



AIMING FOR AUTONOMY:

ADVANCING YOUR TECHNOLOGY STRATEGY TO TACKLE PRESENT AND FUTURE MANUFACTURING CHALLENGES



TODD GILLIAM

CPG Industry Leader, North America Rockwell Automation



Aiming for Autonomy:

Advancing Your Technology Strategy to Tackle

Present and Future Manufacturing Challenges

Todd Gilliam • NA CPG Industry Leader • 04•24•25

expanding human possibility®







Todd GilliamCPG Industry Leader,
North America





The world's largest company dedicated to Industrial Automation and Digital Transformation



Faster time to market



Operational productivity



Asset management & reliability



Enterprise risk management

Nobody is better positioned to enable true Digital Transformation

PartnerNetwork[™]

Strongest Ecosystem in the Industry!

Global reach with local solutions



TECHNOLOGY PARTNERS

DIGITAL PARTNERS

EPC PARTNERS

DISTRIBUTORS

SYSTEM INTEGRATORS

0 E M PARTNERS



































Rockwell Automation's Evolution

We continue to invest in acquisitions and partnerships to deliver our strategy for the Autonomous Enterprise.

Investments to enhance our Digital capabilities

Doubling our

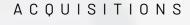
delivery capacity

More than



Co-innovation with industry leading technology companies



















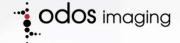
















PARTNERSHIPS















Rockwell Automation















The manufacturing landscape is facing unprecedented change...



- Exploding middle class
- Rich become richer
- Shrinking household size
- Heightened quality and food waste concerns
- Aging population
- Urbanization
- Post Covid-19 behavioral patterns
- Millennials / Gen Z taking over



Patterns in personal consumption

- Increase in convenience
- Focus on health and wellness
- Demand for variety
- Shift towards private labels
- Choice simplification
- Buying local
- Sharing economy
- Focus on shopping experience
- Demand for customization
- Sustainability and Ethical production is becoming more important



- Activist investors
- Direct-to-consumer models
- Vertical integration backwards
- Continued consolidation
- Talent shift/draught
- Compliance with increasingly tight regulations



Evolving geo-political dynamics

- Increasing Inflationary Pressure
- Rising labor and commodity costs
- Economic power shifts
- Broken supply chains
- Increasing governmental intervention
- Economic interconnectedness
- Climate change
- Volatility of raw material costs
- Limited resources
- Russia-Ukraine War



- Mobile world
- Ubiquitous internet
- Big data for operations
- Artificial intelligence
- Miniaturization
- Decreasing sensor costs
- Digital profiles
- Internet of Things
- Virtual reality, wearables
- Autonomous vehicles
- Social media
- Advanced and predictive analytics
- Advanced robotics



Producers are being asked to Do More with Less...



- Improved labor efficiency
- Reduced headcount (automation)



- Improved asset utilization
- Reduced line stoppages



- · Improved production yields
- Reduced material losses



- Improved first-time-right
- Reduced hold times

The top challenges we hear from manufacturers



Workforce and skills shortage

Global manufacturing labor shortage could reach 7.9MM by 2030¹



Operational complexity

67% of manufacturers report a marked increase in SKUs²



Supply chain and market volatility

93% of surveyed senior supply chain executives plan to increase supply chain resilience³



IT/OT technology integration

93% of surveyed executives believe digital is critical to achieving their strategic goals⁴



Environmental pressures

92% of S&P 500 and Russell 1000 companies publish sustainability metrics and reporting⁵







Poll question

Do these challenges resonate with your organization? Are they the right ones? Are there others you would add? How would you rank them?

Go into your Whova app to answer this poll.

Live results.

Rank them in order of priority/difficulty:

- Workforce Challenges
- **Operational Complexity**
- Supply Chain & Market Volatility
- IT/OT Integration
- **Environmental Concerns**



The response: aligning investments and innovation to meet key business objectives



Empower workers



Knowledge capture & management

Workflow optimization

Workforce collaboration & assistance



Optimize production



Production management

Yield optimization

Asset management



Manage risk



Worker safety

Product quality management

Data security



Accelerate business growth via digital transformation



Digital engineering

Predictive / prescriptive optimization

Remote operations



Drive sustainability



W.A.G.E.S optimization

Compliance & reporting

Renewable energy adoption



Overview

Over 1,500 manufacturers around the world contributed to this year's State of Smart Manufacturing Report. The survey reveals optimism as advanced industrial operations technology delivers results that offer hope in the face of evolving economic conditions, labor shortages, skills gaps and cybersecurity concerns.

