

**LISTEN.
THINK.
SOLVE.**

AIChE Lecture Dinner Meeting

Migrating towards a Plant-Wide Optimized Production Control System

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March 19, 2013

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Agenda

Introduction to Rockwell Automation

Manufacturing Challenges

Plant-Wide Optimization : PlantPAX

System Migrations to PlantPAX

Global Solutions : Our global project delivery organization

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**LISTEN.
THINK.
SOLVE.**

A Global Presence...



HEADQUARTERS: MILWAUKEE, USA
ANNUAL SALES: \$6.0 BILLION
EMPLOYEES: 21,000
GLOBAL PRESENCE: 80+ COUNTRIES
60 % of sales outside US

Leading global provider of industrial power, control and information solutions



**LISTEN.
THINK.
SOLVE.**

...With a Strong Business in EMEA



HEADQUARTERS: BRUSSELS, BELGIUM
ANNUAL SALES: OVER \$1.3 BILLION
SPECIALIST PARTNERS: 5,600
EMPLOYEES: 4,000
SALES & MARKETING OFFICES: 21

Manufacturing Challenges



Globalization, Sustainability, Productivity, Innovation



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Challenge : Globalization



- Global synchronization of credit markets
 - Access to capital is a level field—globally
- Arbitraging across geographies is less viable
- Global synchronization of supply chains has begun
 - Manufacturing footprints are being “right-sized”
- Speed and innovation critical



**Optimization within the Plant is Consistent
with Overall Enterprise Competitiveness**

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Challenge: Sustainability



- Energy utilization has become top of mind
- Environmental concerns mounting
 - Petro paranoia
 - Water scarcity
 - Cap/Trade
 - Zero Impact Manufacturing
- Alternative Energy Market
- Smart Grid Development
 - Smart Factories



Optimization of Resources is Consistent with Overall Enterprise Efficiency and Productivity

Impact and Opportunity: Corporate Social Responsibility



- The CEO
 - Driving CSR targets to his organization
 - Corporate Social Responsibility
 - Making investor declarations
- Corporate EHS officer targets:
 - Lost time injury
 - Risk management
 - Environmental compliance
 - Carbon footprint
- Operations executives—a lean opportunity
 - Reduce COGS (Cost Of Goods Sold)
 - Re-engineering processes
- Engineering management
 - Product re-formulation



Sustainability Becomes a Key Enabler For Corporate Success

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Response: Sustainable Production



Manufacturers face increasing pressure to reach productivity objectives, utilize resources more efficiently and protect workers and environment



Energy

- WAGES Management
- Utility Optimization
- Intelligent Motor Control
- Consulting and Auditing
- Alternative Cogeneration
- Demand Management

Environment

- Regulatory Compliance
- Emissions Monitoring
- Emissions Optimization
- Cap/Trade Reporting
- Sustainable Production
- Resource Optimization

Safety

- Elect. Safety Components
- Functional Machine Safety
- High Availability and TMR
- Track/Trace/ Genealogy
- Product Integrity
- Market Leadership

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Cleaner, Safer, More Energy Efficient



Energy Management



- Industrial HVAC
- Demand Management
- Load Shedding
- Chiller/Thermal Optimization
- Central Utilities

Resource Optimization



- Material Accountability
- Line Performance/OEE
- Combustion Control
- Production Management
- Digital In-line Blending

Emissions and Environment



- Solvent Recovery
- Waste prevention/recovery
- Water/Wastewater
- Continuous Emissions Control

Product Safety



- Mass Serialization
- Track & Trace
- Regulatory Compliance

Energy Production



- Natural Gas processing and waste management
- Biodiesel and ethanol control
- Wind/solar power control
- Heat Recovery Systems

Machine Safety



- Automated Safety Systems
- Emergency Shut Down Systems
- Hazardous Operations Studies
- Compressor Control
- Burner Management

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Challenge: Innovation

- Aging plants and legacy systems
 - Modernizing infrastructures
- Aging domain expertise
 - Next generation technology operators
 - Educational systems lacking
- Global competition, localized requirements
- Innovation pipelines and partnerships
- Time to market




Innovation Must Address Product, People, Processes

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Impact and Opportunity

- Plant operators will be more technical, less domain knowledgeable
- Process expertise will be built into smarter control systems
- Advanced modeling for optimized performance
- Manufacturing intelligence "built in"

