Industrial internet creates
the world's *most efficient airline*

AirAsia's unique no-frills business concept is an innovation that has changed the airline business forever and now this trailblazing group is harnessing cutting edge data capture and analytics technology to ensure that its low fares and market leadership for the budget sector are maintained for its customers. The AirAsia Group has the most extensive network and most frequencies to destinations around the region but with intensified competition and increased operational costs industry-wide, the company was under pressure to increase savings and enhance efficiencies; with technological support from big data analytics (BDA) and the use of the industrial internet which covers the integration of complex physical machinery with networked sensors and software, and combining it with an internet interface, has helped the airline ingest data from such machinery, analyse it in real time, and adjust operations to increase cost efficiencies. In particular, the Flight Efficiency Services (FES) provided by General Electric (GE), has helped AirAsia make those significant savings by evaluating and qualifying its savings opportunities.

Challenges

Although AirAsia still reaps the benefits of first mover advantage in several of its markets and continues to outperform nearly all of its peers, competition has intensified as other regional airlines look to duplicate its winning formula. With the airline using some 1.4 billion kg of fuel each year (or approximately 12 million barrels of fuel) and with fuel taking up 50 percent of its overall costs, optimising fuel efficiency was a primary concern. This made it imperative for the airline to boost its fuel savings as well as to optimise navigation performance and procedures.

Solution

FES utilises the power of the industrial internet to help AirAsia make significant savings by implementing precision navigation services, flight data analytics and fuel management services. The GE FES data-driven services are used to identify ways to reduce operating costs, increase aircraft utilisation and obtain savings throughout the AirAsia network; the target being the bottom-line operational savings of approximately USD30-50 million over a five year period.

> **COMPANY PROFILE**
AirAsia has sparked a revolution in air travel with an ever increasing number of people around the region choosing it as their preferred choice of air transport. With a growing fleet of more than 160 aircrafts operating in excess of 340,000 flights a year, serving a network of 100 destinations in 22 countries, the AirAsia Group has become a leading player in the Asian civil aviation market. The Group places great emphasis on attaining the lowest cost so that everyone can fly with AirAsia; the company is also focused on maintaining the highest quality product, embracing technology to reduce cost and enhance service levels.

> **CHALLENGES**
- Intensifying competition from regional airlines looking to duplicate the company's winning formula
- Optimizing fuel efficiency, navigation performance and procedures

> **SOLUTION**
- Optimise climb profiles; launch a single-engine taxi program; plan taxi and contingency fuel requirements; optimise departure tracks; and minimise the use of the plane's Auxiliary Power Unit (APU).
- Enable the aircraft to fly new efficient flight paths using Required Navigation Performance (RNP) flight paths

> **BUSINESS BENEFITS**
- 1% (or 14 million kg) in fuel savings yearly
- Required Navigation Performance (RNP) Precision Guided Approach saved 15 miles per landing.

Air Asia

The FES-AirAsia team use advanced data analytics to evaluate and qualify savings opportunities, before deploying airline and change management expertise to implement changes to operational policies and procedures, where the outcomes are measured and reported using dashboards. FES has enabled AirAsia to optimise climb profiles; launch a single-engine taxi program; use sophisticated statistical algorithms to plan taxi and contingency fuel requirements; optimise departure tracks; and minimise the use of the plane's Auxiliary Power Unit (APU).

Another way efficiency is gained is by Required Navigation Performance (RNP) which is a performance-based navigation procedure that enables an aircraft to precisely fly optimal predetermined paths by using a combination of modern flight management computers, GPS technology and innovative procedure design. The RNP paths reduce flight distances as well as help aircraft navigate safely in challenging terrain and weather.

AirAsia is the first Malaysian airline to fly new efficient flight paths using Required Navigation Performance (RNP) flight paths.

