IBM Maintenance Optimization for travel and transportation

Digital maintenance and engineering platform leveraging best-of-breed capabilities to help lower cost, reduce risk and increase speed to market

Highlights

- Leverage a digital maintenance services platform embedded with IBM's leading cognitive computing, analytics, mobile, Internet of Things (IoT) and cloud services
- Deploy flexible mobile- and web-based user interfaces that align seamlessly with your organization's unique ways of working and existing core legacy systems
- Separate user interfaces from underpinning systems, enabling IT to respond quickly to the changing needs of the business, and minimize downtime and disruptions
- Tailor technology components to best meet business needs and interlock with legacy systems
- Improve the efficiency and effectiveness of maintenance operations by unlocking the power of enterprise data

Aircraft maintenance is a core component of airline operations that helps ensure safety and reliability in the passenger experience. The challenge for maintenance organizations is the delivery of aircraft to fly on schedule while minimizing costs in a heavily regulated environment. Maintenance is generally around 12 percent to 18 percent of a carrier's budget.[1] Even small optimizations in cost structure can create large returns.[2]

Global maintenance, repair and operations (MRO) are ripe for digital disruption, as they seek new revenue streams to offset revenue loss from new aircraft generation.

The workload demand on the maintenance organization is driven by numerous factors[3] including:

- Increased retirement rate of legacy fleets with new types of aircraft that are more technologically advanced
- Demands from marketing for cabin and entertainment modifications to create on-board differentiation for passengers
- Requirements for more environmentally friendly operations, including lower carbon footprint

Modern aircraft are data-producing machines, with each modern aircraft generating over 1 terabyte of operational data from embedded sensors. It's estimated the global fleet will produce 98 terabytes of data by 2026.[4] This number is in addition to the large volumes of structured and unstructured data already generated in maintenance systems, technical logs and operating logs.

To effectively gather and act on this data, the broader aviation ecosystem must collaborate, including original equipment manufacturers (OEMs), third-party maintenance, repair and operations (MRO), and third-party spare parts providers. This new partner economy is predicated on the ability to share information, which requires a step change away from heritage IT solutions that have historically limited data access.

Improving the agility and flexibility of legacy maintenance application technology will better support rapidly changing business needs. In all MRO cases, the priority should be creating a flexible platform with a next-generation employee user experience that translates into productivity and efficiency improvements while leveraging previous technology investments.

IBM Maintenance Optimization is a digital maintenance and engineering platform leveraging cognitive and analytics capabilities seamlessly with core transactional systems. It's designed to allow maintenance organizations to deploy applications that align with the evolving needs of the business faster, cheaper, and with lower risk.

This connected, digital, end-to-end MRO platform integrates analytics, remote monitoring, smart sensors and embedded intelligence software to help create a safer, security-rich and efficient environment. All parties involved—component, equipment and human—work seamlessly to produce consistently high-quality output. By enabling asset, enterprise, unstructured and ecosystem data to be fully integrated in real time, MROs can unlock insights to monetize data for new revenues.

IBM Maintenance Optimization:

- Allows clients to retain unique solution components that are true differentiators
- Provides "as-a-service" delivery
- Offers a seamless, mobile-first user experience regardless of the underlying system
- Helps create a community data "lake" for sharing information with ecosystem partners
- Helps you build common business service application program interfaces (APIs) that augment the business value of data and improve efficiency

IBM Maintenance Optimization provides IT organizations the ability to create a sustainable, reliable and security-rich architecture for the deployment and ongoing evolution of maintenance operations systems demanded at the pace of business in aircraft maintenance and engineering. The architecture allows clients to customize the platform to leverage the best processes and technologies for their businesses, and provides opportunities for phased modernizations and enhancements.

Technical framework

IBM Maintenance Optimization has a core architectural framework that uses infrastructure and middleware technologies for common platform capabilities. It also enables modular business services to coexist with legacy systems.

This framework provides the services needed to quickly implement new or enhanced business capabilities and then operate them in a more secure and reliable manner.

In contrast to a prescriptive architecture, a framework allows each airline to:

- Select the components it needs, integrate them with what it already has and move at the pace that's right for the airline
- Separate the user experience and transactional systems, mitigating risk and operational disruption as components change

Industry solutions portfolio

A comprehensive set of cognitive, analytical, and transactional business services and applications help create customer differentiation using multiple data assets.

The solutions are pre-integrated into the framework and deliverable on premises and as a service. This solutions portfolio can help clients accelerate the modernization of legacy applications and enhance business capabilities, often at a lower cost. Differentiation is retained with common solutions, each tailored to a client's unique user experience and way of working.

The solutions portfolio emphasizes four key areas:

- Mobile enablement of the user experience
- Connectivity and health monitoring of aircraft
- Cognitive- and analytics-based preventative and prescriptive maintenance using both structured and unstructured data
- Planning optimization and visualization for maintenance and spare parts

The platform is designed to provide the means for the solutions portfolio to be deployed faster, at lower cost and at a faster speed to market than previously possible.

Future enhancements

IBM Blockchain has the potential to revolutionize MRO. IBM focuses on how blockchain can be used as a digital ledger shared by the entire aviation ecosystem, including airlines, MRO teams and OEMs, to record flight events, operational conditions and scheduled aircraft maintenance checks. This technology could be used to increase transparency about flight maintenance processes and improve efficiencies throughout the aviation industry.

IBM Maintenance Optimization brings together cognitive computing, analytics, the IoT, industry solutions and cloud services with IBM and IBM Business Partner transactional solutions. These solutions help airline maintenance organizations use technology to become more efficient and effective in delivering safe and reliable aircraft. The community platform solution helps reduce risk, lower costs and shorten time to market in comparison to traditional approaches.

Why IBM?

IBM has a heritage in designing, building and operating maintenance and engineering solutions for leading airlines and aircraft maintenance organizations around the world. As a leader in cognitive computing, industry solutions and cloud services, IBM combines world-class aviation industry and technology expertise to deliver a solution that retains the competitive differentiation of clients and acknowledges their historic investments in IT.

For more information

To learn more about IBM Maintenance Optimization for travel and transportation, please contact your IBM representative or IBM Business Partner, or visit: **ibm.com/**travel.

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1 https://www.icao.int/MID/Documents/2017/Aviation%20Data%20and%20Analysis%20Seminar/PPT3%20-%20Airlines%20Operating%20costs%20and%20productivity.pdf

2 http://www.soton.ac.uk/%7Ejps7/Aircraft%20Design%20Resources/Cost%20data/Airline%20operating%20costs.pdf

3 https://www.faa.gov/regulations_policies/policy_guidance/benefit_cost/media/econ-value-section-4-op-costs.pdf

4 MRO SURVEY 2016, MRO BIG DATA – A LION OR A LAMB? INNOVATION AND ADOPTION IN AVIATION MRO Report by Oliver Wyman

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