Challenge: Productivity




Corporate		Operations	Engineering
Capital ROA ROIC		Asset Utilization Inventory Velocity	Design for scale and maintainability
Improve quality		Quality	Continuous process improvements, change management
Reduce costs		Automation investments	Serve automation KPIs to management
Improve cash flow		Variable costs (material/ energy)	Design for efficiency, yield
Globalize Footprint		Supply chain efficiency	Best in Class vendor selection
Demand Based Mfg		Improve decision support	Standards – information, automation
Reduce Carbon Footprint		Minimize scrap/ rework	Managing asset lifecycle
Time to market		Demand response (on time delivery)	Engineering efficiency

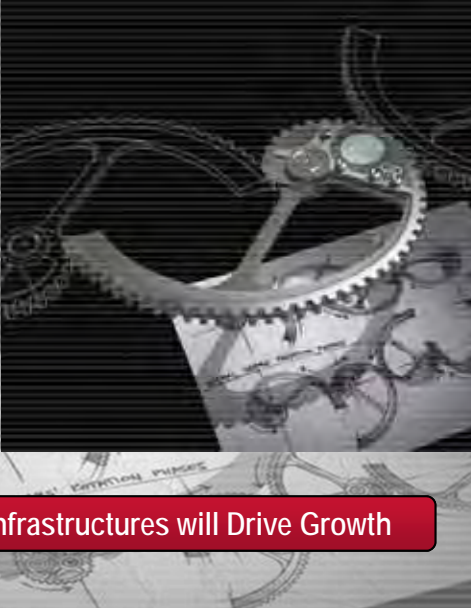
Cascading Productivity is a key driver of Operational Excellence

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Impact and Opportunity



- Legacy systems retarding growth
- Productivity drives investment
- Aging automation equipment
- Advanced controls and information open productivity gains
- Information exchange standards emerge to promote efficiencies



Modernization of Automation Infrastructures will Drive Growth

Response: Plant-Wide Optimization



New pressures are driving manufacturers across their enterprise on **continuous improvement** at all stages of the plant lifecycle.

Manufacturers today must **leverage** their **automation investment** to create an architecture for continuous optimization.



Maximize Return on Assets

- Risk Mitigation
- Time To Market
- Supply Chain Efficiency
- Globalizing Footprint
- Demand Forecasting

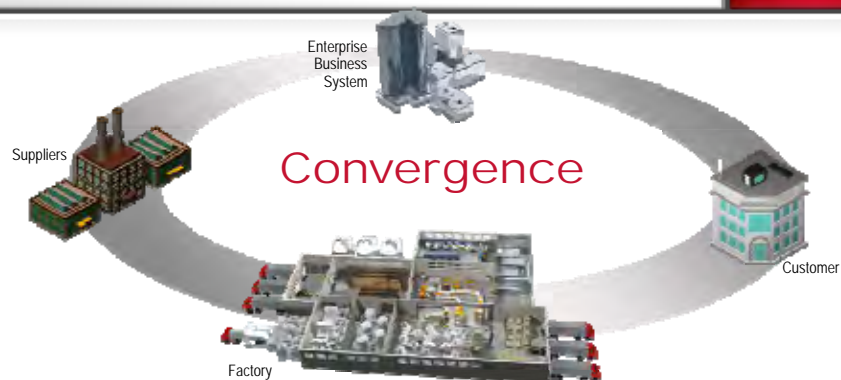
Flexible Operations

- Asset Efficiency
- Cost Management
- Production Intelligence
- Utilization
- Quality, Yield, Productivity

Innovative engineering

- Decision Support
- Advanced Process Control
- Design Productivity
- Total Lifecycle cost
- Global/ Local Standards