The 9th annual edition of the State of Manufacturing Report is the largest to date. 1,567 decision-makers from 17 of the top manufacturing countries took part, nearly two-thirds of whom (64%) work for firms with over \$1B in revenue.

Asia North America Pacific 17 COUNTRIES Latin America



TOP INDUSTRIES SURVEYED



HI-Tech, Electronics, Semiconductor

2% 🌤

Auto & Tire, Auto Tier Suppliers, EV, Battery

12%

Mac

Metals, Metal Fabricators, Metal Formers

10%

CPG (Food & Beverage, Home and Personal Care)

View all survey demographics

Smart Manufacturing?

11

Smart Manufacturing is the intelligent, real-time orchestration and optimization of business, physical and digital processes within factories and across the entire value chain. Resources and processes are automated, integrated, monitored, and continuously evaluated based on all available information as close to real time as possible."

This report from Rockwell Automation, in association with Sapio Research, includes a plan for taking action alongside the research findings to help you turn insights into action. Refer to our glossary of Al-related terms used throughout the report.

9TH ANNUAL STATE OF SMART MANUFACTURING REPORT



East and Africa



What are examples of smart manufacturing technology?



Manufacturing Execution Systems (MES)

track and document the transformation of raw materials into finished goods, providing real-time production management to drive enterprise-wide compliance, quality and efficiency.

Production Monitoring provides seamless connectivity to machines on the plant floor, delivering transparent, real-time operational KPIs like Overall Equipment Effectiveness (OEE).

Distributed Control Systems (DCS)

use decentralized elements to control dispersed systems, such as automated industrial processes or large-scale infrastructure systems.

Computerized Maintenance Management Systems (CMMS)

help organizations track and manage maintenance and repair activities for their facilities, equipment and other assets in one place.

Asset Performance Management (APM)

combines process, operational and machine-level data through dashboards to monitor machine and plant health.

Design & Visualization

tools transform raw ideas into intuitive HMIs and immersive VR simulations for smarter, faster production.

Power Control drives continuous flow of valuable process and diagnostic data that informs the design environment, visualization systems and information software.



automates front- and back-office processes across business management and related functions.

> Supply Chain Planning (SCP) combines data from multiple departments to sync demand and supply forecasting to improve inventory accuracy and production management.

Quality Management Systems (QMS)

standardize and automate quality documentation, processes and measurements.

Production Logistics

delivers an orchestrated, agile, zero touch material flow through manufacturing operations with autonomous mobile robots (AMRs).

Analytics use data to solve manufacturing bottlenecks, optimize output and quality and provide new insights, tapping into the power of Industrial AI.

Robotics accelerate autonomous / semi-autonomous operations and contribute to systems that are more intelligent, intuitive and flexible.

Smart Devices are self and system-aware assets that acquire, process and monitor operating data.

Industrial Control Systems

improve processes and production quality at every stage of your operation and provide seamless data exchange.





First stage is determining Digital Plant Maturity level



Poll question

Which level of Digital Maturity would you say your organization (or organizations you support) is currently positioned?

Go into your Whova app to answer this poll.

Live results.

Select one:

- Pre-Digital
- Digital Silos
- Connected Plant
- Predictive Plant
- Adaptive Plant



"Digital Transformation?? Smart Manufacturing??....

