AIRLINES IT TRENDS: REPRESENTING OVER 55% OF GLOBAL PASSENGER TRAFFIC

% of survey responders in categories above

Regions
- Europe: 28%
- Americas: 14%
- Africa/Middle East: 34%
- Asia-Pacific: 24%

Passengers carried
- Up to 3m Passengers: 34%
- 3-10m Passengers: 23%
- 10-25m Passengers: 23%
- 25m+ Passengers: 20%

Completing the connected journey? | Confidential | © SITA 2016
SPEAKERS

Nigel Pickford, Director, Market Insight

Tim Anstey, Chief Architect, Cabin & Network Systems

Greg Ouillon, Chief Technology Officer
AGENDA

2016 Airline IT Trends Highlights  SITA
Operations & the connected aircraft  Boeing
Passengers & the connected aircraft  SITAONAIR

The Internet of Things

Questions and Answers
2016 AIRLINE IT TRENDS HIGHLIGHTS

Nigel Pickford,
Director, Market Insight, SITA
GROWING OPTIMISM THAT IT BUDGETS ARE SET TO INCREASE

How is your Operating & Capital IT&T spend expected to change in 2017, compared to 2016?

Operating spend

<table>
<thead>
<tr>
<th>Year</th>
<th>Increase</th>
<th>Same</th>
<th>Decrease</th>
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<tbody>
<tr>
<td>2016</td>
<td>39%</td>
<td>39%</td>
<td>22%</td>
</tr>
<tr>
<td>2017</td>
<td>52%</td>
<td>37%</td>
<td>11%</td>
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</tbody>
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Capital spend

<table>
<thead>
<tr>
<th>Year</th>
<th>Increase</th>
<th>Same</th>
<th>Decrease</th>
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</thead>
<tbody>
<tr>
<td>2016</td>
<td>38%</td>
<td>49%</td>
<td>13%</td>
</tr>
<tr>
<td>2017</td>
<td>57%</td>
<td>31%</td>
<td>12%</td>
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Which of the following self-service initiatives have you implemented in your airline?

* Home bag-tag printing not surveyed in 2015
Which of the following MOBILE-BASED SERVICES do you provide, or plan to provide, via passengers’ smartphone or tablet or smartwatch applications?
Which of the following services do you provide or plan to provide that will leverage beacons/sensors?
Airlines embrace everything as a service…

While the demand for data is about to explode…

In terms of your future IT&T investment programmes, where do you plan to apply your resources in the next 3 years?

- Cloud Services: 84%
- Business Intelligence: 91%
- Predictive Analytics: 84%
- Internet of Things: 68%
IOT TECH ALREADY ON THE RADAR FOR PASSENGERS AND STAFF

When do you first anticipate trialling or piloting the following new and emerging technologies in your airline?

- **Wearables for staff (Smartwatch / Smartglasses)**: 51% next 5 years, 39% next 10 years
- **Specific wearable-enabled services for passengers**: 53% next 5 years, 37% next 10 years
- **Single biometric travel token for identity management**: 54% next 5 years, 37% next 10 years
- **Artificial Intelligence**: 44% next 5 years, 37% next 10 years
- **Virtual reality services for passengers**: 20% next 5 years, 19% next 10 years
- **Virtual reality services for staff**: 20% next 5 years, 19% next 10 years

© SITA 2016
In terms of your future IT&T investment programmes, where do you plan to apply your resources in the next 3 years?

What is the status of the following cyber security initiatives in your airline?
Passengers are ever more connected due to Airline investment in mobile. And Airlines are recognising potential new benefits from IoT.

- IT investment is on the up
- ‘On ground’ connectedness is leading and setting expectations
- The proliferation of ‘connected things’ will bring new opportunities, …
- Big data becomes critical…
- …. as do robust cyber security measures

But how & when can the connected aircraft equally leverage the promise of IoT?
OPERATIONS & THE CONNECTED AIRCRAFT

Tim Anstey, Chief Architect, Cabin & Network Systems BOEING
AIRLINES OPERATING CONNECTED AIRCRAFT TO DOUBLE BY 2019

37% Already operating connected aircraft

45% Already operating & currently taking delivery of connected aircraft

66% Already operating and taking delivery of connected aircraft by end of 2019

What is the status of connected aircraft deliveries in your airline?
ENORMOUS OPPORTUNITY TO IMPROVE EFFICIENCY
Digital Airline (n): An adaptive, continuously optimized, real-time operation that delivers step changes in efficiency, profitability, and customer experience to drive long-term competitive advantage.
In terms of your future IT&T investment programmes, where do you plan to apply your resources in the next 3 years?

