1. MRO Business
2. Research methodology
3. Digital aviation involving MRO
4. Results
5. Conclusion
New Aircraft Generation

Big Data Analysis
Health Monitoring
Flight deck Integration
ENB

Maintenance support control
In-Flight data transmission
Post flight data transmission

New Generation E-enabled Aircraft

A350 XWB
B787
A320 Neo
B737 MAX

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Opportunities and Challenges to MRO

- Shortage of qualified staff
- Upskilling current staff
- Systems designed for 20\textsuperscript{th} Century
- Implementation of Predictive Maintenance
- New technological devices (Wearables, Tablets, RFID…)

Global Commercial Air Transport Fleet Forecast by Aircraft Vintage by Decade of Platform Launch

Source: Oliver Wyman 2017-2027 Fleet & MRO Forecast
Communication Systems

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Communication Systems Update

E-enabled aircraft
10x Data
LSAP

E-enabled organisations

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MRO Business

Types of MRO

• Stand alone
• Part of airline group
• Partners with OEM
• OEM


Smith, A. et al., Aviation MROs - Delivering long-term value in a transformed aftermarket.
Data Management Process

Data Gathering
- In-flight reports
- On-Ground reports
- QAR extraction (cellular, Wi-Fi...)

Data Storage
- OEM Data Storage
- Airline Data Storage
- Outsourced storage
- MRO Data Storage

Data Treatment and Analysing
- OEM Data Treatment Solution
- Airline Data Treatment Solution
- Software Provider Solution

Data Consumption
- Interface Software
- Airline Interface Software

Operations and Crew Improvement
- Maintenance Reliability Improvement

Operations and Crew Improvement
- Maintenance Reliability Improvement

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Impact Effort Diagram

- Tablets for Line Maintenance
- Continuous Reliability Assessments
- Inflight IP Comm
- ETL (Electronic Technical Logs)
- Data Storage Infrastructure (Internal and Cloud Solutions)
- Software Applications Integration
- LSAP Wireless Updates
- IT Skills Training & Development
- Automated MRO Documents Harmonisation
- Maintenance Planning with Health Data
- RFID (Radio Frequency Identification Device)
- Augmented Reality for Maintenance
- Continuous Reliability Assessments

EASINESS OF IMPLEMENTATION

1. MRO Business
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3. Digital Aviation & MRO
4. Results
5. Conclusion
Roadmap

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2. Research Methodology
3. Digital Aviation & MRO
4. Results
5. Conclusion

2017

Data Storage Infrastructure (Internal and Cloud Solutions)

Automated MRO documents harmonisation

On Ground Wireless / LSAP Wireless Updates

Software Applications Integration

2022

RFID

VR/AR assisted MRO

ETL (Electronic Technical Log)

CRAWL

Regulatory compliance
• Data management

WALK

Fleet reliability & availability
• Optimised RT Operations and Engineering

RUN

Fleet life and cost optimisation
• Data analysis for Reliability Engineering
• Predictive maintenance

START

10

Fleet reliability & availability
• Optimised RT Operations and Engineering

Continuous Reliability Assessments

Maintenance Planning with Health Data

Inflight IP Communication

Tablet device implementation for line maintenance

DATA
Roadmap

Skills and Capability Framework

- Aircraft - MRO Bid Information Integration

Airline
- Wireless LSAP Update
- Training and Operations Monitoring
- Provide Portable Devices To Crews

MRO
- Smart Inventory Management; Maintenance Planning and Organisation
- Digitalised Operations Monitoring
- Quality Control and Monitoring.
Conclusion

Major MRO Challenges
Prepare IT Strategy Concerning The New Generation Aircraft
Exploitation of the New Data Generated

Necessary Investment
IT Infrastructure to Implemented New Digital Aviation Technology
Re-skill and Re-tool Deliver Workforce

Digital Aviation Opportunities
Serve Expanding Market of E-enabled Aircraft
Offer Higher Value Adding Services to New Fleet and New Operators