the Government's proposal to levy a User – Development Fee (UDF) at the two new Greenfield Airports in the country, which has caused a furor both amongst airlines and passengers. The rising fuel surcharge prices combined with a UDF ultimately make domestic flying no longer a celebrated low – cost affair.

Ironically, there are no legal mechanisms in place to govern fuel surcharge. Therefore, passengers and airlines are often left with no recourse but to cough up the charges. In the context of multiplicity of operators and the possibility of them forming a cartel, the need of the hour is an appellate authority which could look into grievances with regard to fixation of tariff rates, fuel surcharge etc. This paper addresses the need to create an Airport Regulatory Board comprising representatives from the Civil Aviation, DGCA along with airline operators. There must also be legislation for the conversion of the DGCA into a Civil Aviation Authority with full powers over regulation over civil aviation.

The 'New Wave' in the Airline Industry: Public-Private Partnership, Foreign Investment and LCCs: The liberalization of aviation industry in India has precipitated the boom for domestic and international passenger carriers, with domestic and international passenger and cargo traffic growing at enormous rates rates, across 122 airports currently being managed by the Airports Authority of India. This substantial growth of Indian aviation industry is mostly due to: (i) low fares offered by Low Cost Carriers (LCC) like Deccan, Spicejet, GoAiretc; and (ii) Scheduled domestic air services are now available from 75 airports as against just 50 earlier. Thus, both Low cost carriers, and the expansion of airports form a large part of the growth of the aviation industry. In this paper, we try to examine both recent trends, from the lens of foreign participation through FDI, and Private-Public Partnerships in the Construction/modernization of airports, and examine the implications thereof, primarily for Low Cost Carriers, which are a major reason behind India's growth in the domestic aviation industry.

The Aviation Sector was however, not always this open. Before the 1990s, there were just 9 private airlines in India. The liberalization process began in the 1990s when India adopted an 'open skies' policy with respect to aviation. The liberalization process reached its peak in the 21st century, when, in 2006, the vide Press note No. 4, the FDI cap in Greenfield airports was lifted to 100%, on the automatic route and for existing projects also to 100% on the automatic route, subject to Government approval for investment above 74%. In 2008, vide Pressnote No. 4, this was modified so that the FDI ceiling in Scheduled Air Transport Services was set at 49% and investment therein by Non-Resident Indians at 100% on the automatic route, and the ceiling for Non-Scheduled Airlines at 74%, with NRIs being allowed to invest upto 100% on the automatic route. It was this opening up of the aviation market that heralded the change we see airports, with the modernization of the Delhi and Mumbai airports, as well as the construction of new international Greenfield airports at Hyderabad and Bangalore. These new developments have involved public-private relationships, such as the one with the GMR in the modernization of the Delhi Airport.

But over the last few years, one major effect of the liberalization of the aviation sector and the entry of foreign players in the aviation market has been the overcrowding of the competitive market. As a response, in April 2007, the Ministry of Civil Aviation raised of the minimum equity capital requirements for Airline carriers to start or continue operations, from Rs. 30 crores to Rs. 50 crores for Airbuses and Boings. The main reason and effect of this is that small players, such as the Low Cost Indian Carriers are kept at bay.

Thus we see two processes going hand in hand. One the one hand, there is the introduction of foreign players in the aviation market, leading to airport modernization/expansion/construction, while on the other we have Indian players, particularly the Low Cost Carriers being unable to compete with the high competitive equity requirements, and thus being pushed out of the market. We propose to study the implications of this paradox, i.e. the effect of the privatization and liberalization policy on airports [i.e. the construction of new airports] and the effect of the same on Low Cost Airlines [i.e. them being pushed out of the market].

Thus, we will first examine this privatization process and trace the evolution of the Foreign Investment in the Indian Civil Aviation Industry. Then, we will study the nature of such investments, particularly with respect to the Private-Public Partnerships in modernization of the Delhi Airport, and the construction of the Hyderabad Shamshabad airport. This will be done keeping in mind the revolution of sorts brought about by the low-cost airlines, and the negative effect on these airlines by the recent spate of privatization. We conclude that although the opening up of the aviation industry to foreign investment, particularly in the construction and modernization of airports in commendable, such policies should not be at the cost of the Low Cost Carriers, as they currently seem to be.