Enabling Plant-Wide Optimization

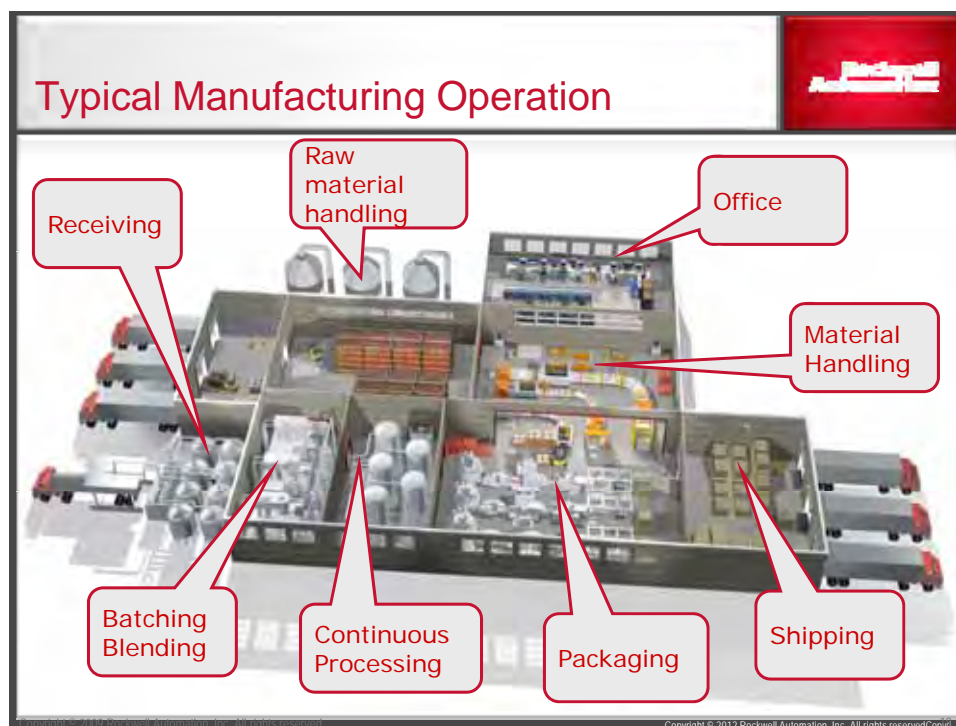
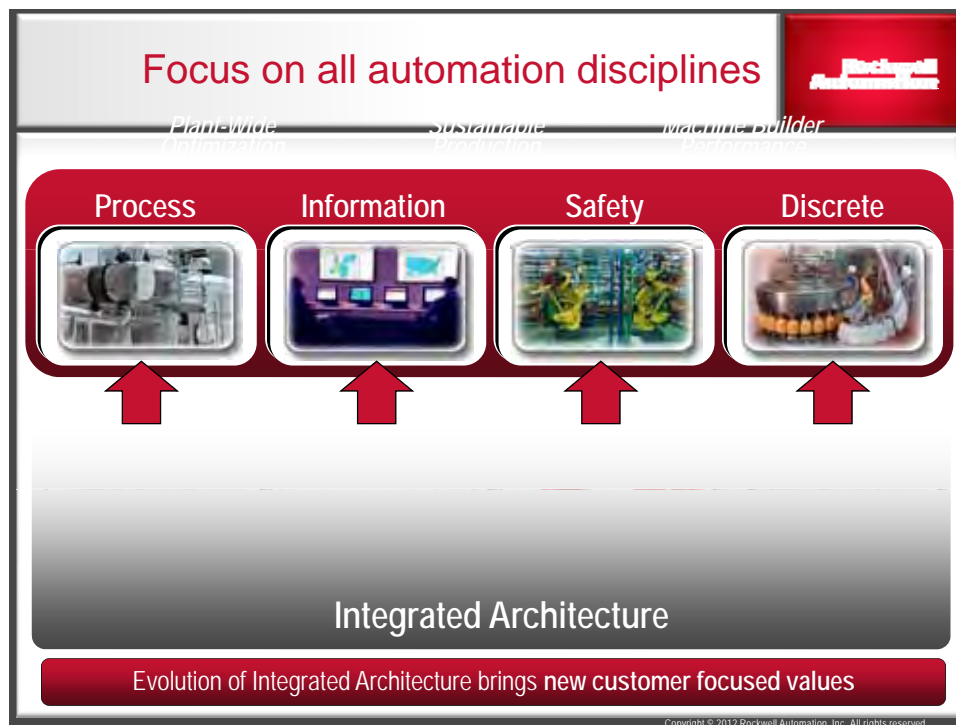


Technology to
Converge the Plant

- Unprecedented levels of visibility
- Flexibility to change quickly with the market
- Simplification of functionality and systems

Automation is a hidden value amplifier. Unlock profit potential with real-time decision power.

