



# Diffusion® & Diffusion™ CLOUD

The Diffusion Real-Time API Management Platform™ connects businesses, people, and things, enabling companies to create digital products for new business services models and channels. The platform provides centralized, secure, and reliable data monitoring, management, and distribution among devices, systems, and applications.

Diffusion helps airlines improve processes, increase operational and supply chain efficiency, and enhance their customers' experiences -- to streamline operations, drive top-line growth and profit, and reduce bottom-line cost.

## Airline Highlights

- Leverage data and digital technologies to optimize supply chain efficiency, improve inventory management, & streamline fleet maintenance.
- Provide innovative and improved customer experiences via real-time messaging to deliver instant transaction, update, baggage, & other information to customers mobile devices.
- Enhance security by having a single point of access for application data across back-end and front-end systems, applications and devices.
- Decouple back-end applications & systems to reduce costs and innovate for top-line revenue growth.
- Enhance safety, reduced delays and deliver a better passenger experience.

The deluge of data from the Internet of Things (IoT) is shaping the future of airline operation and passenger travel.

Commercial opportunities for mobile application development are a top priority for airlines worldwide. Consumers are constantly attached to their mobile devices and want services to be provided wherever and whenever they want them. Airlines must deliver a connected mobile experience to stay competitive and differentiate their services.

The major operational costs of airline equipment and fuel are constantly escalating and utilizing IoT data and analysis to trigger timely preventative maintenance and to manage the fuel supply chain helps control these costs.

The Diffusion Real-Time API Management Platform enables organizations to create and deliver reactive applications for enhanced, personalized, engaging customer experiences; to reduce supply chain management costs; and improve operational efficiency and maintenance to protect precious fleet assets. Diffusion harnesses the wealth of data in airline systems, optimizes network resources to reduce costs and streamline operations.

Diffusion helps airlines to easily develop applications using a microservices architecture with event-driven data and decouple front-end and back-end systems, extend middleware, ensure real-time data delivery, integrate legacy system data with web, mobile, and IoT data, and deliver data fast for event processing and analytics.

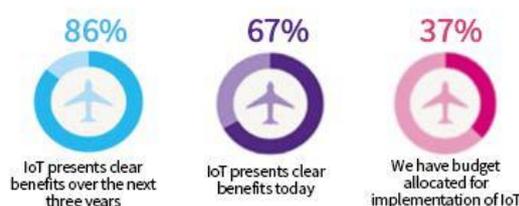
"37% of airlines already have budget allocated for IoT project development."

Source: SITA



Rethink Real-Time™

## IoT Benefits for Airlines in the Next 3 Years



Airlines are maximizing the use, performance, and management of their infrastructure for operational and passenger benefits.

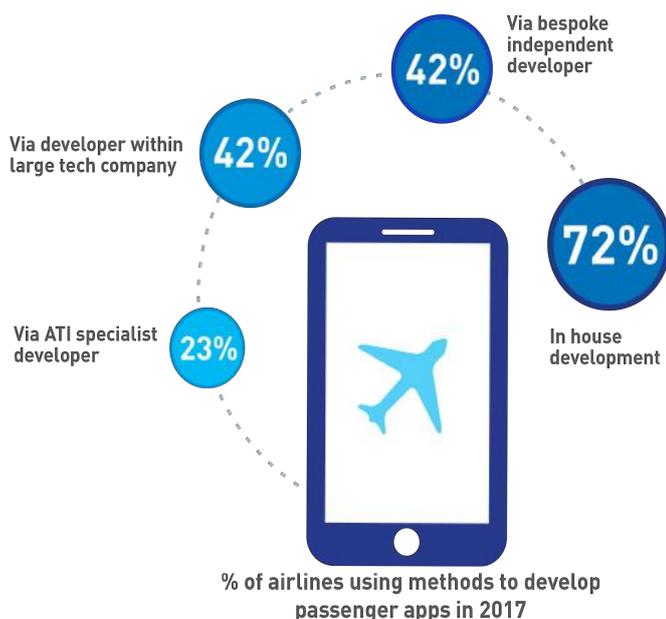
Source: SITA Analysis, The Future is Connected

## Airline Use Cases

### Customer Engagement - Smooth Travel

Today, airlines must constantly engage, serve, and deliver and track information and transactions for their customers - 24x7x365. The Diffusion Real-Time API Management Platform integrates and intelligently manages and monitors all of this data to assure an optimal customer experience and fuel airline success by delivering rich, real-time mobile experience. Airlines are developing and enhancing mobile applications and even smart watch applications for both customers and airline personnel to handle:

- Reservations, ticketing, and payment processing
- Baggage checking, tracking, & delivery
- Flight check-in services
- Flight updates and notifications
- Personalized needs-based information based upon location



Source: SITA Air Transport 2017 IT Trends Report

Diffusion is purpose built to deliver the performance and scalability required to serve customer and employee needs, integrating with existing systems and delivering data from internal systems over the Internet to web and mobile applications.