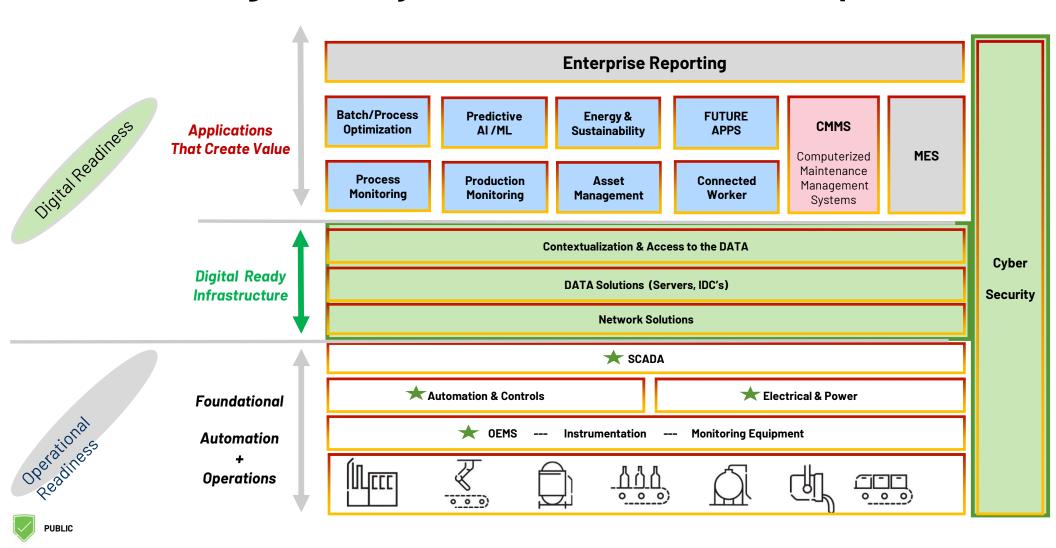


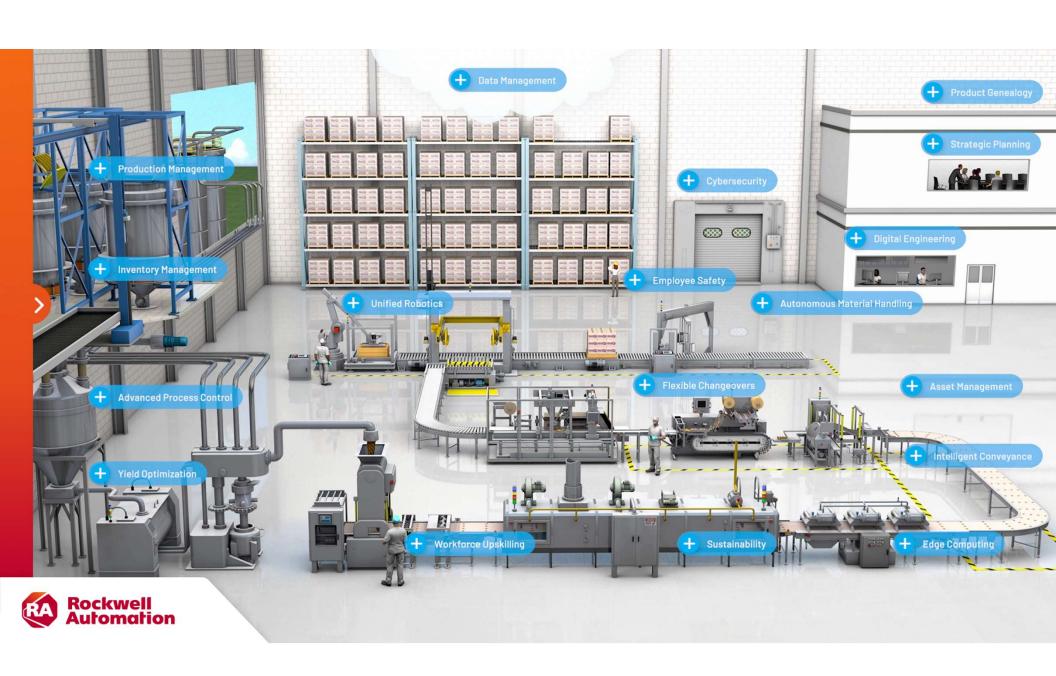
Right now, I've got to meet Production!"