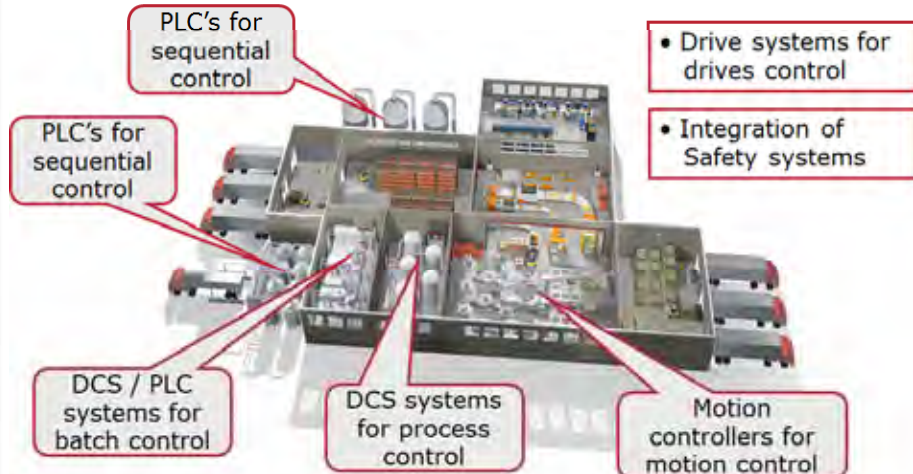
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Challenge : Different control systems



Traditionally, different control platforms or systems have been used for different control applications in your plant:



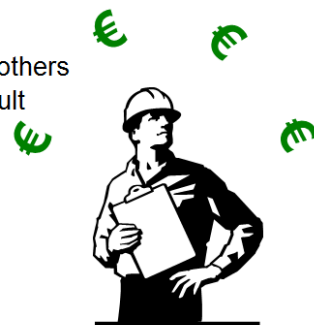
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Separate automation control systems require worrying about...



- Multiple vendor control environments
 - Different engineering tools and databases
 - Control Networks & Information networks are using different technologie
- Managing multiple sources for spare parts
 - Increased spare parts inventory
- Training on each different system
 - Managing multiple skill sets
- Making each system communicate with the others
 - Inter "System" communications is difficult


...and cause an increase in complexity and **cost** to Design, Operate and Maintain your plant, mill, or manufacturing facility



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State of Manufacturing Evolution
Process and discrete automation are converging

Logix PAC (Programmable Automation Controller) is offering a single platform addressing all control disciplines :



- Drives control with **PAC**
- Integration of Safety systems in **PAC**

Automation Controller for sequential control

Automation Controller for batch control

Automation Controller for process control

Automation Controller for motion control

Object oriented & Information enabled Infrastructure for Real Time Control & Information access

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Integrating Information, Control, Power and Safety... For Optimized Operations

