



**Rockwell**  
**Automation**

# Rockwell Automation

at A GLANCE

**OUR STRATEGY IS TO BRING THE CONNECTED ENTERPRISE TO LIFE.**

We integrate control and information across the enterprise to help industrial companies and their people be more productive.

**\$6.3B**  
FISCAL 2017 SALES

**22,000**  
EMPLOYEES



**80+**  
COUNTRIES



AUTOMATION for a **broad range**  
SOLUTIONS **of industries**

SERVING  
CUSTOMERS FOR  
**114 YRS**



- Innovation
- Domain expertise
- Culture of integrity & corporate responsibility



ABOVE-MARKET GROWTH | PRODUCTIVITY | INTELLECTUAL CAPITAL



**VALUE CREATION**

A man in a dark suit and blue tie is holding a tablet. Overlaid on the tablet and extending into the background is a glowing white cloud with a network of blue dots and lines. The background is a blurred office setting with blue and white light bokeh.

# Smart Manufacturing in the Age of Hyper Connected World!

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# Digitization Enables SMART

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This is the state of most of our Mfg.



Top 10 % of our Mfg. .  
May be classified in this state



To be relevant we need to attain this state sooner the better .

# Macro Trends and Pressures

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## MARKET

Global Competitiveness

Opportunities and challenges in changing global landscape



## WORKFORCE

Talent Shortages & Skills Gap

Global challenge hiring and retaining



## RISKS

Changing Risk Patterns

Highly publicized and expensive incidents worldwide



## TECHNOLOGY

Industrial Internet of Things

IoT value at stake and growth of internet enabled assets

**220,000**

New engineers every year until 2022 to connect the unconnected

*The World Bank Studies*

**70%**

Suffered a security breach in the last year

*Ponemon Institute Survey*

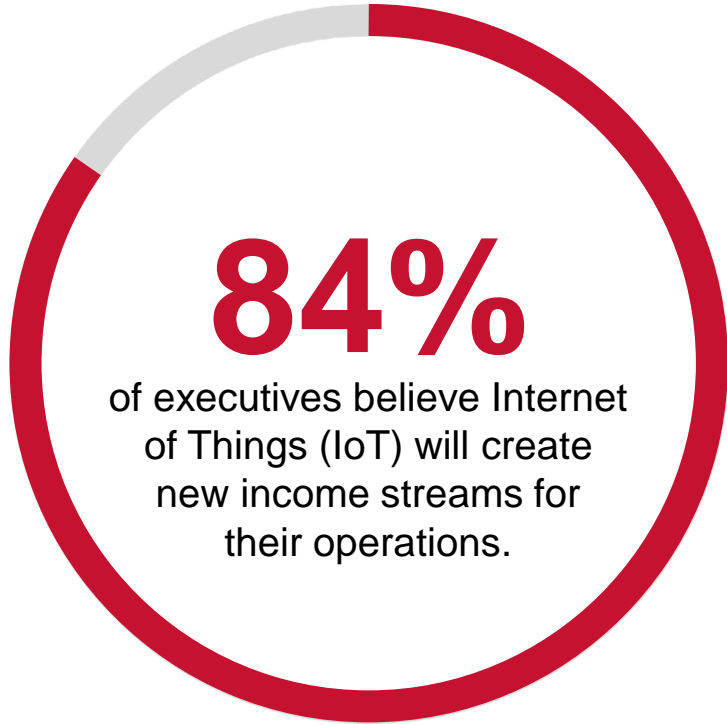
**11%**

Of worlds economy in 2025 will be provided by IoT

*McKinsey & Co*

# Perspectives on IoT

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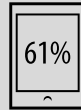


## IoT will deliver:

87% long-term **JOB** growth | 57% long-term **REVENUE** growth



**46%** saw **improving productivity** as the key benefit of IoT.



Executives cited **digital initiatives as a tool for growth**, compared to 31% in 2014.