### Reduce Maintenance Expense

Airlines are implementing IoT improvements, and many of them related to the manufacturing and maintenance of planes. A relatively small passenger jet, costs \$50 million upwards and larger jets can approach \$300 million in price [source: Boeing]. Airlines must protect these investments. With IoT sensors, data is gathered and analyzed from airplane parts, engines, and the electronics. This allows the airline to better monitor the current performance of their airplanes. If an issue appears likely to occur in the near future, an airplane can be repaired before the issue becomes a major problem. This reduces downtime and the money spent on repairs. Early warning for the engineers improves efficiency of fleet management and reduces maintenance costs..

Virgin Atlantic has embraced this IoT use case and is producing a new fleet of Boeing 787 planes and cargo equipment with IoT devices connecting everything from the engines to the landing gear giving them the information to address mechanical issues before they occur. Similarly, Etihad Airways in the UAE and Delta Airlines in the U.S. are using IoT technology to assure safer flights, fewer delays, and a better customer experience.

### Baggage Handling

Most air travelers have, at some point, had issues with checked baggage, be a misplaced bag, lost bag, or excessive wait time to collect their luggage. Delta Airlines took a big step towards solving this industry-wide headache by becoming the first US carrier to use Radio Frequency Identification (RFID) baggage tracking technology. Using push notifications on Delta's customer mobile app, passengers can track their baggage location from curbside check-in to baggage claim at their destination. This use case of IoT has gives Delta customers transparency and control when it comes to their baggage.

With such technology, Delta has achieved a 99.9% luggage delivery success rate - the best among US global airlines. With the advent of IATA Resolution 753, all airlines are obligated to demonstrate delivery of baggage when its custody changes, demonstrate reception of baggage when its custody changes, provide an inventory of baggage before the flight departs, and be able to exchange said delivery/reception information with other airlines. Recent compliance data from SITA regarding the new regulation indicates that only 35% of airlines are presently compliant, with 56% partially compliant, and 9% unprepared to meet the June 2018 deadline for compliance.

## Airline Use Cases

### Improve Supply Chain Efficiency

Fuel is a large component of airline operational costs, takes a huge bite out of airlines' revenue, and the cost is notoriously volatile. From month-to-month airlines never know exactly how much fuel is going to cost. U.S. domestic airlines spend a combined \$2 to \$5 billion on jet fuel every single month (Source: Air Transport Association). Diffusion can provide complete supply chain data management from refinery to wing tip to analyze, plan and control the fuel costs.

Airlines are also using IoT to reduce their ecological footprints as well as increase fuel savings. Current air navigation routes are estimated to be as much as 20% inefficient across the airline industry. Flight efficiency services analyze the flight data and weather conditions to optimize aircraft utilization and fuel usage. AirAsia has implemented one of these systems and the company projects their fuel savings over the next 5 years will be between \$30 and \$50 million - a notable cost reduction by any measure.

#### CYBERSECURITY

Airlines prepared to deal with any threats



% of airlines prepared to deal with any cyber threats today

### Cybersecurity

Cybersecurity is top-of-mind with airlines in today's Internet connected world, and the rise of IoT introduces a host of new cybersecurity challenges. According to a recent SITA report, only 35% of airlines are prepared to deal with cyber threats today. The Diffusion Real-Time API Management Platform is purpose-built as a single point-of-access for application across all systems and devices which substantially improves security and reduces the opportunity for unauthorized data and system access, and aids cybersecurity initiatives.

### Integrating Legacy IT Systems

Many airlines are constrained by legacy back-end systems, not designed for today's digital economy. Often reliant on Enterprise messaging solutions that served the internal integration needs for two decades, IT leaders are now challenged to effectively deliver the web and mobile application experience that users and employees expect today. This slows the innovation. Diffusion can help airlines introduce a reactive data layer to their existing integration architecture that delivers a platform for present and future innovation, and extends the life and utility of their previous investments.

### Conclusion

Airlines face challenges in harnessing big data and IoT including:

- Integrating new technologies into systems and hardware that may have been in-place for decades.
- Determining which technology initiatives will have substantial positive impact and which will be misdirected efforts.
- How to adapt business practices to technology changes.

Despite these challenges, airlines worldwide are embracing the benefits of big data analytics and IoT, to streamline operations and reduce costs, increase efficiency and safety, and make the airline travel experience simpler and more enjoyable for everyone involved.

The Diffusion Real-Time API Management Platform simplifies and speeds airline application development by managing, optimizing, and integrating the wealth of data exchanged among applications, devices, sensors, and systems. Diffusion provides the scalability, real-time communications, and easy integration with legacy systems, required for successful digital transformation.

*"The Internet of Things will enable a truly connected airline to be a smart airline as well, deliver exceptional customer services, and win in the marketplace."*

Pranay Das Sabre Airline Solutions