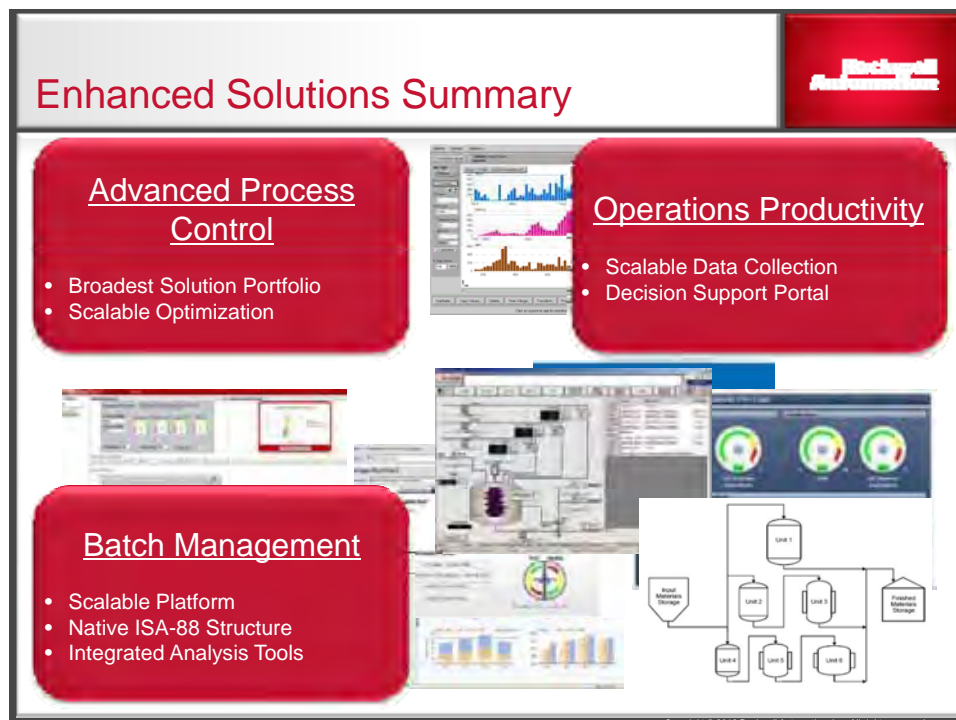
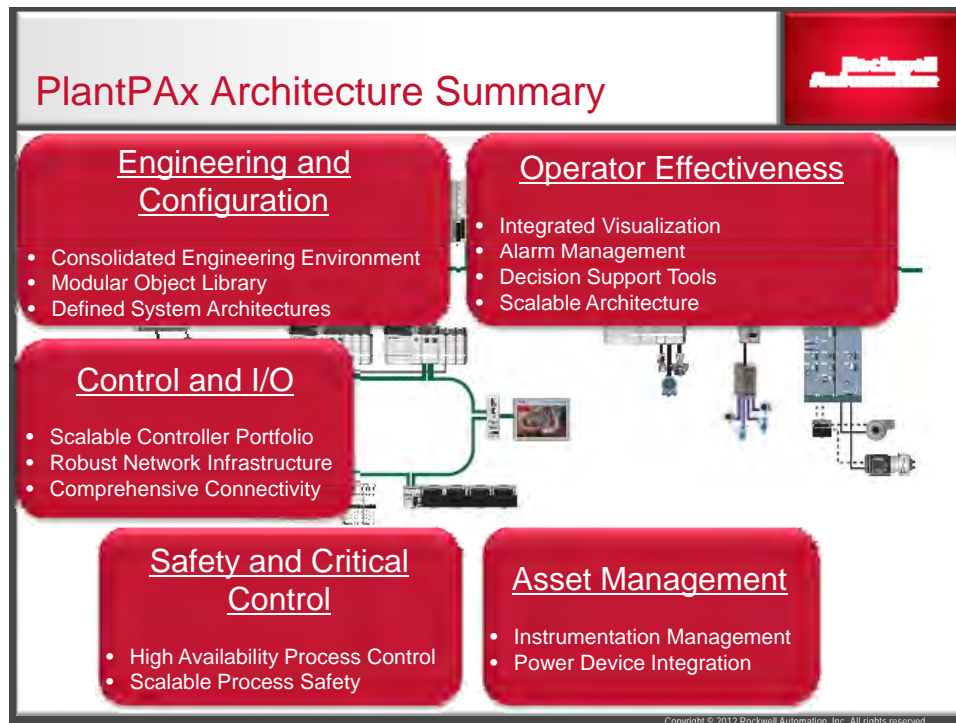


PlantPAx
Process Automation System

- Condition Monitoring & Protection
- Distributed Process Control
- Intelligent Motor Control
- Safety & Critical Control
- Asset Management
- Model-based Predictive Control
- Integrated Information Systems
- Compressor & Turbine Machinery Control

- Visibility of Plant Operations
- Monitoring and diagnosis of asset health
- Asset utilization and environmental protection
- Production flexibility and regulatory compliance
- Energy usage and production optimization

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Skid and Process Equipment Solutions



Partnerships with Process Skid Builders

...Drive consistency in automation designs despite the shift towards modular-design plants

Reduce Integration Cost and Risk

...Ensure OEM automation scope is easily integrated into PlantPAx according to best practices and proven methodologies

Overall System Performance

...Proven, tested architectures for not only DCS applications, but skid-sized solutions as well to ensure total system performance, no excuses