Goal: Build a Digital-Ready Infrastructure that is future-proofed







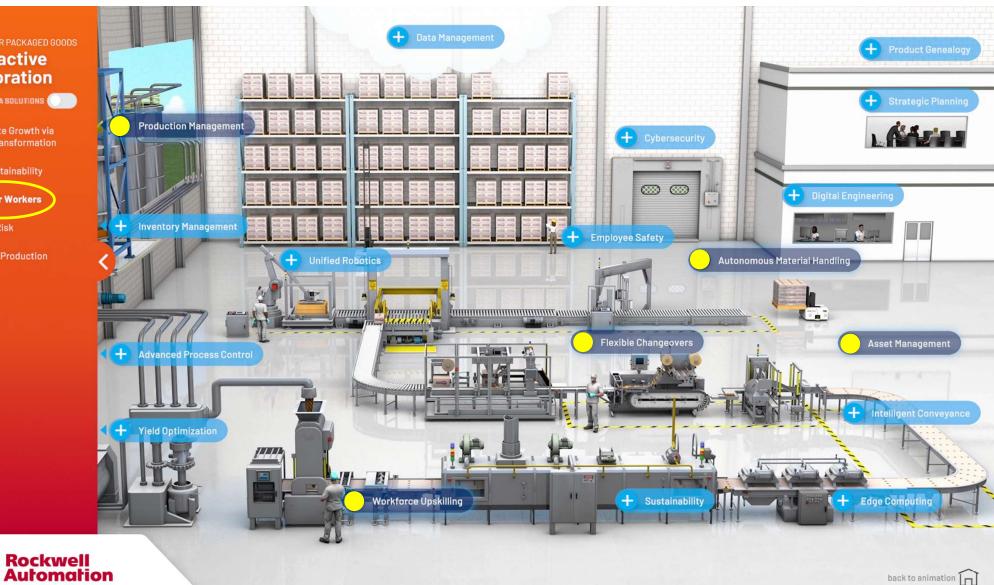
EXPLORE RA SOLUTIONS

Accelerate Growth via Digital Transformation

Drive Sustainability

Empower Workers

Manage Risk





Workforce Upskilling

Knowledge Capture & Training

- Vuforia digitally documents legacy knowledge into graphical training procedures
- · Reduces onboarding time and cost
- Academy of Advanced Manufacturing offers veteran training & placement

Workforce Collaboration & Assistance

- · Enables a connected workforce
- Enables real-time employee and partner collaboration

Optimize Workflows

Maple Leaf Foods

100% digital

step-by-step knowledge capture of critical work instructions

40% improvement in new hire productivity

50% reduction in training costs

25% reduction in scrap and rework costs



OUR PARTNERS

Microsoft







Results Achieved

Plex Connected Worker





Productivity

Connect people to productivity to enhance automation and documentation



Process

Connect people to process to improve coordination and optimize task distribution



People

Connect people to people to encourage an engaged and informed workplace culture with "smart communication"



Purpose

Connect people to purpose to boost retention and inspire employees to do their best work







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Autonomous Material Handling

Material Movement Platform

- Comprehensive platform of autonomous vehicles transforming workflows throughout the manufacturing plant, enabling cost reduction, efficiency, and safety
- Raw material and finished goods transport
- Payload capacity up to 4200lbs
- · Coordinated fleet management software
- Seamlessly integrate with plant floor equipment and business systems

Mauser Packaging Solutions

+600% throughput improvement

Improved safety by reducing manual forklift traffic

Re-allocated labor to higher value-added roles





Results Achieved



Data Management

Industrial DataOps

- FT DataMosaix centralizes data management for highpowered industrial analytics
- Leverages manufacturing-centric data contextualization to derive meaningful OT insights

