Connected IoT Aviation and Airplane Monitoring

AT A GLANCE:

IoT functionality enables airlines and airplane manufacturers to monitor planes in near real time for critical events. The data, gathered over numerous flights, then can be analyzed to determine long-term patterns. Reliable, secure connectivity enables the ideal solution.

For the aviation industry, the Internet of Things (IoT) allows us to connect and gather billions of data points so as to enhance and extend airplane systems management, discover new business insights, advance operations and safety, and improve the entire passenger flight experience.

The age of connectivity and big data is directly influencing, and changing, the entire spectrum of aviation services, including transportation, business / personal travel, cargo, and soon-to-be autonomous unmanned aircraft.

With the ability to connect and analyze massive volumes of data, airlines, aircraft manufacturers, as well as maintenance / repair companies, are gearing up for a revolution in flight profitability and efficiency, involving multiple aspects of the business.

Today, huge volumes of data, in the terabyte levels, are gathered on airline attributes — from passenger preference to baggage tracking to fuel consumption to systems performance.

Just for a couple of examples, using big data IoT analytics, airlines can lower fuel consumption (and costs) by up to two percent per year. Or, by reviewing this influx of data, collected from hundreds of sensors inside the engine, operators can proactively detect system anomalies or signs of developing faults, with alerts sent should any engine function leave benchmarked levels of operations. This eliminates the present requirement to overhaul a plane engine every 2,000 hours, whether problems exist or not. For large airplane fleets, this is a massive source of savings in plane maintenance and workforce labor costs. Once systems or 'things' are connected, the opportunities are near endless.

SMART AIRPLANE MONITORING

The projected size of the global aircraft fleet is expected to increase by almost 50 percent over the next few years — to more than 34,000 planes by 2025. In addition, the International Air Transport Association (IATA) estimates passenger numbers will reach 7.3 billion by 2034. To meet this unceasing demand, airplane manufacturers must find innovative ways of managing and monitoring their ever–expanding and changing fleets. That's where the Internet of Things comes into play.

IoT functionality enables airlines and airplane manufacturers to monitor planes in near real time for critical events when the aircraft is in-flight, and this information is sent via satellite.

Throughout the flight, sensors on the plane also gather non-critical information. Once the aircraft has landed, the complete data, including both the critical and non-critical information, is uploaded via Wi-Fi for detailed analysis.

IoT enables near real-time monitoring and detailed analysis of critical events. Problems can be resolved before they get worse and spread.

The data, gathered over numerous flights, then can be analyzed to determine long-time patterns and to further investigate issues identified, enabling manufacturers and airlines to gain greater knowledge of the health and performance of their fleet.

IoT / M2M Cellular Connectivity Advantages

With so much data being generated by aircraft smart devices, a robust and reliable network infrastructure is required. Significant advances in technology have made cellular network connectivity the ideal solution, with advantages that include:

◇ **True global coverage** — Cellular connectivity has gone global, even in hard-to-reach areas, enabling companies to receive detailed analysis no matter where in the world the plane lands.

◇ **Automated aircraft monitoring and reporting** — IoT enables near real-time monitoring and detailed analysis of critical events. Problems can be resolved before they get worse and spread. This increases safety and performance, as well as the fleet's life span. When planes spend more time in the sky rather than waiting for repairs on the ground, flight delays are shortened. This leads to happier customers, a trustworthy brand image, and dramatic cost savings.

◇ **24/7 analysis and support** — Data can be analyzed throughout the day, every day, and this can be coupled with support from an expert IoT provider.

◇ **Increased safety** — Near real-time monitoring of critical events, coupled with detailed analysis upon landing, creates well-maintained, efficient engine operations, reducing accidents and failures.

◇ **Complex data analysis** — On-board sensors generate a wealth of information, providing actionable insights for decision makers.

Reliable Network

Aeris, a leader in cellular IoT networks, offers an always-on service, anywhere, regardless of the amount of data being generated. This service can be utilized by airlines and manufacturers once the plane has landed, allowing complex data to be sent quickly and efficiently. In the air, Aeris uses satellites to send information regarding critical events in near real time.

1 A Single Connectivity Provider

Aeris is the only service provider that offers both GSM and CDMA connectivity for 2G, 3G, and 4G LTE, as well as non-cellular technologies, such as low power wide areas (LPWA) networks, Wi-Fi, and more. We also are carrier-agnostic — our company has agreements with more than 500 carriers worldwide, in addition to our own network. This means if our network does not reach a spot and another carrier does, we provide the strongest signal from the nearest tower, with no interruption in service. Moreover, we have a full stack of scalable IoT / M2M technology solutions to support the entire lifecycle of your deployment — from device activation through data management.

Complex Data Analysis

The Aeris solution allows monitoring of all parts of the aircraft. At Aeris, we're able to deliver a solution that is capable of handling data arriving in differing formats. In addition to this, we can provide in-depth analysis of this complex data and present it in an easily digestible format, including the web, mobile apps, or APIs.

Operational Support

At Aeris, we back our industry-leading solutions with first-class customer support. Our team is staffed exclusively with IoT / M2M experts ready to help. Aeris Infinity Support is available five days a week with ten minute response times, proactive monitoring, and issue identification.

The Flight Path Ahead

Opportunities exist today for the deployment of IoT technologies to the commercial aviation industry. Airlines, original equipment manufacturers (OEMs), and maintenance repair and overhaul providers now can gain data and guidance regarding maintenance requirements, flight operations, aircraft components and systems performance, passenger data, and so much more. These data-infused insights will create new opportunities in operational efficiencies and revamped business models, enabling the sector to reap the benefits of IoT-based solutions created specifically for planes, parts, and passengers.

ABOUT AERIS:

Aeris is a technology partner with a proven history of helping companies unlock the value of IoT. For more than a decade, we've powered critical projects for some of the most demanding customers of IoT services. Aeris strives to fundamentally improve businesses by dramatically reducing costs, accelerating time-to-market, and enabling new revenue streams. Built from the ground up for IoT and road tested at scale, Aeris IoT Services are based on the broadest technology stack in the industry, spanning connectivity up to vertical solutions. As veterans of the industry, we know that implementing an IoT solution can be complex, and we pride ourselves on making it simpler.

Visit **www.aeris.com** or follow us on Twitter **@AerisM2M** to learn how we can inspire you to create new business models and to participate in the revolution of the Internet of Things.

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