## Do leaders understand IoT?

38% **fully** | 57% have **some** | 4% have **little** at all



**Only 7%** have developed a comprehensive strategy.

**\$4.6T** Economic Impact of  
Industrial IoT by 2025  
*McKinsey & Co.*

ASSET  
UTILIZATION

EMPLOYEE  
PRODUCTIVITY

SUPPLY CHAIN  
LOGISTICS

CUSTOMER  
EXPERIENCE

INNOVATION

**35%** **Manufacturers** at early adopter  
stages of IoT use case development  
*LNS Research*

# “Measure” and “Analyze” Today ...

- Information is gathered manually or from various plant systems
- Excel spreadsheets are generated and distributed in paper form

## Some issues:

- Gathering data is tedious and time consuming
- Manual data collection is inaccurate
- Data is “stale” at time of reporting
- Reports are not available for timely analysis
- Data is not detailed enough to be actionable

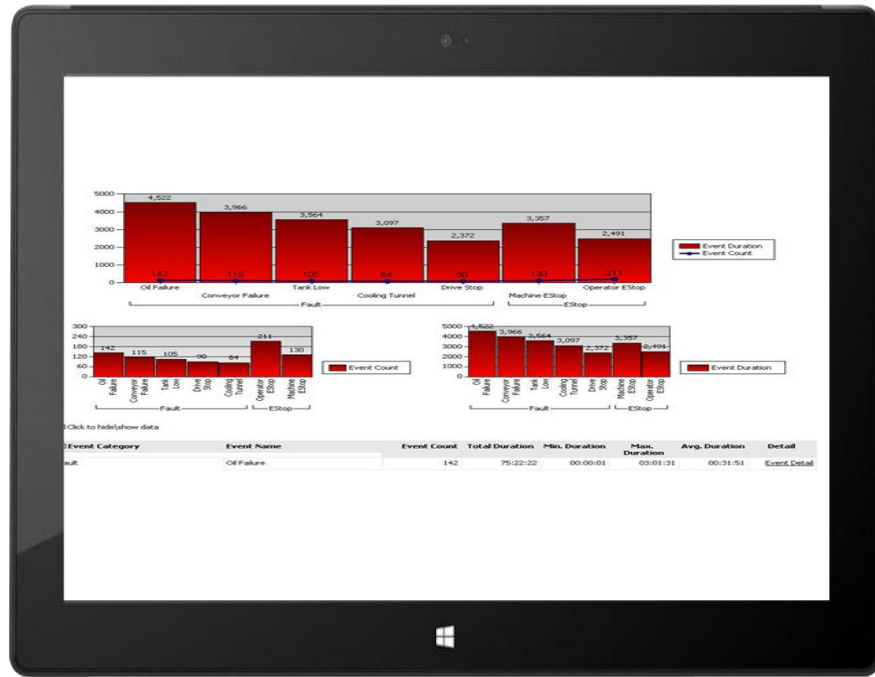
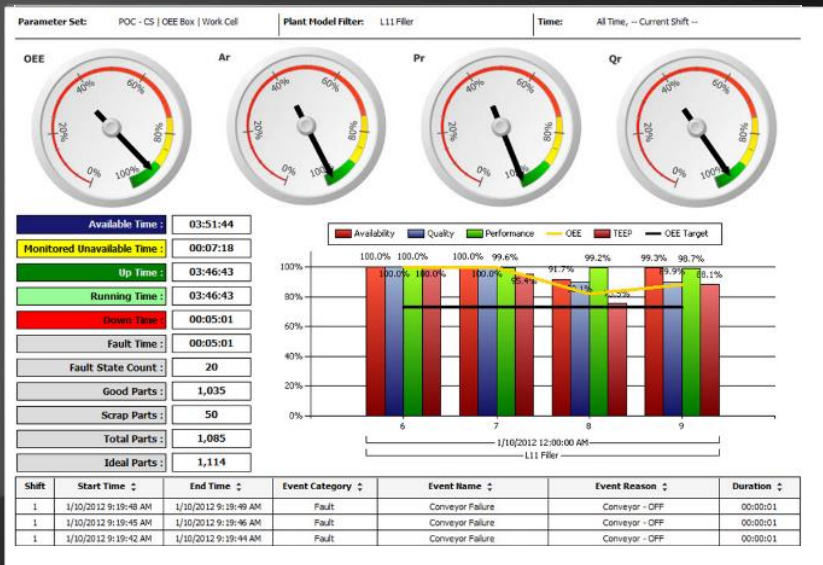