Fonterra

20% improvement in OEE

Avoided additional capex

Enhanced IT/OT insights, visibility and cloud connectivity



Results Achieved



OUR PARTNERS







Exploration

EXPLORE RA SOLUTIONS

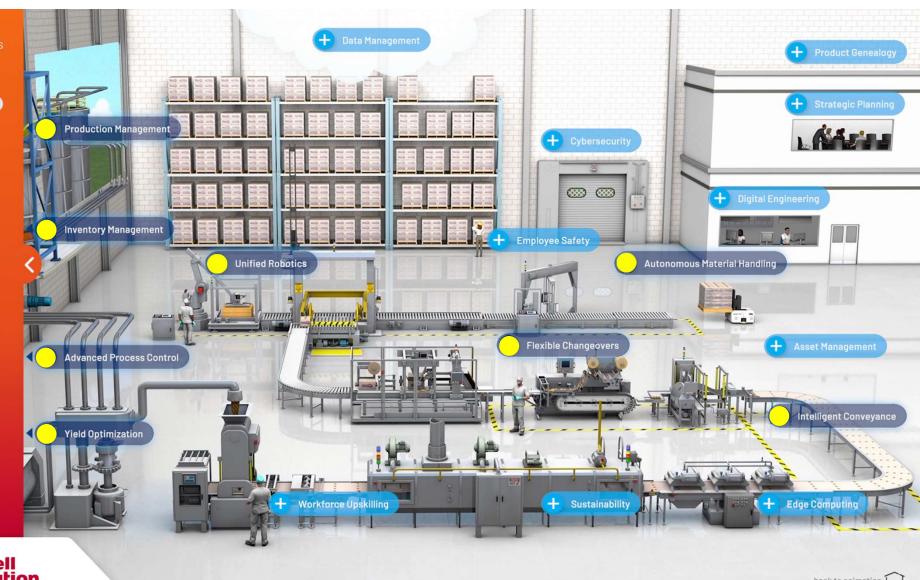
Accelerate Growth via Digital Transformation

Drive Sustainability

Empower Workers

Manage Risk

Optimize Production









Flexible Changeovers

Automatic Format Changeovers

- iTRAK combines linear & rotary motion technology within a machine to increase flexibility
- Quickly transitions between products and packaging formats without manual intervention

Optima

Decreased format changeover time by

50%

100% toolless changeovers

100% elimination of fixed-pitch belt



ITRAK





Results Achieved



Unified Robotics

Integrated Robotics

- Unifies line and robot control for increased productivity
- Simplifies programming, visualization and learning curve
- Agnostic support with a variety of robots (Delta, SCARA, Articulated Arm, Cobots and more)

Aagard

Robot and line control filed within Logix PLC

Improved flexibility for multi-packs



OUR PARTNERS

DENSO



FANUC



Results Achieved



Yield Optimization

Golden Batch

- Batch Performance Analytics is an IoT-based solution to reduce process variability
- Multi-variable, analytically-driven setpoint calculations
- Automated alerts and reporting
- Cross-site comparisons for continous improvement

Predictive Yield Optimization

 FT Analytics Pavilion8 Model Predictive Control leverages linear and non-linear processes to predict future system behavior

Kraft Heinz Ore-Ida Potatoes

10%
increase in
production capacity

Reduced product variability

Leveraged savings to expand modernization



OUR PARTNERS

Endress + Hauser 4



Results Achieved

Optimize Production

Asset Management

Digital Work Order Management

- Fiix cloud-based CMMS digitizes maintenance management to reduce cost, increase employee productivity and asset performance
- · Al-driven insights include:
 - 1) Work Order Insights
 - 2) Parts Forecaster

 - 4) Asset Risk Predictor
- Optimize by integrating to Plex Asset Performance Management or FT AssetCentre

Perth County Ingredients

54% drop in reactive maintenance

47% reduction in after-hours call-ins

\$40,000 decrease in maintenance costs



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Results Achieved



Exploration

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Product Genealogy

Track & Trace / Serialization

- Kezzler provides end-to-end traceability
- · Real-time, cloud-based information accessibility
- Enhances visibility for regulatory compliance
- · Streamlines processes for recall management



FrieslandCampina

100% encryption-based unit-level serialization

24/7 cloud-based accessibility

End-to-end supply chain integration

OUR PARTNERS



Microsoft



Results Achieved





Cybersecurity

Intellectual Property Protection

- End-to-end cybersecurity services from plant and asset
- Ongoing threat detection and rapid response SLAs

Fortune 500 CPG Manufacturer

24/7

continuous protection

48 global manufacturing sites monitored

\$4.24MM saved with data breach avoidance



OUR PARTNERS













Results Achieved



Digital Transformation

Digital Engineering

Virtual Design, Testing & Commissioning

- Emulate3D enables end-to-end system design and throughput analysis through simplified user interface
- FT Echo enables virtual commissioning by validating controller and application code prior to physical install
- FT Design Studio promotes collaboration through cloud-based design

New Product Development

- Windchill PLM streamlines new product development
- Reduces errors and rejections in product specifications

