Aviation major reduces maintenance costs and risk through reliability analytics and spares provisioning

**Client**
An international airline

**Industry**
Aviation

**Business need addressed**
- Escalating direct maintenance costs and disruptions to operations
- Accurate failure/event prediction to enable repairs and spare parts provisioning

**Genpact solution**
- Reliability analytics and forecasting models based on historical data, to assess aircraft parts failure and replacement rates
- Spare parts provisioning program for just-in-time component availability

**Business impact**
- Optimized spare parts provisioning to lower aircraft on ground (AOG) risk
- Created an early warning system for failures and events that is 75% accurate
- Enhanced lead time for maintenance crews to prepare and conduct maintenance work
A leading aviation major faced escalating maintenance costs and operations disruptions due to a sub-optimal maintenance and replacement program, which was tedious, time-consuming and subjective in nature and was not equipped to provide sufficient look-ahead time for its maintenance crew, to facilitate timely repairs and parts replacement.

Genpact helped the client build a reliability analytics model based on the error messages transmitted by the aircraft’s Airplane Health Management program, five years of historical parts data, and on-ground operations information. This early-warning solution had 75% prediction accuracy, and was supplemented with a spares provisioning system which enabled the maintenance crew to complete repairs and replacements with minimal downtime, reducing AOG risk and maintenance costs while enhancing aircraft safety and profits.

**Business challenge**

**Escalating maintenance costs and a subjective repairs and replacements process created a need for holistic maintenance analytics**

Customer satisfaction in the airline industry is driven by two key parameters, safety and timeliness. Any slippage on either can seriously impact customer experience and even subject airlines to legal troubles and damage claims.

An international airline faced escalating maintenance costs (per flight hour) and time delays for aircraft maintenance, leading to negative customer experience. Its current maintenance and replacement process risked operations disruption because it was tedious, time-consuming and subjective. The airline needed a holistic maintenance analytics program to provide sufficient look-ahead time for its maintenance crews.

The airline also wanted to optimize its spare parts provisioning to lower AOG risk and reduce cash flow requirements by optimizing the on-hand parts.

The airline wanted to make data-driven decisions based on both structured and unstructured data, driven by both airborne and ground operations information. The solution also had to be scalable and flexible, while being able to analyze dynamic in-flight information for emergency situations.

**Genpact solution**

The aircraft’s airplane health management program generates periodic signals about the health and operating state of all its systems, and transmits error signals indicating the health of the aircraft and its equipment during every phase of the flight, to an on-ground team. The solution helped the airline interpret these signals and, based on historical analysis, alert the relevant maintenance crews in advance so they are ready for remedial action once the flight lands.

The analytical model predicts repairs and replacement schedules for the aircraft by running
advanced reliability assessment and failure prediction analytics on multiple years of historical data about asset failure, replacement and repairs related to the aircraft/model, along with dynamic inputs received while in flight, enabling the maintenance crew to assemble the necessary parts and stand ready to perform the required maintenance before the plane even touches down.

This system is also enabled by a spare parts provisioning solution that keeps the parts inventory at its optimum. In the case of unscheduled repairs, having the right parts is even more urgent, and the system drives the analysis of inventory levels at the various hubs and facilitates movement of the right parts, from the most optimal location to the desired location, minimizing AOG risk further, and reducing costs.

**Business impact**

Genpact’s solution significantly enhanced the lead time for an airline’s maintenance crews to prepare and complete the necessary maintenance work. It also allows airlines to store the correct and right amount of spare parts to keep their planes in the air safely. This frees up cash because airlines now have leaner and more effective inventories.

Specifically, the solution:

- Created an early warning system that is 75% accurate
- Controlled maintenance costs by optimizing the spare parts inventory
- Lowered costly AOG time and improved on-time departure rate
About Genpact

Genpact (NYSE: G) stands for “generating business impact.” We architect the Lean Digital™ enterprise through a unique approach based on our patented Smart Enterprise Processes (SEP™) framework that reimagines our clients’ middle and back offices to generate growth, cost efficiency, and business agility. Our hundreds of long-term clients include more than one-fourth of the Fortune Global 500. We have grown to over 70,000 people in 25 countries, with key management and a corporate office in New York City. We believe we are able to generate impact quickly and power Intelligent Operations™ for our clients because of our business domain expertise and experience running complex operations, driving our unbiased focus on what works and making technology-enabled transformation sustainable. Behind our passion for technology, process, and operational excellence is the heritage of a former General Electric division that has served GE businesses since 1998.

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