Engaging skid builders to help end-users respond to changing business demands

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Process Controller

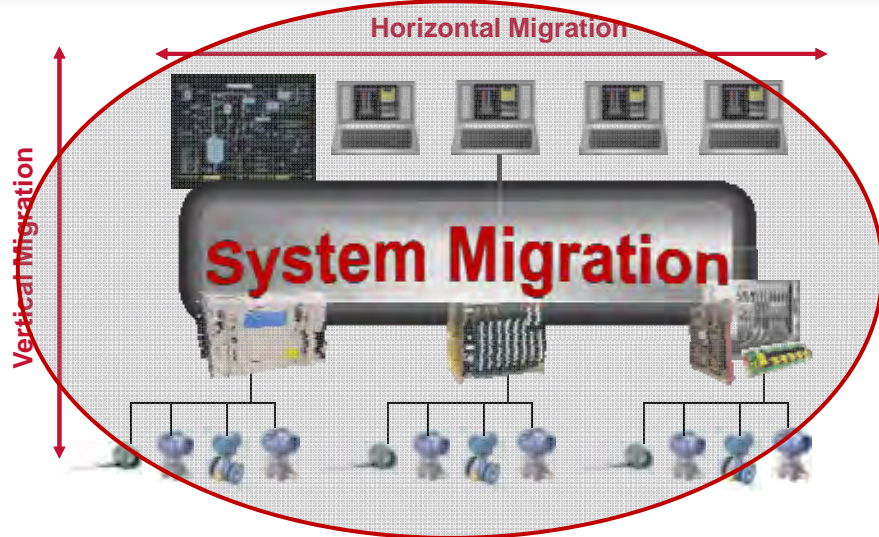


- ARC: Programmable Automation Controllers (PACs) are multi-disciplined controllers capable of providing real-time logic, motion, and process control, in addition to HMI and other functions, on a single platform



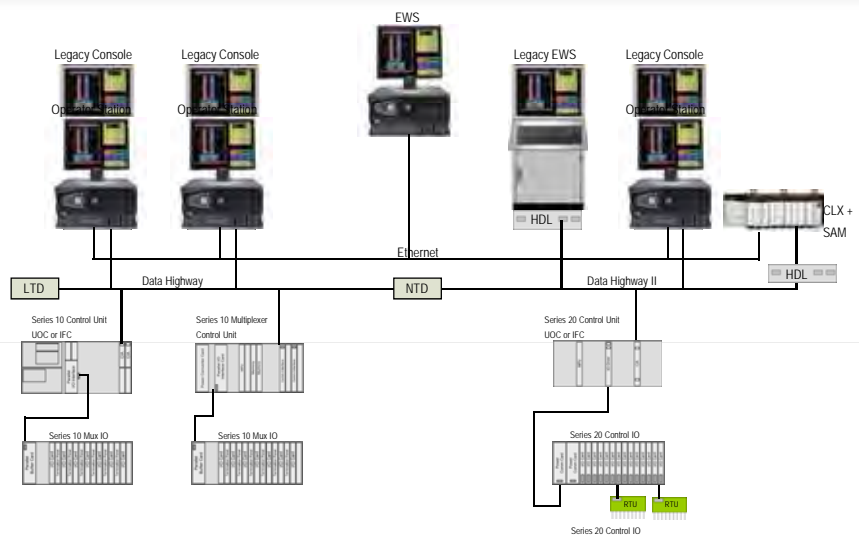
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3 Types of Migration



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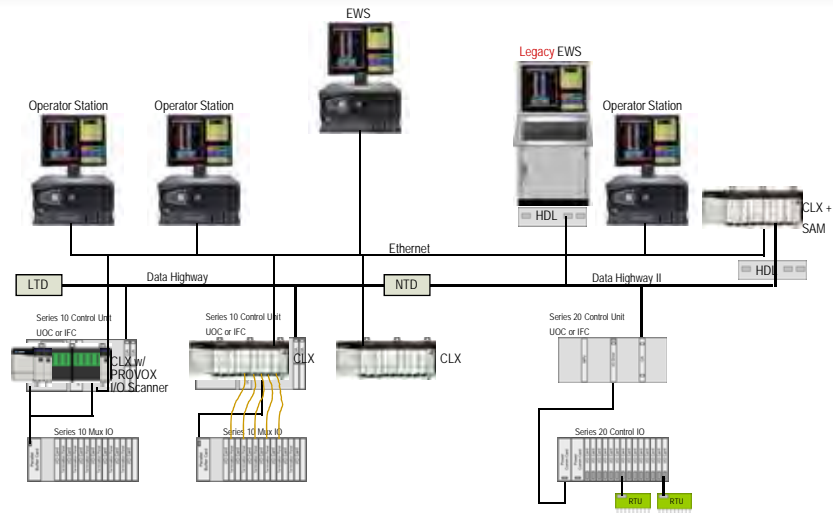
Phased Migration - Phase 1