Pearson Packaging

Reduced lead time

Improved customer experience

Optimized workforce



OUR PARTNERS











Results Achieved

Digital Transformation

Strategic Planning

Digital Transformation Professional Services

- Kalypso provides end-to-end Digital Transformation consulting, roadmapping and implementation services
- · Virtualizes production with digital twin simulation
- · Transforms data into insights with data science and Al
- Accelerates time-to-value via decades of experience and best practices

Supply Chain Professional Services

- AVATA provides supply chain management, ERP and enterprise performance management solutions
- . Leading concultant and Oracle cloud coftware 9

\$30B CPG Leader

Defined digital thread and models with

greatest business impact

Built foundational functional/technical architectures, user story backlog, implmentation plan, and governance framework



OUR PARTNERS

Microsoft





Results Achieved

Digital Transformation

Production Management

Production Orchestration

- CPGSuite: Customizable on-prem MES for highly complex processes
- Plex: Configurable cloud-based MES for accelerated deployment and scalability

Production Monitoring

- FT Optix provides cloud-based IoT deployable to any size device
- Easily aggregates data from multiple machines
- ThingWorx provides on-prem IoT and custom app creation

Fonterra

20% improvement in OEE

Avoided additional capex

Enhanced IT/OT insights, visibility and cloud connectivity



OUR PARTNERS

Microsoft^{*}

accenture





Results Achieved



Edge Computing

Localized High-Speed Processing

- Leverage high-speed processing at the source as part of your overall data strategy
- Reduce latency
- · Eliminate intermittent connections
- Reduce the cost of sending data to/from the cloud

Centralized Edge Application Management

- FT Edge Manager enables faster software deployments and scalability for DX initiatives
- Enables OEMs/SIs to centrally manage their fleet of equipment while providing improved support





Results Achieved

(more solutions)

ALINITIATIVES FOR CPG High-Value Use Cases Delivering Quality & Capacity Improvements

Perfect Fill

Minimize giveaway and rework by using Al feedforward to reduce process variability.

Case Study:

Filling operation running at 0.2 seconds per dose realized a 52% reduction in giveaway using soft sensors & feedforward control





Golden Batch

Identify an ideal output and optimize the manufacturing process to replicate conditions that produce it.

Case Study:

Al learned the perfect manufacturing recipe for tortilla production, combining 21 control points, reducing standard error by 73%.



Simulation Optimization

Dynamically adapt the operating plan with Digital Twin scenario analysis to optimize automation systems.

Case Study:

Routing for a fleet of 45 AMRs was optimized to achieve a 13% increase in throughput.



Predictive Maintenance

Preempt asset degradation that causes quality, throughput and availability loss, using advanced condition sensing.

Case Study:

A filling/sealing process avoided 3 asset failures by using high-frequency data from Kinetix servo drives for early detection of asset wear.



Vision Inspection

Automate and improve the accuracy of visual inspections with integrated camera systems.

Case Study:

100% inspection rate
was achieved with an
automated vision
system to detect 4 types
of defects, freeing
human inspectors for
other value-add tasks.





Automation Copilots

Augment human decision-making in automation tasks with Al copilots that provide real-time guidance, analysis, and documentation.

Case Study:

Al copilot reduced troubleshooting time from hours to minutes by automatically analyzing equipment alarms & recommending resolution procedures.







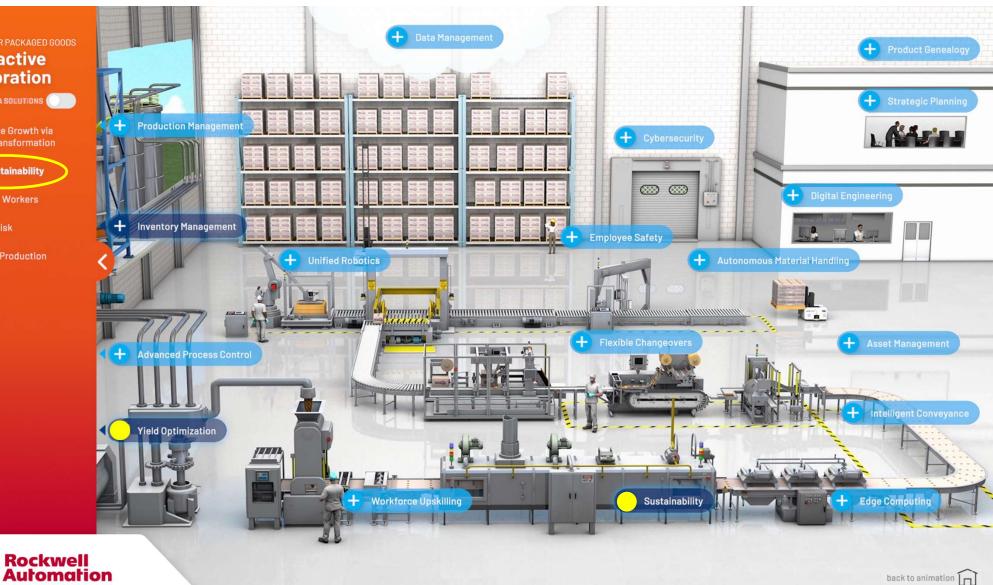
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Sustainability

