



NEW /EMERGING TECHNOLOGIES RESHAPING THE AVIATION INDUSTRY

Prof. Srinivas Rao Cheruku

20th August,2020



NEW /EMERGING TECHNOLOGIES RESHAPING THE AVIATION INDUSTRY

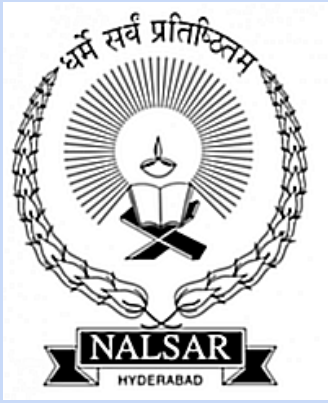
1. Data science
2. Predictive data analytics
3. Big data
4. Machine learning and deep learning



DIGITAL TRANSFORMATION

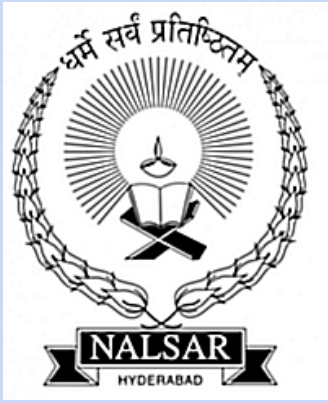
Modern cyberspace enabled by three technologies.

1. Digital computing
2. Internet networking
3. cryptography



NEXT GENERATION DIGITAL TRANSFORMATION

1. Wi-fi smart phone support
2. Loyalty
3. AI based analytics



WIFI AND SMART PHONE SUPPORT

1. Broadband access
2. On board e-commerce
3. Advertising
4. Premium on-demand content



How Digital Transformation is reshaping the aviation sector

1. Drones in Airport
2. Drones in Airlines
3. Information Technology (IT)
4. Blockchain Technology
5. Augmented Reality (AR) and Virtual Reality (VR)
6. Artificial Intelligence (AI)
7. Beacons Technology
8. Robotics
9. Biometrics



BIG DATA IN AVIATION

SIGNIFICANCE:

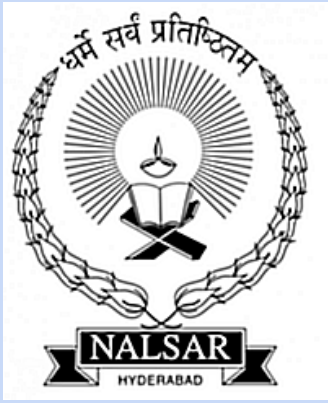
Big data is reshaping business

1. Real time access to data
2. Data fed into analytics engine
3. Analysis of data



KEY BENEFITS OF LEVERAGING BIG DATA ANALYTICS

1. Smarter maintenance
2. Safer flights
3. Improve service



CASE STUDIES

1. United Airlines
2. British Airways
3. Easy Jet
4. Southwest Airlines
5. Delta Airlines



ARTIFICIAL INTELLIGENCE

SIGNIFICANT ROLE:

1. Cutting costs
2. Design costs
3. Simulation
4. Prototyping
5. Optimization
6. Maintenance
7. manufacturing



AI PLAYS CRITICAL ROLE

1. Identification of the passenger
2. Check-in
3. Customer service agents
4. Baggage screening
5. Maintenance prediction
6. Fuel efficiency
7. Assisting customers
8. Generative design
9. SCM
10. Quality
11. Training
12. Air Traffic control



AI based predictive maintenance:

Aircraft maintenance is a tough task and if done incorrectly can cost a fortune

- Predictive maintenance
- Large amount of data being generated
- Implement accurate predictive models



AI ROBOTIC PILOT

1. Flight engineers and pilots
2. Bomber pilots
3. Ground attack pilots
4. Helicopter pilots



Machine Learning

Buzzwords: Machine Learning, Deep Learning, AI

Types of Machine Learning

- Unsupervised learning
- Supervised learning
- Reinforcement learning



THE POWER OF MACHINE LEARNING ACROSS VERTICALS

1. Technology
2. Healthcare
3. Finance
4. Retail
5. Other industries



THE POWER OF MACHINE LEARNING ACROSS TEAMS

1. HR teams fostering applicants in the hiring flow
2. Support teams using ML for call routing
3. Marketing teams using ML algorithms



SLICE DATA ANALYTICS

- Descriptive analytics
- Predictive analytics



Advances in AI are reshaping the future for Airlines

Applications/Areas:

1. Crew Management
2. Flight Maintenance
3. Ticketing
4. Passenger Identification
5. Customer Q&A
6. Baggage Check-in
7. Factory Operation Optimization
8. Aircraft Fuel Optimization



High Value Use Cases:

1. Ticket Pricing Optimization
 - Flight Ticket Prices
 - Multiple Indicators
1. Crew Management
 - Crew Manager
 - Factors affecting
 - AI based crew rostering systems
1. Customer Service
 - AI based Tools



AI, ML and Data Analytics

- Transforming Business Operation in Travel Industry
- Recommender Systems
- Predictions
- Content Curation
- User Experience Management



Transforming Business Operations

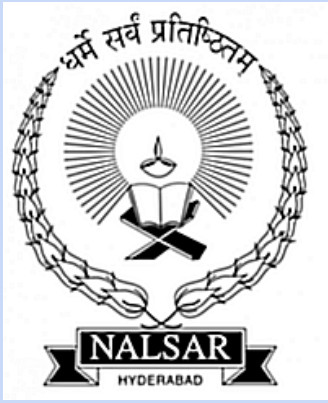
- Sales Optimization
- Price Optimization
- Marketing Opportunities
- Fraud Detection
- Customised Trip planning
- Efficient Transportation
- Language Translation
- Self Service Check-in
- Expense Tracking and Reporting



Bottom Line

Technology works well only when it is properly implemented

- Gather Quality Data
- Know your Product
- Considering maturity of business
- Focus on what matters most



Potential Transformation Scenarios

Technological Innovations:

1. Crew Management
2. Flight Maintenance
3. Ticketing System



Use Cases

- Delta Airlines- Facial Recognition Technology
- British Airways
- Singapore Changi Airport
- American Airlines
- Newark Airport
- EasyJet
- AirBus
- Allegiant Airliner
- Lufthansa
- Sparkcognition
- Emirates Vacation
- Prognosis Predictive Maintenance Software



Advantages of AI

1. Solving Complex Problems
2. Doesn't wear out early
3. Digital Assistance
4. Rational Decisions Making
5. Repetitive Jobs
6. Medical applications
7. Tireless, selfless with no breaks
8. Right Decision Making
9. Implementing AI in risky situation



Disadvantages of AI

- High Cost
- No Human replication
- No improvement with Experience
- Creativity is not key for AI
- Unemployment
- Availability of Data
- Skills of Data



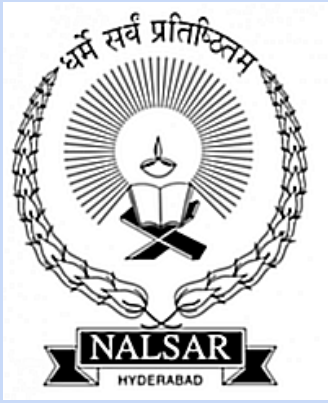
Other AI limitations

- Implementation Times
- Integration Challenges
- Usability and interoperability
- Customer privacy
- Lack of Transparency
- Technological Complexity



Concluding Remarks

- Made tasks easier
- Aviation industry VS. Software industry
- Costly Validation Process
- Data Management/Data Privacy



THANK YOU