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Phased Migration - Phase 2

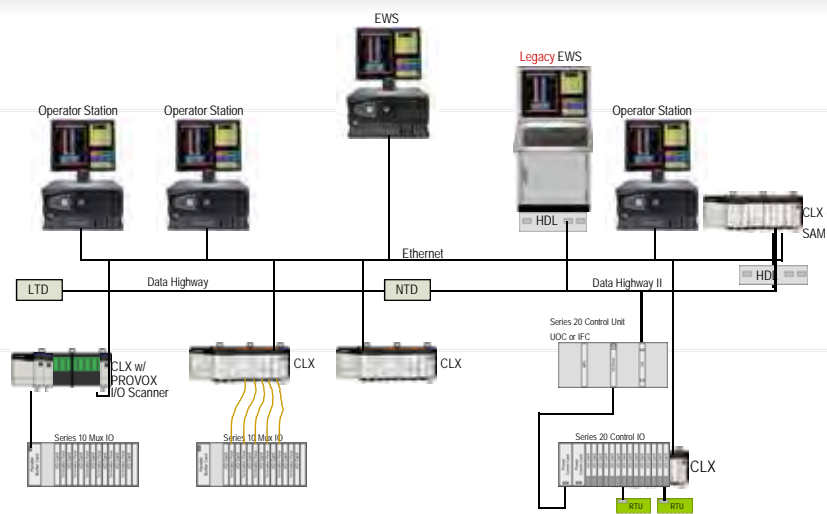
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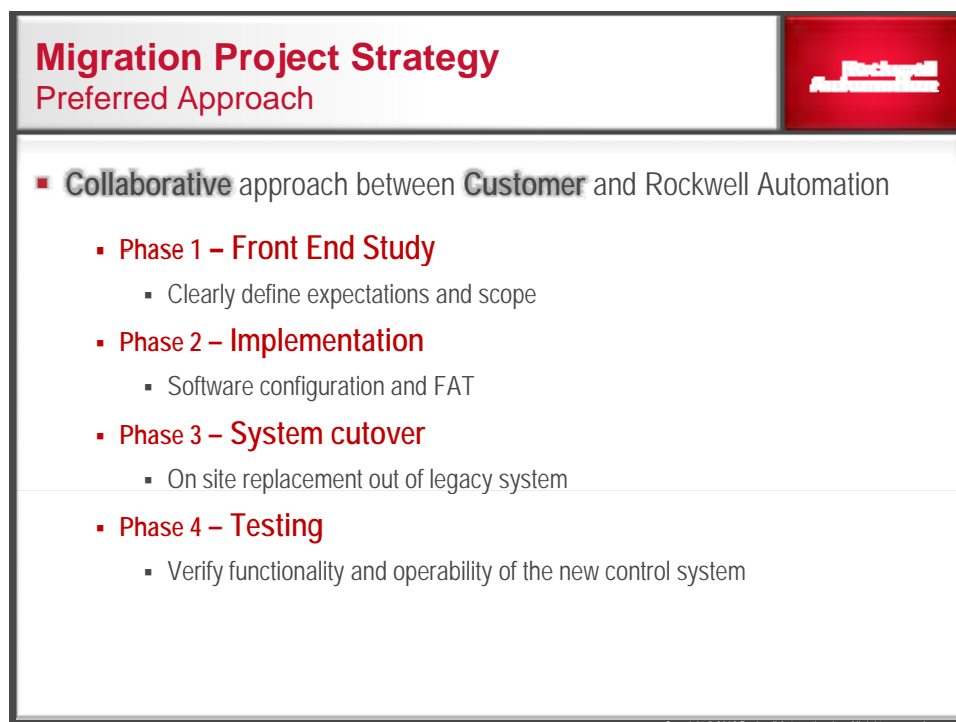
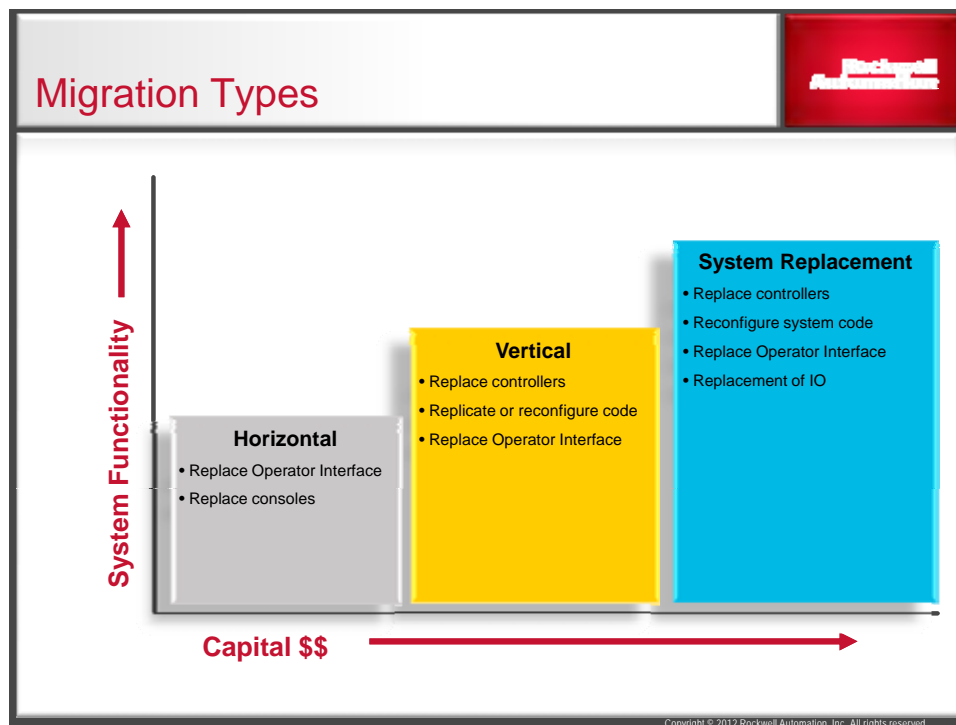
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Phased Migration - Phase 3