*How is that working for you?*



# A Real Time Digital Solution Would be Better

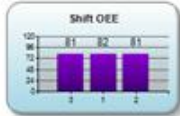
**Rockwell Automation**



Daily Summary | Daily Downtime

Daily Production Summary - 4/15/2014 6:31:32 AM

Report Parameters	
Date:	04/15/2014
Shift:	3,1,2
Shift Start:	4/15/2014 11:00:00 PM
Shift End:	4/12/2014 11:00:00 PM
Shift Status:	NA
Line:	Block Line 1
Cell:	7 De-Burr & Final Testing
Current Product:	NA



	OEE %	Availability %	Performance %	Quality %
Goal	81	90	95	95
Actual	81.37	87.86	97.77	94.89
% Goal	100.62	97.62	102.91	99.88
B/W Goal	0.50	(2.14)	2.77	(0.11)

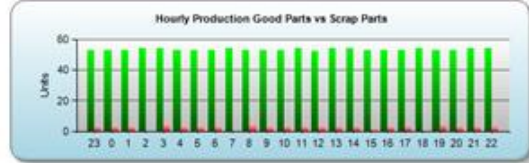


Production Goal	Ideal Forecast	Goal Forecast	RunRate Forecast	B/W Goal
520	524	403	393	(127)

Shift	Availability	Runtime	Downtime	Availability %
3	6:59:55	6:08:42	0:51:13	87.80
1	8:15:14	7:14:26	1:00:47	87.72
2	8:44:49	7:41:59	1:02:49	88.03
<b>Total</b>	<b>23:59:59</b>	<b>21:05:09</b>	<b>2:54:50</b>	<b>87.86</b>

Shift	Part ID	JPH Goal	JPH Actual	Performance %
3	HPV624L	65.45	63.95	97.70
1	HPV624L	65.45	64.22	98.11
2	HPV624L	65.45	63.90	97.63

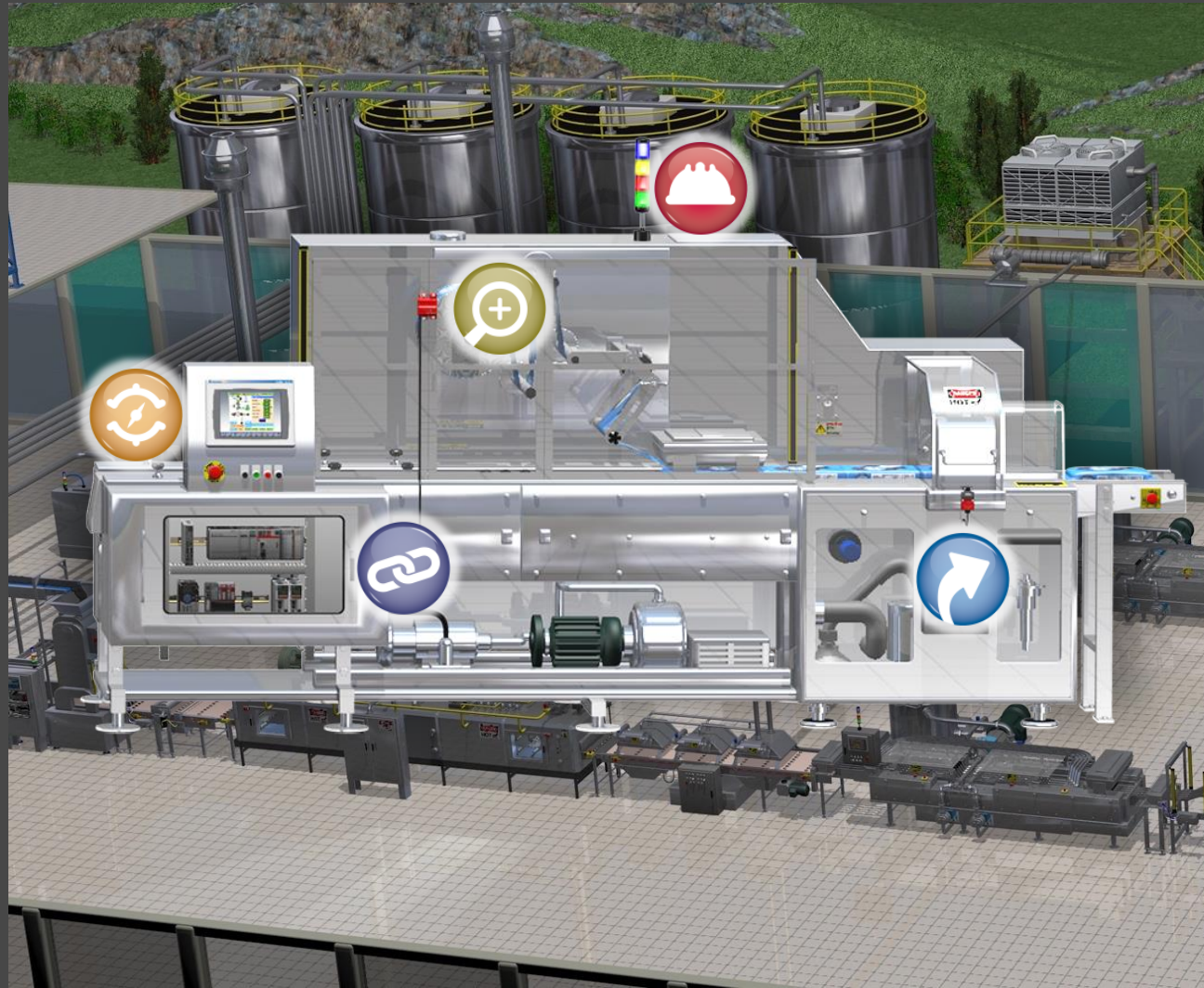
Shift	Part ID	Good Parts	Rework Parts	Total Parts	Quality %
3	HPV624L	373	19	392	94.91
<b>Shift Total</b>		<b>373</b>	<b>19</b>	<b>392</b>	<b>94.91</b>
1	HPV624L	441	23	464	94.84
<b>Shift Total</b>		<b>441</b>	<b>23</b>	<b>464</b>	<b>94.84</b>
2	HPV624L	466	22	488	94.91
<b>Shift Total</b>		<b>466</b>	<b>22</b>	<b>488</b>	<b>94.91</b>