CONCERNS OF CARTELIZATION AMONG AIRLINE COMPANIES IN INDIA: LEGAL ISSUES.

'Cartelisation' is a process where enterprises collude to fix prices, limit or control production, share the market or customers, or indulge in collusive bidding. Cartels usually operate in secrecy

due to which these are hard to detect, or successfully, investigate and prosecute and because of this competition laws across the globe reserve their most severe treatment for cartels. Almost all the sectors, including the aviation sector are prone to Cartelisation.

Cartelization is when enterprises collude to fix prices, indulge in bid rigging, or share customers. Cartels have the capacity to adversely affect consumer welfare and the economy of a country. The most common activity undertaken by cartels is price-fixing which eventually results into artificial increase in prices.

Chapter IV of the Constitution directs the State policy in matter of concentration of wealth, welfare of consumers' vis-à-vis Fundamental Rights (under chapter III). It is in pursuance of this that the State enacted the Monopolies and Restrictive Trade Practices Act, 1969. This Act has now been replaced by the Competition Act, 2005. But critics opine that this Act is riddled with loopholes that might condone hard-core cartels and predatory pricing. Section 19 of the Competition Act, 2002 provides that Competition Commission of India may inquire into any alleged cartel (anti-competitive agreement) on receipt of any information from any person, consumer or their association or trade associate.

In case of the airline industry, though there hasn't yet been any proved case of cartelization, there have been concerns regarding the same in the recent years. To illustrate, in the last month there had been a case of simultaneous hike in air fare by a majority of airlines. Accordingly, the Directorate General of Civil Aviation (DGCA) sent letters to all domestic carriers seeking information regarding the hike. Most of the airlines denied any attempt at cartelization in press statements. Subsequently, the prices were rolled back.

In the light of the fact that the Competition Act hasn't been yet enforced, that the powers of the Commission under this Act are milder and more advisory than the powers under the previous Act, that very few cartels were prosecuted under the previous Act, this attempt at cartelization will raise legal issues of the sufficiency and adequacy of the Competition Act, effectiveness of the new regime and the condition of consumers' interests in the absence of enforcement of the Act.

The aviation industry in India has undergone a sea change from the times when it was the domain of the public sector. Today, the aviation sector is predominantly about the oligopolistic competition among privately owned firms vying for maximum profits.

Two years ago, the privately owned firms decided to reduce fares so as to increase the catchment area and include the common man in their customer base. This cutthroat competition forced the companies to decrease their fares to such an extent that they ended up incurring losses.

In such a scenario it is but obvious that the airline companies would devise plans to pull themselves out of this rut, and since the lack of innovative ideas plague the aviation industry, the firms would come out with methods which have been tried and tested through the course of history. Cartelisation is one such method which the Indian private airlines seem to be following.

Several economic studies and legal decisions of antitrust authorities have found that the median price increase achieved by cartels in the last 200 years is around 25%.

The result of this cartelisation is the increase in air fares among all the privately owned airlines along with other measures, with "route rationalisation" being one of them. This increase in air fares across the board has been a lot in the news lately with Jet airways and Kingfisher being accused of forming a cartel and increasing air fares which both the firms have vehemently denied blaming losses being incurred by them due to market forces and also the rise in price of Aviation Turbine Fuel (ATF), thus justifying the increase in fares.

According to Sections 33 (i) (d) and (j) of the MRTPC Act, 1969, the privately owned airline firms have violated the law if they have formed a cartel and involved themselves in a restrictive trade practise.

The paper would seek to establish if there is indeed a cartel existing between the two major players in the Indian Civil Aviation Industry, Kingfisher and Jet Airways. And if so, is it really as bad for the economy and the consumers, as it is made out to be, keeping the legal repercussions of the same in mind. The paper would also look into the pros and cons of both the existence and absence of such a cartel, from the perspective of the airlines as well as the consumers.