Business Benefits

The ongoing collaboration between GE FES and AirAsia in utilising data capture and analytics software has helped AirAsia save over 1% in fuel expenditure yearly so far. The approval from the Department of Civil Aviation to enable single engine taxi-in and taxi-out translates into 68 kg of fuel savings per flight; this strategy was a first for a Malaysian airline. Climb profile optimization saved an additional 21.24 kg of fuel on each flight, and the Required Navigation Performance (RNP) Precision Guided Approach saved 15 miles per landing.

The Future

There is tremendous potential for AirAsia to continue harnessing the power of the industrial internet to connect people, machines, and BDA to deliver better outcomes. In aviation, GE's integrated flight data and analytics provide insights to identify and implement sustainable fuel savings. Its patented performance analytics combine an aircraft's flight data, weather, navigation, risk data and fuel operation to provide business intelligence for significant cost savings. And its intelligent operations provide airlines and cargo carriers around the world with services focused on improving efficiency by leveraging aircraft performance data, prognostics and recovery. Clearly, efficiencies for the airline go beyond the physical engine. It is about using data and analytics to continuously identify ways to reduce operating costs, increase aircraft utilization and improve the way we fly.

About GE Malaysia

GE's footprint in Malaysia began in 1975 with a sales and service centre. Today, GE is present in several major locations (Kuala Lumpur headquarters and an aircraft engine maintenance, repair and overhaul Centre of Excellence in Subang) as well as key customers sites throughout the country providing employment to over 700 employees. All of GE's key businesses (Oil and Gas, Power and Water, Energy Management, Aviation, Healthcare, Transportation and Lighting) are present in Malaysia. The Kuala Lumpur office serves as the company's ASEAN corporate headquarters as well as the Asia-Pacific headquarters for GE Oil & Gas. The company has been supporting the development of the nation across multiple industries and has the depth and breadth to support the different areas identified by the Government under the Economic Transformation Programme to propel Malaysia towards high income status by 2020. GE has invested over RM1billion in Malaysia since beginning operations, and is committed to contributing to the nation's sustainable development and prosperity, investing in its future as a trusted and committed local partner, with advanced technology solutions and services.

> **CONTACT INFORMATION**

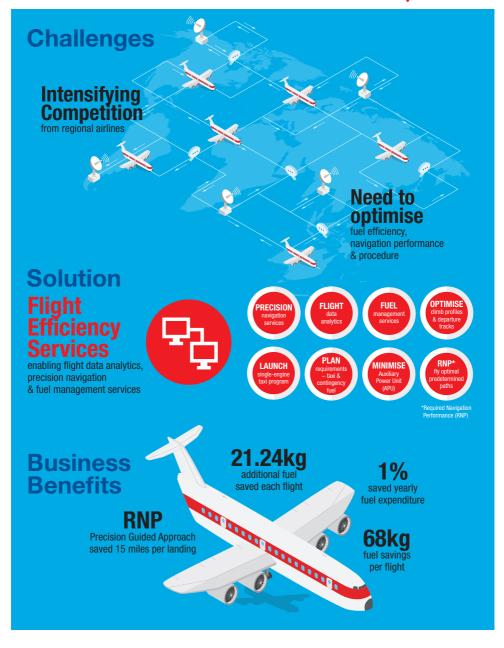Visit www.ge.com/my for more information.

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Air Asia

Challenges

Intensifying Competition
from regional airlines

Need to optimise
fuel efficiency, navigation performance & procedure

Solution
Flight Efficiency Services
enabling flight data analytics, precision navigation & fuel management services

- **PRECISION** navigation services
- **FLIGHT** data analytics
- **FUEL** management services
- **OPTIMISE** climb profiles & departure tracks
- **LAUNCH** single-engine taxi program
- **PLAN** requirements – taxi & contingency fuel
- **MINIMISE** Auxiliary Power Unit (APU)
- **RNP*** fly optimal predetermined paths

*Required Navigation Performance (RNP)

Business Benefits

21.24kg additional fuel saved each flight

1% saved yearly fuel expenditure

RNP Precision Guided Approach saved 15 miles per landing

68kg fuel savings per flight