- **Electronic flight bag solutions**: 92% (R&D: 21%, Major program: 71%)
- **Equipping staff with tablets**: 81% (R&D: 31%, Major program: 50%)
- **Wireless services for crew**: 79% (R&D: 30%, Major program: 49%)
- **Equipping staff with smartphones**: 70% (R&D: 26%, Major program: 44%)
- **Wireless in-flight services for passengers**: 80% (R&D: 28%, Major program: 52%)
TRENDS & TRANSFORMATIONS

Connectivity everywhere

Unlimited resources

Hardware transition to software

Human & computer gap closing

New challengers to traditional companies
NEW AIRPLANES BRING ENTERPRISE CAPABILITY

Bringing IT to the clouds

- Advanced onboard maintenance systems
- Wireless networks for crews and passengers
- High bandwidth, low cost in-flight data links (Ku, Ka)
- High bandwidth, low cost ground data links (Wi-Fi, cellular)
- Onboard file servers, integrated ground systems
- Connected systems, large data capture
IOT ENABLED MONITORING ACTIVITIES HIGH ON AIRLINE AGENDAS

50% Manage equipment condition/consumable levels
40% Manage aircraft environment (e.g., temperature/lighting)
66% Fuel/engine monitoring to generate efficiencies
37% Tracking movement, health and status of crew

Which of these on board Internet of Things enabled initiatives will you focus resources on in the next three years?
DAY OF FLIGHT CONNECTIVITY

Connectivity in flight

Preflight:
- Review maintenance logs
- Review flight plan, weather
- Read MEL descriptions

Ramp/taxi:
- Prepopulate data on EFB
- View airport, departure charts
- Calculate take off performance
- Go through checklist

Cruise:
- Log flight progress
- Calculate landing performance
- View en route, approach charts
- Pull data from FMS to log flight progress to plan

Handle disruptions:
- Receive real time weather updates
- Updated flight plans
- Send faults to ground
- Recalculate landing performance

Post flight:
- File pilot log, journey report, final flight folder
- Send performance calculations off board
- Update maintenance records

Decision window

(roll to extend decision window)
INVESTMENT SEEN AS THE MAJOR CHALLENGE TO IOT CAPABILITIES

To what extent do you see these as challenges when it comes to developing new Internet of Things enabled services?

97% 93% 91% 90% 90%
45% 53% 41% 49% 46%

Overcoming passenger perception of lack of privacy
Initial investment in IoT enabled devices
Ongoing costs to maintain IoT enabled devices
Developing machine learning techniques
Ensuring the security of IoT devices
Connectivity is an integrated feature

High-bandwidth network access from nearly anywhere world-wide

Typically, isolated from the airplane network

Many current EFB use cases are satisfied by a ground-only connected device

Mobility enables new contexts within which to access and process information
BENEFITS FOR FLIGHT OPERATIONS

Flight crews and operations are always connected

Door-to-door workflow integration

Real-time strategic weather

Increased situational awareness

Improved flight efficiency and passenger comfort

Enhanced decision making analysis tools
Operational efficiencies are enabled by connectivity

Integrated device connectivity is adequate for many of today’s EFB applications

Integrated airplane connectivity is necessary to realize full benefits

Be process ready – take advantage of early notification to improve decision outcomes
PASSENGERS &
THE CONNECTED AIRCRAFT

Greg Ouillon,
Chief Technology Officer,
SITAONAIR
Where do you see the main challenges to deliver sales/service to passenger’s mobile devices in the next 3 years?
CONNECTED AIRCRAFT: ADDRESSING CORE BUSINESS DRIVERS

- grow ancillary revenue
- differentiate passenger experience
- improve air navigation safety
- improve operational efficiency

