Technology Innovation

Elevating IoT sensor data towards a Digital Twin

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CWTe 2017 Research Retreat

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Internet of Things
a hype or “old wine in new bottles”?

1980’s introduced
- 1,200 sensors
- Automated event reporting
- Wireless communication

A dumb asset made smart...

2016 introduced
- 25,000 sensors
Finding my « Things »

IoT changes planning-based organization to Real Time organization

Current organization + Adding “Monitoring” + “Control” È “Insight”
Finding my « Things »
Experiments and business impact
Finding my « Things »
Experiments – Outdoor navigation - 3 Cargo trucks

3 cargo trucks equipped

Data shown is 1 day, 3 trucks
Finding my « Things »
Experiments – Indoor navigation - 2 Forklifts

2 Forklifts equipped
Data shown is 1/2 day
Building the business case
benefits of Internet of Things

Benefits Plateau

- Monitoring
- Control / Action
- Insights / Prediction
- Full process automation

AIRFRANCE KLM
E&M Equipment tracking

Where is my tool?
Catering Trolley tracking
Asset management
Connected Car

Sense elements inside and outside vehicle
Get insights to enable analytics and improvements
GS Baggage tracking
Compliancy IATA 2018
Internet of Things

RFID enabled Baggage scanning conveyor
X-Gates Baggage tracking

Visual for quick off-loading
Commercial Baggage tracking

Improve Customer experience by insight in their checked-in baggage
Opportunities

Baggage data (example only)

- Weight
- Height
- Current location
- Time handling
- Color
- Characteristic
- ULD#
- Photo

- Route length
- Transit / leg
- Destination
- Origin

- Volume
- Width
- Depth
- Height
- Weight

- Historical context data
- Historical locations

- Audit

Passenger

Operational staff

Analytics
Marketing
Law & Regulations

New Business opportunities

Samsonite
Cargo Piece level tracking

To improve compliancy
Leading to higher quality for our customer
E&M Cabin Inspection

Quick insight in status on board equipment, security, due date
Internet of Things Implementation status

- Internet of Things Core infrastructure up & running (in support of IT)
- **Front end application** available (Quick & Dirty) to find assets

LoRa IoT Devices:
- 20x Highloaders (X-Gates)
- 20x 10 ft pallet cars (Cargo)
- 20x E&M Line Maintenance equipment (E&M)
- 20x E&M Line Maintenance Van’s (E&M)
- 6x Bagmanager Terminals (X-Gates)
- 1x RFID Conveyor

Coming soon:
- 95 Catering trucks
Operational Insights

Improve employee experience by having visibility of tools and equipment at the right time and right place.
Digital Twin

- Real life objects and processes
- Vehicles and objects equipped with sensors
- Real time action

- Virtual copy of the real life objects
- Vehicles and objects position are representing real objects
- Real time action
- Can be used as:
  - Analysis tool
  - Simulation tool
  - Play “what if scenario’s”
  - Stop the real time action and replay past x minutes.
  - ...
Digital Twins
a hype or “old wine in new bottles”?

2017
Pilots acquire their license in a Digital Twin.

In theory 1st real flight is with passengers...

Data from real flights is used as trainings input

New operational Procedures and products are first tested in the “digital twin”

1976’s introduced Fokker F28 Flight simulator
Any Questions?

Royal Dutch Airlines