Energy Optimization

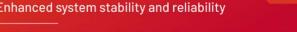
- FT Energy Manager monitors & optimizes WAGES consumption by machine, batch, lot or sku
- Pre-engineered metering solutions & wireless technologies
- Digital solution to meet sustainability & regulatory objectives (ex: scope 1,2,3 reporting)

Leading Home & Personal Care company

Improved energy efficiency by

Enhanced system stability and reliability

Stabilized energy utilization by minimizing unscheduled downtime, and reducing maintenance/engineering costs FT Energy Manager *





Results Achieved



Digital Transformation Evolution













DIGITAL MATURITY

Level 1 Pre-digital plant manual, paper-based processes

Level 2 Digital silos -'islands of automation Level 3 Connected plant -

high level of automation, integration and systems standardization

Level 4 Predictive plant -Integrated plant network

And Beyond

Level 5 Adaptive plant -'plant of the future', autonomous, self-optimizing, plug-and-play

APPROACH

Technology



Industrial **3.0** Revolution





SMART MANUFACTURING

- Smart Devices
- Smart Machines
- Smart Systems

✓Design & Build ✓Operate ✓Maintain

AREAS OF FOCUS

Networks & Safety

Historization

Industrial Automation Optimization

Performance & Quality

Flexible Manufacturing

Cyber Security

Robotics

Smart Machines MES

Digital

Engineering

Asset Management

Industrial 4.0 Revolution

IIOT

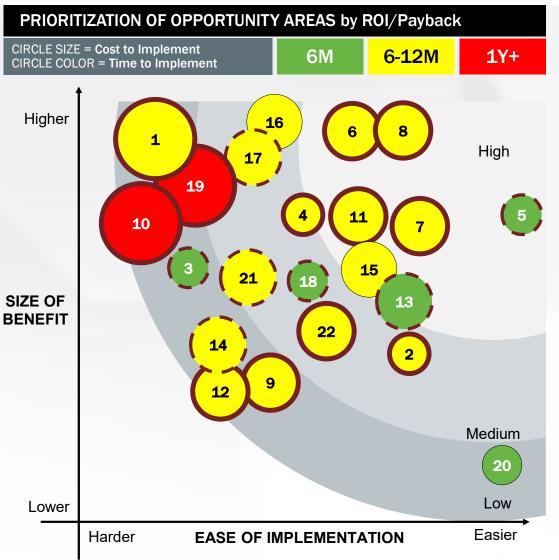
Data Management

Energy Management

Artificial Intelligence

Digital Worker

Digital Twins

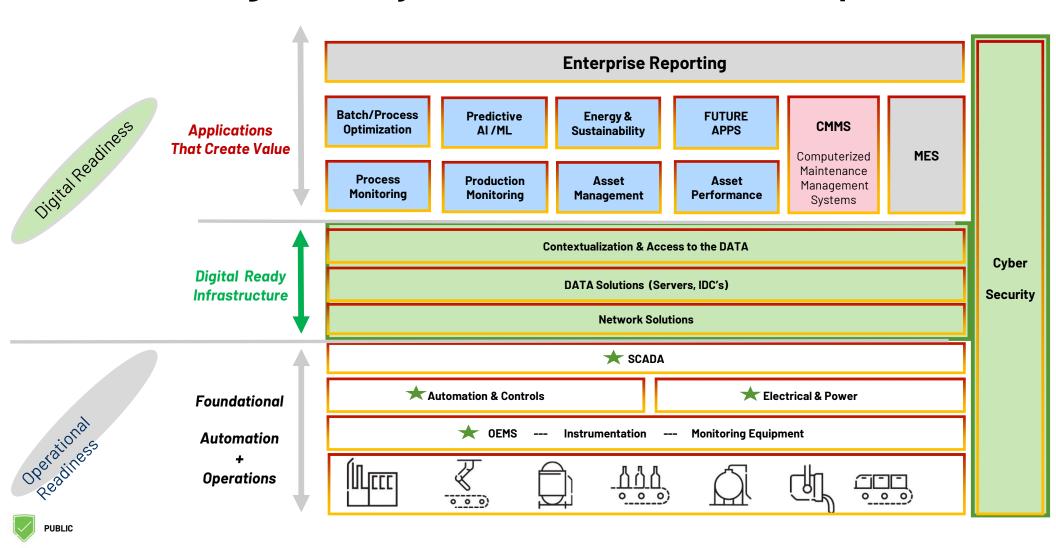


USE CASES

Example Only

- Bill of Materials (BOM) management process redesign (PLM-MDM-ERP-MES)
- 2 Engineering Change Order (ECO) management process
- 3 Product Rationalization using sales and profitability pareto charts
- 4 Artificial Intelligence (AI) to identify opportunities for part and design reuse
- 5 Automated planning & scheduling (Manitowoc)
- 6 Production tracking & order management (MES)
- 7 Production BOM line detail visibility at the assembly line
- 8 Parts serialization: traceability and genealogy (scanning, cameras, etc.)
- 9 Digital work instructions at the assembly line
- Mechanical process automation (assembly)
- 11 Real-time plant performance (Andon, OEE and KPI dashboards)
- 12 Enhanced time & motion study with machine learning (machine vision)
- Real-time SPC / Quality Control monitoring (QC)
- 14 In-line Quality Control automation (e.g. chemical analysis)
