

Why telecom sector is regulated?

Since the beginning of the telecommunications revolution that followed the invention of the electric telegraph and the telephone during the 19th century, telecommunication networks have hardly been confined within national boundaries. To a great extent, it is apparent that one of the fundamental goals for the development of the early telecommunications industry was to provide channels for the fast delivery of communications between parties in different countries. This has been taken further by the evolution of modern telecommunication networks into a global network of networks connecting individuals, organizations, and businesses as well as national and international critical infrastructure. Thus, telecommunication networks are inherently transnational and borderless in nature. This natural characteristic of telecommunication networks has underscored the need for cooperation between countries in the development of telecommunications and also provided the basis for the development of relevant international regulatory regimes. Accordingly, it has been aptly noted that “from a legal perspective, the transnational nature of telecommunications has demanded considerable coordination and cooperation between countries, which has mirrored their regulation at the international level”.

Professor Ian Walden also captured the essence of international telecommunications regulation when he observed that the nature of the telecommunications industry “demands the construction of communications links across jurisdictions subject to both domestic and international law” which has made the industry to be “subject to Treaties and Conventions established under public international law for the treatment and use of common natural resources, specifically the law of the sea and outer space law”. Therefore, a major reason for the development of international telecommunication regimes is to regulate the usage of areas or territories such as the moon, the outer space and the sea by either State or private actors for the purpose of telecommunications. Another major reason that has spurred the international regulation of telecommunications can be traced to the overwhelming significance of telecommunications to the globalization of trade. For example, telecommunications is now considered as “a distinct economic activity, a trade service, rather than simply as a medium or conduit for conducting trade”.¹

¹ International telecommunications were based on bilateral relations between countries. The monopoly operators in those countries collaborated in the joint provision of international services. This model is now breaking down, and a new pattern based on global competition is emerging. Now, it is not nations that trade with other nations, but companies and individuals that conduct trade with each other.

Defining Telecommunications

“The essence of all communications systems is that a message is exchanged between a sender and one or more receivers”. The term ‘telecommunication’² is derived from a compound of the Greek word tele (τηλε-) which means ‘distant’ or ‘far off’ and the Latin word commūnicāre which means ‘to share’. However, the term was first coined as a French word - télécommunication in 1904 by Edouard Estaunié, a French writer and engineer. Generally, telecommunication’ is used to refer to communications that involve the electronic transmission of information over long distances. According to Newton’s Telecom Dictionary ‘telecommunication’ refers to “the art and science of communicating over a distance by telephone, telegraph and radio [which includes] the transmission, reception and switching of signals, such as electrical or optical, by wire, fiber or electromagnetic means”.

The International Telecommunication Union (ITU) has proffered a broad and more technical definition of ‘telecommunication’. In this respect the Constitution of the ITU defines ‘telecommunication’ as:

“any transmission, emission or reception of signs, signals, writing, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems”.

The above definition by the ITU attempts to broadly cover all critical elements of any activity that may be classified within the scope of telecommunicating. Accordingly, the ITU’s definition of telecommunications can be classified into the following elements:

(a) the transmission of signs, signals, writing, images, sounds or intelligence of any nature by wire, radio, visual or other electronic – magnetic systems;

(b) the emission of signs, signals, writing, images, sounds or intelligence of any nature by wire, radio, visual or other electro-magnetic systems; and,

(c) the reception of signs, signals, writing, images, sounds, or intelligence of any nature by wire, radio, visual or other electro-magnetic systems.

² According to the Oxford Dictionary, Telecommunication is ‘Communication over a distance by cable, telegraph, telephone, or broadcasting’. This hence accounts for a vast amount of our conversations today in the modern world.

Key Acronyms used in the Telecoms Industry

- **IP – Internet Protocol.** A set of rules for routing and addressing packets of data so that they can travel across networks and arrive at the correct destination.
- **VoIP – Voice over Internet Protocol.** This is the transmission of voice data (calls) over the internet rather than via traditional phone lines.

How do telecommunications systems work?

A very basic telecommunication system contains three parts:

- **Transmitter.** This converts the information into a signal that is suitable for transmission.
- **Transmission Medium.** This carries the signal between the transmitter and receiver.
- **Receiver.** Converts the signal back into usable information.

The internet, for example, works using this fundamental structure. The messages sent from each computer are converted into signals using a ‘protocol stack’ (**transmitter**). Here, the messages are broken down into smaller chunks of data called packets. These packets are given a port number and an IP address, changed into electronic signals, and transmitted along the phone line (**transmission medium**). A router then determines where to send the information using the IP address provided. When the packets reach the destination computer, they are reassembled into the original message sent by the first computer – by the destination computers’ protocol stack (**receiver**) – in a form that we can understand.