# Workforce



**These generations  
will work differently...**



# Intelligent Asset / Smart Machines

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Integrated Safety

Information Enabled

Simplified Integration

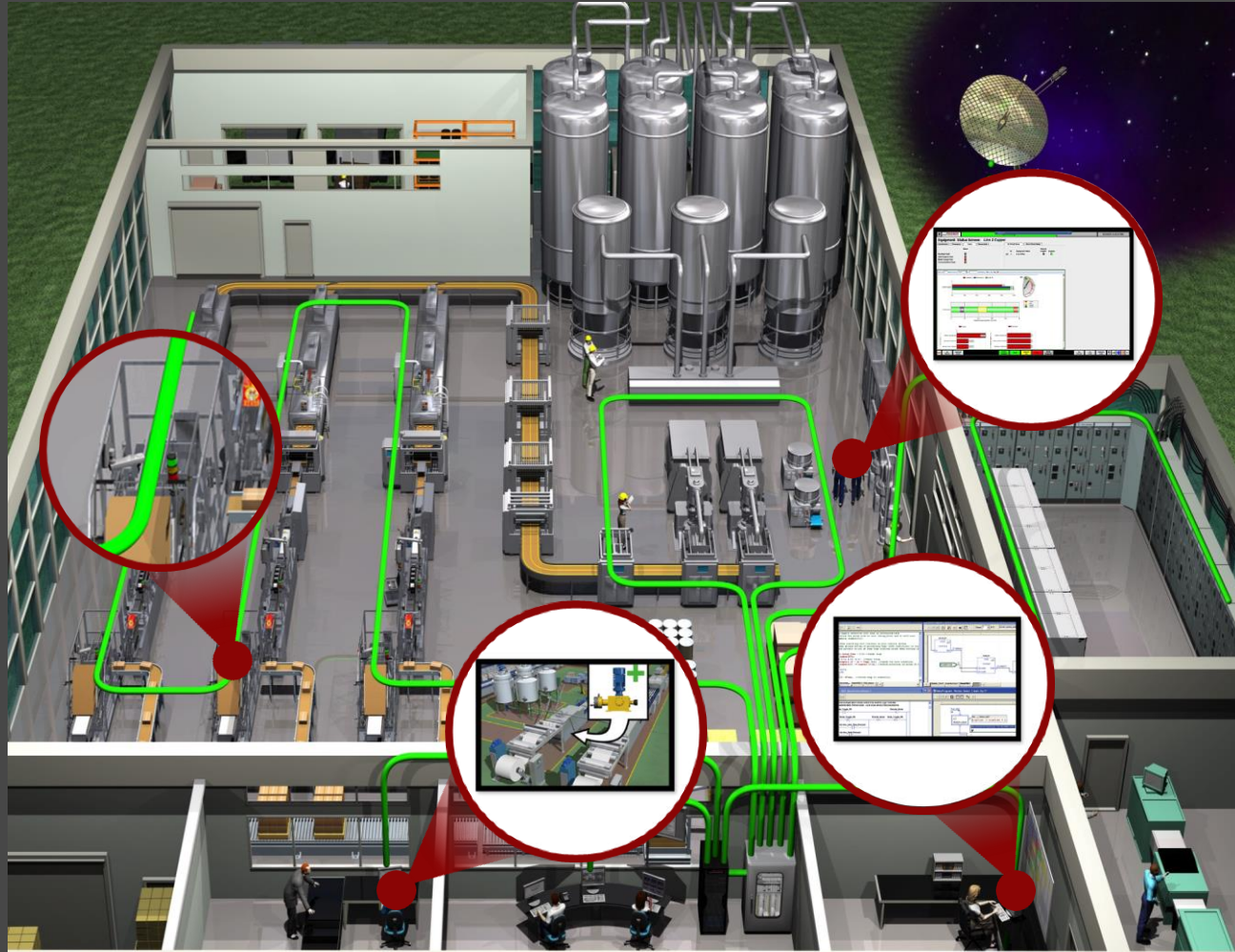
Real Time Diagnostics

Operational Efficiency