- Employee, labor & skills tracking (HRIS), including system simplification
- 16 Materials Management (WMS) for assembly & cookie factory
- 17 Inventory Management (WMS) for Genuine Parts warehouse
- 8 Yard Management & materials transfer
- Material Handling Automation (AGVs in plastics & assembly)
- 20 Fastener Vendor Managed Inventory (VMI) at the line level
- 21 Enterprise Asset Management (Prometheus)
- Asset health monitoring & anomaly detection (e.g. motors, fans)

Goal: Build a Digital-Ready Infrastructure that is future-proofed

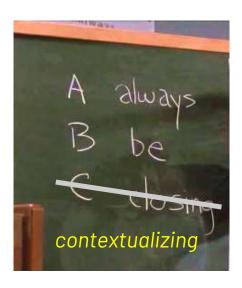


Digital Readiness is an Analog journey











Lessons Learned with Smart Manufacturing Initiatives

4

Bringing a Solution in Search of a Problem

Instead identify business needs across the product lifecycle and design your analytical solutions to address them



Replacing Human Intuition with Machines

Instead develop solutions to *augment* the capabilities of your people by putting transformative new insights in their hands



Treating All Opportunities Equally

Instead partner with the business to prioritize urgent, high-impact, high-value opportunities first



Making Investments with a Multi-year Payback

Instead focus on building a rapid & steady flow of business value, that creates a sustainable, self-funding program



The Factory Must Lead the Initiative

A combination of local leadership driving the operational process and executive leaders supporting scalability



Communicate Progress and Celebrate Successes

Recognize successes early and clearly communicate decisions to highlight value and generate momentum and excitement



Embrace worker/team engagement

Enterprises that design and execute digital roadmaps are more attractive employers and workforce destinations



Get Beyond the Pilot and Scale

Replicate incremental successes and refine across each location for a best-fit solution; work with suppliers with broad reach and leverage SaaS/Cloud for additional flexibility and scalability



Next Steps



Take Advantage of the great breakout sessions & content here at the Smart Solutions Summit



Reach out to your Van Meter account manager or primary contact, if you have follow-up questions



Take the Digital Maturity questionnaire, at this link:



Complete the Survey and/or register any related questions/comments/follow-up requests



Thank You!

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