Modern Telecommunication Tools:

Modern telecommunications tools are Telephone (Including mobile telephony), Radio and Television, Internet, and Communications Networks (LAN and WAN). Modern telecommunications industry players produce communication equipment and deliver a set of voice, data, and broadband services using wireline or wired infrastructure of cables, networks, servers, computers, and satellites.

This industry is highly sensitive to the slightest change in regulatory, technological, and economic factors and has its own share of challenges. With wireless and broadband providing the needed momentum to their growth, the industry players adopt unique strategies to overcome these challenges and move forward to connect people to people and organizations.

<https://www.youtube.com/watch?v=hhR0JDzxqSI&t=45s>

Telecom Global Market: The telecoms market size is expected to reach \$3450 billion by 2022, growing at a CAGR of around 6%.

https://www.thebusinessresearchcompany.com/infographimages/190826_Global_Telecoms_Market_os082.png

Competitive Landscape of the Telecoms Market: The telecoms market is relatively fragmented with small numbers of large entities which command significant market shares and large numbers of small entities with minor shares. Major players in the global telecoms market include Apple, AT&T, Verizon communications, China Mobile and Samsung. Apple Inc. was the largest competitor in the telecoms market in 2018, with about 6% share of the market. Its products include phones, tablets, music players, laptops, desktops and TVs. Its consumer and professional software applications include the IOS and OS X operating systems, iCloud, and accessories, service and support offerings. The company also has iTunes Store, App Store, iBooks Store, and Mac App Store through which it sells its digital content and applications.

Telecoms Market Segmentation: The global telecoms market is further segmented based on type of product and geography.

By Type Of Product- The telecoms market manufacturing market is segmented into wireless telecommunication carriers, wired telecommunication carriers, communications hardware and satellite and telecommunication resellers. Wired telecommunication carriers accounted for the largest share of the telecoms market in 2018 at 45.2%. The satellite & telecommunication resellers market is expected to be the fastest-growing segment going forward at a CAGR of 8.1%.

By Geography - The global telecoms market is segmented into North America, South America, Asia-Pacific, Eastern Europe, Western Europe, Middle East and Africa. Among these regions, the Asia Pacific telecoms market accounts for the largest share in the global telecom industry, accounting for almost 36% of the global market in 2018. It was followed by North America, Western Europe and then the other regions. Going forward, Africa and the Middle East will be the fastest growing regions for this market, where growth will be at a CAGR of almost 9% and 8% respectively. This is followed by Asia Pacific and South America where the market is expected to grow at a CAGR of 8% and 6% respectively.

Telecoms Market Trends: Internet TV and focus on wireless mobile technologies are the major trends witnessed in the global telecoms market.

The telecommunications sector has seen tremendous technological advances over the past few decades, with mobility, broadband, and internet services growing in capability and reach across the globe. The International Telecommunication Union (ITU) estimates that there were over 4 billion internet users at the end of 2019, of which over 3 billion users are in developing countries. However, in spite of progress in access to internet and mobile services, many people and businesses remain disconnected. Globally, 3 billion citizens remain unconnected. And in Africa, only 294 million have internet access out of a population exceeding 1 billion.

<https://www.youtube.com/watch?v=oTMnvygIWk8&t=45s>

Potential Opportunities in the Telecoms Market: With adoption of advanced technologies and growing government initiatives, the scope and potential of the global telecoms market is expected to increase in the forecast period. The top opportunities in the global telecoms market will arise in the wired telecommunications carriers segment which will gain \$338.8 billion of global annual sales by 2022. The telecoms market size will gain the most in China at \$230.5 billion. Telecoms market-trend-based strategies include offering affordable and fast internet using Wi-Fi, 4G and 5G wireless communications technologies, and offering video-on-demand services along with fixed line services. Player-adopted strategies in the telecoms industry include increasing investments in wireless communication technologies and expanding the offerings into emerging countries³.

Potential challenges in the Telecoms Market: The market for telecom is expected to face certain restraints from several factors such as security issues and stringent regulatory environment. One of the key restraints of the market include-National security – the telecoms industry involved in the provision of national networks across the world is increasingly targeted by hackers, exposing various security issues. The hackers' main aim is to steal valuable information and use it in their own favor. Despite various measures taken by many national governments imposing stricter regulatory norms for foreign hardware manufacturers, issues concerning national security continue to rise. The extreme cases of surveillance include banning the Huawei Company by the USA, Australia, New Zealand, Canada and the UK governments to participate in the provision of 5G network hardware due to security concerns, which stemmed from the claim that Chinese government's use of Huawei's products to spy on people around the world. These security issues leading to the ban of foreign manufacturers are expected to hinder the growth of a major segment within the telecoms market, the communications hardware market in the forecast period.

³ The telecommunications services industry consists of digital infrastructure (such as fiber, telecommunications towers, active networks, and data centers), operators (mobile and fixed broadband, data centers, and cloud computing), and applications (broadband connections, telephony, video, e-commerce, and others). The sector holds promising opportunities for private sector investors.

