Digital Aviation – Emerging Technologies

Wednesday, November 2 | 12:30pm – 1:30pm

PRESENTED BY:
Jimmy “Indy” Cho, Senior Manager, Boeing Digital Aviation - Seattle
Drew Costakis, Director, Microsoft Technology Center - Detroit
What does it mean to be Digital?
What does it mean to be Digital?

From

ASSETS

To

ASSETLESS

From

INTERNAL

To

CUSTOMER

EXPERIENCE

From

COST CENTER

To

BUSINESS

INTEGRATION

Business Models

Business Operations

Technology
Boeing and Microsoft: Taking the next step together in digital aviation

Boeing, the company that provided airplanes for the U.S. Army in World War I, delivered the first commercial jetliner in 1958 and served as the main aircraft manufacturer in the 20th century. Now, Boeing is moving ahead in the digital age to become a world leader in the use of big data and AI.

"Boeing is working with Microsoft to explore new ways to use big data and AI to improve the flying experience of our customers," said Alan Joyce, the director of Boeing’s Aviation Solutions. "Together, we hope to create innovative solutions that will help make the sky a safer and more enjoyable place to fly."
Where are the opportunities?

**Industry insights**

**Operator needs**
Continuing focus on large cabin jets with:
- Modern high tech avionics
- Faster cruise Mach .85
- Extended range in every class

**Pre-owned jet inventories down**
Has diminished slowly from a 16% high in 2009

**Operator concerns**
- Lower fuel burn
- Cabin Amenities
  - Comfort, productivity
- Maintenance Costs
  - Aircraft support, reliability, maintainability

**Fractional ownership**
- Stronger delivery performance is expected in developed economies in 2015/2016

Source: Honeywell
Possibilities

Hololens video here.
THEMES (Technology)

Mobility

Big Data

Cloud

Intelligence

BIOMETRICS

CONTEXTUAL THREAD

AUTOMATION

DIGITAL EXPERIENCE

DRONES

AR / VR
Global Data Growth Rising Fast = +50% CAGR since 2010...
Data Infrastructure Costs Falling Fast = -20% CAGR

Data in Digital Universe vs. Data Storage Costs, 2010 – 2015

- Data in Digital Universe (Petabytes)
- Storage Costs ($/GB)

Source: Gartner, May 2016
Lessons from the 2nd Industrial Revolution: Electrification


Source: Nicholas Carr - “The Big Switch”
Huge infrastructure scale is the enabler
Artificial Intelligence and Machine Learning

Competing with Algorithms
```javascript
$(this).blur();
$.doTimeout('scrollToFooter', 200);
var blinkSpeed = 200;
var shadowType = '0 rpm';
$.doTimeout('scrollToFooter', 200);
$('a#form_send').animate(' BOTH', 400);
```
Input → Algorithm → Output

Repeat many, many times
I think it's a man standing on a beach with a dog.
Computer Vision > Human Vision

Image Classification Error (%)

<table>
<thead>
<tr>
<th>Layer</th>
<th>Error (%)</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>28.2</td>
</tr>
<tr>
<td>2</td>
<td>25.8</td>
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<tr>
<td>3</td>
<td>16.4</td>
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<td>6</td>
<td>6.7</td>
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<tr>
<td>7</td>
<td>3.15</td>
</tr>
</tbody>
</table>

- Shallow 1 Layers
- Shallow 2 Layers
- 8 Layers
- 8 Layers
- 19 Layers
- 22 Layers
- 152 Layers

Human Baseline
Computer Speech ~ Human Speech
of large organizations globally will compete using advanced analytics and proprietary algorithms, causing disruption of entire industries by 2018.

Source: 100 Data and Analytics Predictions Through 2020, 24 March 2016
THEMES (Technology)

- Mobility
- Big Data
- Cloud
- Intelligence

- Biometrics
- Contextual Thread
- Automation
- Digital Experience
- Drones
- AR / VR
What does it mean to be Digital?

ENGAGE YOUR CUSTOMERS through innovative products, services & immersive experiences

EMPOWER YOUR EMPLOYEES to improve collaboration, morale, and overall team effectiveness

OPTIMIZE YOUR OPERATIONS and improve outcomes across the entire value chain

TRANSFORM YOUR PRODUCTS by harnessing data insights from today’s products to build tomorrow’s solutions