INTELLIGENCE FOR THE CONNECTED WORLD

2016 PHM CONFERENCE

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IOT: THE DATA DRIVEN ECONOMY

1.0 Traditional Analytics

- Data sources relatively small and structured, from internal systems
- Majority of analytical activity was descriptive analytics, or reporting
- Creating analytical models was a time-consuming “batch” process
- Few organizations “competed on analytics”—analytics were marginal to strategy
- Decisions were made based on experience and intuition

2.0 Big Data

- Complex, large, unstructured data sources
- New analytical and computational capabilities
- Data Scientists” emerge
- Online firms create data-based products and services

3.0 IoT: Fast Business Impact for the Data Driven Economy

- Analytics integral to running the business; strategic asset
- Rapid and agile insight delivery
- Analytical tools available at point of decision
- Cultural evolution embeds analytics into decision and operational processes
- Businesses can create data-based products and services

Adapted from IIA 2014
INSIGHTS AND ACTION DRIVE VALUE

Data
BIG
IOT

Analytics

Act

Value

Reduced Downtime
Lower Maint. Costs
Improved Planning
Asset Efficiency

Large
Material
Labor
Equipment
Utilization

Process

High Velocity
Complex

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TRADITIONAL IT POSITION ON ANALYTICS
ANALYTICS PLATFORM

Discovery

Deployment

Data
ANALYTICS PLATFORM – VALUE IN THE OVERLAP
INTERNET OF THINGS

IOT ANALYTICS LIFECYCLE
SENSE – UNDERSTAND - ACT

Data

Data Store

ETL

Distributed Analytics

IoT Total Value Stream

At Edge

In-Network

At Rest

Model Dev/ Execute/ Monitor

Alerts/ Reports/ Decisioning

IoT Data

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INTERNET OF THINGS

CONCEPTUAL ARCHITECTURE

The Thing level
- Thing
- Embedded analytics
- SAMs

LAN of things
- Thing
- Embedded analytics
- SAMs

Edge network
- SAMs
- Edge Analytics
- Cellular/Wi-Fi/WAN

Continuous Security Analysis

The server level
- Network Interface (incl. load balancing, etc.)
- Inbound events
- Actuate events
- Data ingestion
- Streaming Analytic Models (SAMs)
- Publish Alerts
- Storage

Visualization
- Streaming visualization
- Traditional visualization

Modeling
- Model Development
- Model Maintenance

Model Deployment
**ANALYTICS LIFECYCLE**

**DRIVING ASSET ANALYTICS**

- **Truck Fleet**
  - Correlate fault data to breakdowns and failures
  - Predict breakdowns and component failures
  - Perform reliability analysis on major parts

- **Turbine Engines**
  - Model drivers of unscheduled downtime
  - Identify optimal maintenance scheduling
  - Predict failures

- **Wind Turbines**
  - Identify turbines performing below average
  - Model drivers of capital component failures
  - Improve planned maintenance

- **Gas Treatment**
  - Identify predictors of failures
  - Identify optimal operational parameters
  - Optimize amine utilization

- **Oil Wells**
  - Identify Wells performing below expectations
  - Model drivers of pumps failures
  - Automate early-warning detection
  - Identify optimal operational parameters