Telecom Industry in India - <https://www.youtube.com/watch?v=f31dSc1luYk>

- India is currently the 2nd largest telecommunication market and has the 3rd highest number of internet users in the world.
- India is one of the largest data consumers globally. It has the highest data usage per smartphone at an average of 9.8 GB per month.
- With 70% of the population staying in rural areas and with rural subscribers forming 43.69 % of the total telephone subscribers of January 2020, India's rural market will be key to growth in the coming years.
- The Government of India unveiled the National Digital Communications Policy, 2018 in September 2018. The policy aimed to attract US\$ 100 billion worth of investment and generate 4 million jobs in the sector by 2022.
- The government of India launched the National Broadband Mission with an aim to provide Broadband access to all villages by 2022.

What is the market size of the Telecom Industry in India?

- India ranks as the world's second-largest market in terms of total internet users. The number of internet subscribers in the country increased at a CAGR of 45.74 per cent during FY06-FY19 to reach 636.73 million in FY19. The internet subscribers reached 687.62 million by September 2019. Total wireless data usage in India grew 10.58 percent y-o-y to 19,838,886 terabytes between July-September 2019.
- India is also the world's second-largest telecommunications market. Its total telephone subscriber base and teledensity reached 1,177.02 million and 87.45 per cent, respectively, as of January 2020.
- Gross revenue of the telecom sector stood at Rs 121,527 crore (US\$ 17.39 billion) in FY20 (April-September 2019).
- Over the next five years, rise in mobile-phone penetration and decline in data costs will add 500 million new internet users in India, creating opportunities for new businesses.

ROAD AHEAD

India will emerge as a leading player in the virtual world by having 700 million internet users of the 4.7 billion global users by 2025, as per a Microsoft report. With the government's favorable regulation policies and 4G services hitting the market, the Indian telecommunication sector is expected to witness fast growth in the next few years. The Government of India also plans to auction the 5G spectrum in bands like 3,300 MHz and 3,400 MHz to promote initiatives like the Internet of Things (IoT), machine-to-machine communications, instant high definition video transfer as well as its Smart Cities initiative. The Indian mobile phone industry expects that the Government of India's boost to the production of battery chargers will result in setting up of 365 factories, thereby generating 800,000 jobs by 2025 as per the Indian Cellular Association.

Blockchain in telecom sector: <https://www.youtube.com/watch?v=-zUbqKtJGhA>

The COVID-19 pandemic—perhaps more than any other event in human history— has demonstrated the critical importance that telecommunications infrastructure plays in keeping businesses, governments, and societies connected and running. Because of the economic and social disruption caused by the pandemic, people across the globe rely on technology for information, for social distancing, and working from home.

The sector has remained “mission-critical” to keep economies moving under the lockdown in at least three different ways:

1. Providing business-critical connectivity and resiliency;
2. Facilitating work-from-home arrangements;
3. Keeping individuals and societies connected and informed, with access to medical, financial, commercial, and other essential services during mandated social isolation.

Many telecom players—from broadband to mobile to data center operators—have benefitted from a surge in the traffic of data and voice. As a result, the telecom sector is performing well compared to other infrastructure sub-sectors.

In sharp contrast to many other industries, the telecommunication sector has been generally exempted from major COVID-19-related restrictions, such as stay-at-home orders and quarantine requirements, as it is recognized as an essential service. Some telecom companies have been strengthened by the short-term spike in data traffic and increased use of broadband services, as more people are working from home and rely on video conferencing to hold meetings.

The technology, media, and telecom (TMT) sector, however, is not isolated from short- or medium-term disruptions. General macroeconomic impacts, restrictions in distribution of airtime, and demand shortfalls from the bottom of the pyramid are beginning to have an effect. Short- and medium-term impacts could be seen across four key elements of the value chain: **network buildout, operation and maintenance, service commercialization, and financing.**

NETWORK & FACILITY CONSTRUCTION

- **Short-term construction is generally exempted from containment measures.** Given the critical nature of telecommunications, many of our clients in developing countries are permitted to carry out construction. Some of our eastern European clients report a more favorable construction environment than usual due to a surge of available workers.
- **Short-term supply disruptions are expected to recede in the second half of 2021.** The risk of further delays in shipments of network equipment is considered small.
- **Some clients may voluntarily suspend construction due to supply chain disruptions.** A lack of materials and equipment—particularly those imported from China—has prompted some clients to suspend new construction. However, affected clients are well-stocked on critical inventory. They estimate that 70–80 percent of Chinese suppliers have resumed to usual operations and are optimistic that construction can resume within 2–4 weeks.
- **Resolution of service-level agreements (SLAs) affected by production delays still unclear.** The construction cuts and delays are impacting SLAs and delivery timelines. Companies may commit to upholding offtake obligations and request compensations for delays. Alternatively, they may agree with wholesale infrastructure companies to postpone the delivery timeline or even cancel partially constructed projects. In most cases, the impact will be a change in the delivery schedule without significant penalties.

