Scalable Analytics

Providing Actionable Insights for Key Stakeholders at All Levels of Your Organization

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22-01-2019
Abstract

Learn about FactoryTalk® Analytics and ThingWorx tools and how having the right information at the device, system or enterprise level can speed time to insight giving actionable information to the people who need it for critical improvements.
Agenda

CONVERGENCE OF INFORMATION
ROCKWELL AUTOMATION & PTC

CUSTOMER OUTCOMES AND VALUE

TECHNOLOGY AND FUNCTIONALITY

CUSTOMER SUCCESS

MORE INFORMATION
“As IT and OT converge, there is a natural alignment between our companies. Together, we will offer the most comprehensive and flexible IoT offering in the industrial space.”

– BLAKE MORET, CHAIRMAN AND CEO

“Leveraging Rockwell’s industry-leading industrial control and software technology, strong brand, and domain expertise with PTC’s award-winning technology enables industrial enterprises to capitalize on the promise of the industrial IoT and Augmented Reality.”

– JIM HEPPELMANN, PRESIDENT AND CEO
Industrials Investing in IoT

Gartner, IDC FutureScape: Worldwide Manufacturing 2018 Predictions

30% of operations will be fully integrated through IoT technologies by 2019

60% of the 2000 largest manufacturers will rely on digital platforms as the foundation for their industrial ecosystems by 2020

80% of use cases that require human-to-machine interactions will use immersive interfaces like augmented reality by 2030
Early IIoT Investments Are Driving Results

- **ELIMINATED 2,500 HOURS OF MANUAL COLLECTION**
- **46-75% REDUCTION OF BATCH RECORD REVIEW MAN HOURS**
- **MORE THAN 2 MILLION VARIATIONS IN PRODUCTION MANAGED IN REAL TIME**
- **99% UPTIME ACHIEVED AT RETAIL LNG STATIONS WITH CLOUD SOLUTION**
- **20X INCREASE IN ACCESS TO PRODUCTION DATA**
ACCELERATING DIGITAL TRANSFORMATION

Aligning our respective strategies and solutions for “Smart, Connected Operations” & “The Connected Enterprise” to more rapidly deliver value for industrial customers.

Proven Industrial Solutions & Expertise – Unmatched by Anyone

Rapidly Deliver Digital Transformation

Empower Workers through Industry-Leading Technology

Quickly Deliver End-to-End Industrial IoT & Augmented Reality Apps
Our combined capabilities create the most comprehensive, flexible industrial information platform in the market.
Bridging the Digital and Physical

Connect to Physical Assets & IT/OT Systems

Understand the Context

Orchestrate Response

Analyze the Digital Data

Control Assets & Engage People
Just Announced!

InnovationSuite
powered by PTC

Contextualize Data
Orchestrate Processes
Deliver User Experiences
Agenda

1. Convergence of Information Rockwell Automation & PTC
2. Customer Outcomes and Value
3. Technology and Functionality
4. Customer Success
5. More Information
6. More Information
Customer Benefits

- IIoT Visualization and Analytics

- Brings together IT and OT workforces
- Rapidly connects users to information from industrial assets in one or multiple facilities
- Users understand the performance of physical assets and digital systems through one source
- Applications may be rapidly build and deployed for decision makers in various roles
- Complex advanced analytical tasks may be automated, freeing decision makers to drive improvement
- Game-changing augmented reality experiences drive effective workforce instruction, training and service

![Faster Time to Market](image1)
![Lower Total Cost of Ownership](image2)
![Improved Asset Utilization](image3)
![Enterprise Risk Management](image4)
Analytics for the Industrial Internet of Things

Answering the Critical Questions at Every Level of the Operation

**ENTERPRISE**
- **DESCRIPTIVE**: Which facility performed the best?
- **DIAGNOSTIC**: Why is Site A throughput behind plan?
- **PREDICTIVE**: I predict that Site A will be behind plan soon.
- **PRESCRIPTIVE**: What action should I take to avoid Site A from falling behind plan?

**SYSTEM**
- **DESCRIPTIVE**: Is Line 1 running ok?
- **DIAGNOSTIC**: Why is Line 1 quality poor?
- **PREDICTIVE**: I predict that Line 1 quality is moving out of tolerance.
- **PRESCRIPTIVE**: What action should the operator take to avoid poor quality?

**DEVICE**
- **DESCRIPTIVE**: Am I running ok?
- **DIAGNOSTIC**: Why did a fault happen?
- **PREDICTIVE**: I predict a fault will happen soon.
- **PRESCRIPTIVE**: What action should be taken to avoid the fault?
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<th>Operations Management</th>
<th>Production Execution</th>
<th>Maintenance &amp; Service</th>
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FactoryTalk® Analytics

A FULL STACK ANALYTICS PLATFORM

CONNECTED ASSETS

DATA INGRESS

STREAMING DATA

ENTERPRISE DATA

APP MARKETPLACE

ASSET MANAGEMENT & RELIABILITY

OPERATIONAL PRODUCTIVITY

ENTERPRISE RISK

CONNECTED SERVICES

ORCHESTRATED DATA

DATA MASHING

DATA STAGING

OPEN, SECURE

IIoT CONNECTIVITY

Edge

DataFlowML

DataView
Edge

• Data from real-time sources. Find problems faster.
• Stores and forwards data. Nothing important gets lost due to latency.
• Enables closed loop feedback applications. Instant reaction.
• Provides advanced analytics in the “hardware stack”. Easier support.