## Information Enabled **Solutions:**

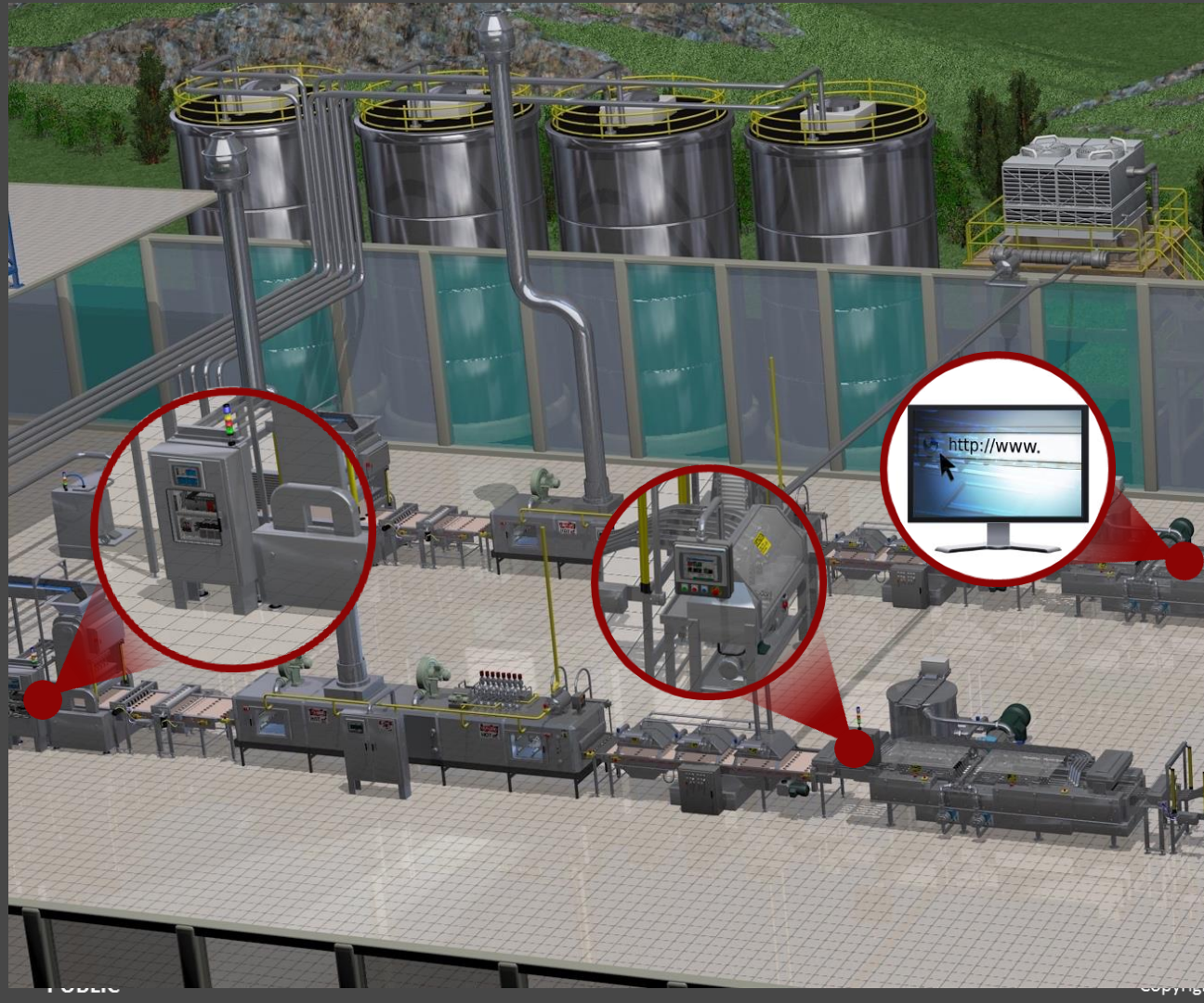
- Embedded Machine Diagnostics from More Intelligent Devices
- Performance Dashboards - Access to Machine Information (OEE) & Advanced Diagnostics
- Networking Infrastructure (shop floor to top floor) & Remote Access for the Machine Builder
- Change Detection Controller Log