OPERATIONS AND MAINTENANCE

- **Operations and maintenance remain largely uninterrupted.** No extended period of interruption but generally confident about continuing normal service levels and operational performance. Governments across emerging markets typically allow suppliers to continue with maintenance work because of the need for connectivity during the quarantine. Mostly are well-stocked on critical inventory, which protects them from supply chain disruptions. However, if containment measures—namely, lockdowns—continue or escalate in some emerging markets beyond July 2021, the ability to maintain network quality may be compromised.
- **Service levels are not experiencing significant disturbances.** Businesses have effective business continuity plans, effective operational procedures, and supply agreements for key processes. As a result, operational performance is normal, with service levels exceeding 99.95 percent.
- **Contingency plans enable firms to manage spiked demand during the quarantine.** The data load challenge has generally been manageable. As people move away from city centers amid the work-from-home arrangement, data density has become more scattered, and thus networks have become less congested. If demand exceeds capacities, our telecom clients have the option to request over-the-top service providers (OTTs) to throttle usage, reduce speed, and lower qualities to ensure service levels.

SERVICE COMMERCIALIZATION

- **Telecom demand spikes are leading to short-term revenue upticks.** Operators—including mobile network operators (MNOs) and internet service providers (ISPs)—are experiencing an uptick in revenue from increased usage. This benefit is shared across the telecom value chain. None of the infrastructure companies reported termination of major customer contracts due to COVID-19 despite furloughs and temporary closing of businesses.
- **Continuous growth and business development are uncertain in the foreseeable future.** The lockdown has affected the movement of salespeople and distributors, significantly increasing the difficulties for new business development. Some operators are reporting reductions in retail revenue as points of sale for prepaid services are shut down, although some sales were recouped through online channels. Additionally, due to the slowdown of the global economy, most of our clients' business customers are reluctant to commit to new contracts or purchase handsets.
- **The general creditworthiness of customers has declined.** As a result of the lockdown, most high-value enterprise customers—including schools, universities, hotels, restaurants, and offices—have stopped operations and face liquidity challenges. Some customers—particularly small and medium businesses—have requested a temporary suspension of services, rebates, discounts, or payment holidays.
- **Revenues may decline due to reduced economic activity in the medium term.** Because customers generally prioritize telecom services over other expenses, the potential decline in telecom services is expected to be lower than other discretionary spending.

FINANCING

- **Foreign exchange (FX) carries the most direct financial risk.** COVID-19 and the recent decline in oil prices are putting pressure on emerging market currencies and economic growth. However, most companies have not seen solvency risks triggered by currency depreciation thus far. Neither did they encounter significant issues on the conversion of local currency to meet payment obligations offshore. MNOs will feel the FX impact immediately as their revenues are denominated in local currencies. Other companies, such as tower and data center companies, mostly have five to ten-year contracts denominated in hard currencies, but are exposed to FX risk indirectly through the creditworthiness of their MNO clients. Companies also expect significant FX effects on the price of imported network equipment.
- **Efforts to raise capital may be delayed.** Companies raising private capital are considering options to avoid drops in valuations related to uncertainties. Merger and acquisitions (M&A) activities have also stalled as buyers have become increasingly prudent in using cash.
- **The outlook in the bond market is uncertain.** Some companies have reported difficulties accessing bond markets, especially firms that are non-investment grade.

GOING FORWARD

An extended pandemic will have an increasing impact on the global economy, affecting the financial health of consumers and businesses and hence long-term demand. Mobile and broadband operators with strong exposure to retail consumers may suffer more in the short term, but the damage will eventually have an impact throughout the value chain. The impact will hinge on how long the lockdown will last.

<https://www.youtube.com/watch?v=EKFGhBKVpvM>

READ: <https://www.wired.co.uk/article/internet-connection-records-ip-act>

CONCLUSION

- The challenge of capturing the story of telecommunications law is particularly interesting and important today because of technological convergence.
- This means that once distinct technologies—for example, the traditional telephone infrastructure and the traditional cable infrastructure—can provide very similar and substitutable services, including telephone service, cable television, and broadband Internet access.
- The question of how to treat different technologies, be they telephone networks, cable networks, or wireless providers, can no longer be answered by reference to the service that those networks titularly support.
- Given that this answer was often the way such policies developed in the past, we need to answer on two levels:
 1. what is the best policy for telecommunications networks of all kinds; and
 2. in light of the legacy of policies long in place, how can the administering agency move towards the best policy (or find a second best one) if practical, legal, or political constraints limit its ability to get there?