Broadband connectivity is enabling a new ‘long’ cycle of innovation
FROM CONNECTED AIRCRAFT TO e-AIRCRAFT™

Requires modular, integrated solutions supported by common capabilities

Onboard software and data integration

Secure cockpit and cabin aircraft communications

Ground IT, cloud, networks

Connected to all stakeholders

Content exchange and collaboration

Apps and systems integration

24*7 global service operation

Requires modular, integrated solutions supported by common capabilities

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24*7 global service operation
Delighted Passenger
Increased revenue
On-time performance
Fleet availability and utilization
Lower cost of maintenance
Fuel efficiency
Shared situational awareness
Cost-effective compliance
Increased throughput
BETTER PASSENGER EXPERIENCE IS THE DRIVER FOR AIRLINES

What is the key benefit you have gained (or expect to gain) from connected aircraft?

- Improved passenger experience: 46%
- Operational benefits for maintenance/Aircraft health monitoring: 15%
- Operational benefits for the cockpit: 12%
- Operational benefits for the cabin: 7%
CONNECTED CABIN DIRECTION

Broadband connectivity is gradually changing the approach to delivering Passenger Experience

- Ground like Internet and mobile experience
  - The satellites are here, things will always get better
  - Dynamic traffic management, shaping & filtering, profiling

- Monetizing and engaging passengers
  - Concierge, loyalty, passenger journey, sales and retail
  - Advertising and sponsoring

- Accelerating innovation lifecycle
  - Services delivered from the ground
  - Virtualizing onboard footprint with shortened software cycles

- Zero-touch content update
  - Continuous IFE and w-IFE update with O&D localized content
  - Streaming & broadcasting blending in new experience

- Passenger centric service
  - Service consistency across platforms and fleet
  - Flawless availability, globally 24*7
MORE CONNECTED AIRCRAFT ENABLES MORE CHOICE ON-BOARD

33% Today
Internet

24% Today
Multi-media file streaming

21% Today
Mobile phone

23% Today
Multi-media file streaming

19% Today
Internet

74% By 2019
Passenger devices

70% By 2019
Airline supplied devices

58% By 2019

57% By 2019

61% By 2019

Which IN-FLIGHT services do you provide or plan to provide?
The opportunity

Today’s passenger expects a consistent, high-speed internet connection at all times, even when in the air. The quality and availability of that connection can influence carrier choice.

- **85%**
  85% of passengers would use free Wi-Fi when on a plane
  Can you use this trend to build your brand?

- **69%**
  69% of passengers are actively using their personal devices inflight
  Is this an opportunity to get more personal with customers?

- **79%**
  79% of 18-44 year olds have their smart phones with them 22 hours a day
  Are you connected to your customers after they land?
MOBILE ONAIR

The opportunity

Mobile phones offer the average traveller the opportunity to remain in contact at all times. Giving your passengers this opportunity in the air makes for stress-free journeys and onward travel.

5.9 billion mobile broadband customers by 2020

Can your airline meet the consumer demand?

37% of passengers connect to the on-board mobile network

How is your airline monetizing this opportunity?

65% of connected passengers used mobile data service in 2014

How much time could you save on arranging mobile and satellite provider deals?
ONAIR PLAY

The opportunity

The vast majority of airline passengers possess Personal Electronic Devices, allowing each to enjoy tailored entertainment content on the move. With a seamless, high-speed connection on-board every passenger can enjoy varied, bespoke entertainment content.

- Top 4 activities on personal devices includes; 68% Music, 54% Games, 48% Reading, 44% Movies
- Is your airline offering the type of multimedia content passengers want?

- Millennials are now spending more time watching Television and movies on personal electronic devices
- Can your IFE content be experienced on your customers devices?

- 94% of passengers brought at least one personal electronic device (PED) onboard in the last 12 months
- Is this an opportunity to stop using IFE hardware and make weight and fuel savings?
GETTING RETURNS ON CONNECTED AIRCRAFT

The next 5 years will require focused integration across technology components and stakeholders

1. Connected? But I’m connected!

2. It’s all about data and managing end-to-end

3. Application is driving digital transformation

4. Business processes run on 24*7 global service

5. Digital transformation choices across the fleet and along the technology life-cycle
Thank you

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