## Simplified Integration

### Solutions:

- Single Open EtherNet/IP Network - Standard, Unmodified Ethernet
- Scalable Control Platforms – One Common Design Environment
- Reusable Modular Engineering Code
- RAPID Line Integration - Integrated Line Control & Performance Solution



## Real-Time Diagnostics

### Solutions:

- Embedded Intelligence Devices – Monitor Motor Currents, Vibration/Torque Signatures
- Device Diagnostic Human Machine Interface Faceplates and Validated Add-on-Instructions
- Built-in Web Servers for Device Monitoring

# SMARTER MACHINES & EQUIPMENT

DRIVES  
PRODUCTIVITY

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Event

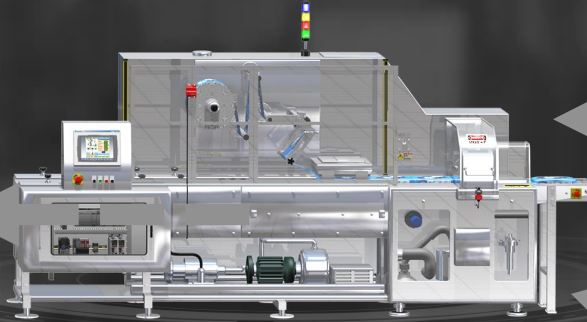
## Real Time Data

Voltage, kWh, Running Time,  
Temperature

## CONTEXTUALIZATION

Energy/Product, OEE

Information



## ANALYTICS

Predict Bearing will Fail  
in 10 Hours

Knowledge

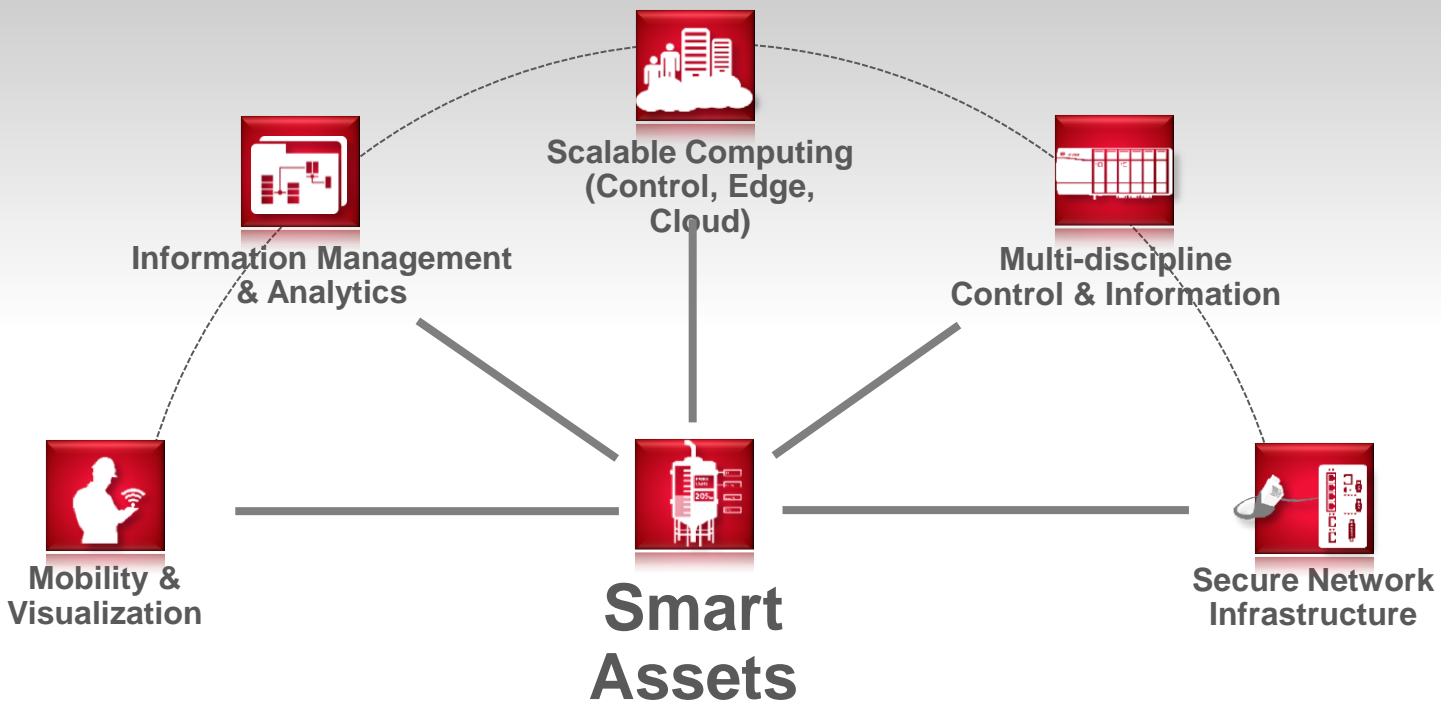
## OPTIMIZE

More Efficient  
Process Workflows

Wisdom



# The Connected Enterprise ...



*... is enabled by Integrated Control and Information*

# IIOT for Enabling Smart Manufacturing

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- Most significant investment by Rockwell Automation in the IIoT space to enhance the vision of The Connected Enterprise
- PTC's Thingworx<sup>®</sup> has been recognized as the most comprehensive IoT platform in the market today (Ref: Gartner, Forrester Research & IDC)