DataFlowML

• Combines different forms of data for Analytics. No more Excel or SQL.
• Data pipelines are built using leading AI and ML tools.
• Scalable from on-premise server to cloud based infrastructures.
• Handles big data and unstructured data such as text, imagery, audio, etc.

DataView

• Self-service visual analysis tool. Anyone can use it with no pre-configuration of reports or dashboards.
• AI “learns” what you want to see and adjusts accordingly.
• Insightful Storyboards may be saved and shared.
• Runs on any form factor or device.
FactoryTalk Analytics DataView
Self-Service Storyboards and Collaboration Tools
FactoryTalk Analytics DataView
Intelligent Data Mining Tools that Anyone Can Use

Torque Tool Data (XLS)

- Max of Actual (Nm): 13.86
- Max of Target (Nm): 13.56

Intelligent Search
Filter
Drill down
View data
Exclude
Keep only
FactoryTalk Analytics DataFlowML
Visual Programming Interface for Advanced Analytics

Canvas:
- Drag-drop operator
- Connect and Configure operators
FactoryTalk Analytics Edge

Tools for Ingress, Processing, and Egress of IIoT Data

Deploys on a variety of Edge Platforms.
PTC ThingWorx
High-Level Overview

- ThingWorx is a platform, that enables:
  - IIoT Connectivity – live data, transactional and time series
  - Computation – perform calculations on the data
  - Analytics – leveraging the Analytics engine (prediction…)
  - Unified Production Model Development – organize to meet customer needs
  - Visualization – data shared and fused from different data sources in context
  - Configure and Extend – via APIs and configurations

- ThingWorx integrates with:
  - FactoryTalk Analytics – for Advanced Analytics with Industrial Connectivity
  - Vuforia – for Augmented Reality
  - WindChill – to surface data from PLM
Innovation Suite - Better Together

ThingWorx and Vuforia Enhance Rockwell Automation’s IIoT Offering

- **ThingWorx provides…**
  - An integration platform to unify all software applications, from automation to enterprise
  - A common “Pane of Glass” providing simplified user access
  - Provides IIoT capabilities on top of RA & 3rd Party “Things”
    - Drives, Controllers, Sensors, Databases, etc…
  - Enhances RA’s Scalable MES, Analytics and Machine Learning capabilities

- **ThingWorx Industrial Connectivity**
  - Expands the number of Industrial and Enterprise data sources

- **Vuforia**
  - Enables Augmented Reality with traditional RA solutions
  - An alternate way of visualizing our data/visuals
PTC ThingWorx & FactoryTalk Analytics

Simplified User Interface – Single Pane of Glass

- Data presented in context from disparate systems
- No need to switch between different environments
- Visibility extended to assets inside and outside the plant
- Wraps and extends existing user interfaces and technology
  - Embedded HMI Content
  - Analytics and Results
  - Benchmarks across operational assets
  - Workforce Instructions and Work Plans

- Single workforce sign-on
- ThinManager can then distribute ThingWorx and other Visuals (Live Video, non-Integrated Applications, Enterprise Tools, etc.)
Industrial Connectivity Server

IIoT Connectivity Built-In

- Native Connectivity to hundreds of different protocols and device types
- Reduced Cost of Deployment and Support for total system (from 2 systems to 1, from 2 vendors to 1)
- Easier to locate and investigate devices “buried deep” in the architecture for Analytics
- Removes Data Integration, Collection, and “Cleansing” burden from the End-User to enable Analytics. Analytics vendors often require pre-populated databases, formats, and sources.
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Challenge:
- Improve performance and costs of use of the riveting guns
- Improve the throughput of the engine block line

Different Systems, Different Data
One Source of Truth
- Aggregates data from three key manufacturing data sources for Production Managers to access real-time and predictive analytics in context and on mobile devices
- Quality concerns shown based on specific VIN Codes
- React in real time to manufacturing issues and gain insights from aggregated time-synchronized data
- Allows users to look at real time data and as much as 4 weeks in the past
IT / OT convergence and real-time operational Intelligence drive 5 to 8% improvement in productivity.
IIoT WITH ANALYTICS REDUCES DOWNTIME

Predicting alarms 24 hours in advance, with a 91% accuracy.
HIROTEC AMERICA IMPLEMENTS IoT

Enabling Timely Data Driven Decisions – Rapid Time to Value with 6 week IoT sprints.

“X-Factory has been a great opportunity and a wonderful learning experience for HIROTEC, and I thank PTC for inviting us to partner with them,” said Katsu Uno, HIROTEC AMERICA Chairman and CEO.
IIoT and Analytics

- Scalable Each Step of the Way
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Visit “FactoryTalkInnovationSuite.com” for More Information
Thank You!