Major Step towards Enhancing the vision of connected Enterprise for Mfg.

# Analytics for Manufacturing

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ENTERPRISE

DESCRIPTIVE

Basic

DIAGNOSTIC

PREDICTIVE

Advanced

PRESCRIPTIVE



Which facility performed the best?



Why is Site A throughput behind plan?

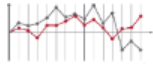


I predict that Site A will be behind plan soon.

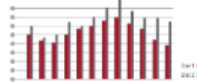


What action should I take to avoid Site A from falling behind plan?

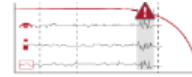
SYSTEM



Is Line 1 running ok?



Why is Line 1 quality poor?

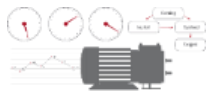


I predict that Line 1 quality is moving out of tolerance.



What action should the operator take to avoid poor quality?

DEVICE



Am I running ok?



Why did a fault happen?



I predict a fault will happen soon.



What action should be taken to avoid the fault?

# Mahindra

Rise.



Work Stations  Master Data Sent  
AUTOMATICALLY  Suppliers

**ERROR PROOFING**  
Zero Defect Delivery

**REDUCED** Mean-time-to-repair  
with Alarms & Real-time Visibility



Inventory Reduction  
on Assembly Floor



**INCREASED FLEXIBILITY**  
With In-Process Changes



LISTEN.  
THINK.  
SOLVE.®

# Thank You



PUBLIC



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