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Global Solutions

Bringing you a world of experience




Global Execution

- ✓ **Consistent** methodology deployed in all locations
- ✓ The right team for your project from our worldwide talent

Domain Expertise

- ✓ All major industries
- ✓ Any production environment
- ✓ Combining technology & **application knowledge**

Project Management

- ✓ Based on **PMI® PMBOK®**
- ✓ Certified project managers
- ✓ Repeatable, measurable, auditable
- ✓ **Risk management**

Helping you exceed your business goals

Information | Process | Discrete Automation | Power & Motion | Sustainable Production | Technology Migration | Hardware Integration

80 Countries | 20 Languages | 2500+ employees | Average 13+ Years Experience | Single point of contact

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Global Reach




Americas
 • 1,000+ employees
 • 20+ Countries

Europe, Middle East & Africa
 • 1100+ employees
 • 50+ Countries

Asia Pacific
 • 500+ employees
 • 13 Countries

Rockwell Automation: 21,000+ employees in over 80 Countries
Global Solutions: 2,600+ employees in over 80 Countries

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Domain Expertise



- Experienced industry professionals
 - **13+ Average** years of experience
 - Acquisition of industry leading companies
- Applying expertise to your unique challenges
 - **Best practices** based on previous projects delivered
 - Continuous improvement from lessons learned
 - Partnering with **industry experts** to complement our skills
- Applying solution experience from other industries
 - Apply best in class approaches from other industries



Combining the right balance of technology, industry and cross-industry expertise to deliver solutions unique to your challenges

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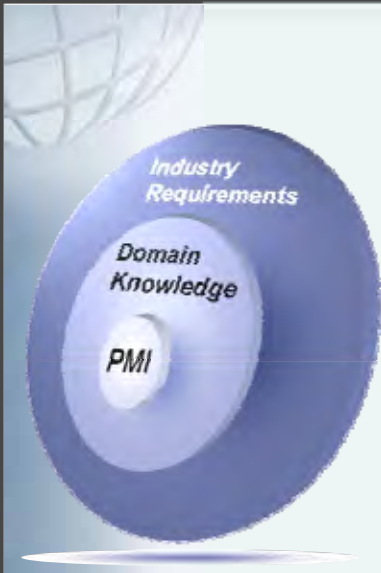
Repeatable Industry Solutions



Food & Beverage <ul style="list-style-type: none"> Product safety and compliance Line Performance Batch, Blending, Routing & CIP Production & Order Management 	Oil & Gas <ul style="list-style-type: none"> Integrated Control & Safety Systems Production & Pipeline SCADA Rotating Equipment Control Engineer, Procure & Construct
Household & Personal Care <ul style="list-style-type: none"> Material Tracking/Lineage Historian & Dashboards Mixing, Blending, Routing & CIP Production & Order Management 	Metals <ul style="list-style-type: none"> Melt Shop & Continuous Casting Strip Processing & Finishing Rod & Bar Mills Material Tracking
Life Sciences <ul style="list-style-type: none"> Full MES & Compliance Formulation & Filling Track & Trace Modular Build 	Pulp & Paper <ul style="list-style-type: none"> Burner Management & Digesters Stock Prep / On-Machine DCS Paper & Tissue Machine Systems Winder & Sheeter Safety
Automotive <ul style="list-style-type: none"> Body & Painting Line Control Error Proofing & Kitting Presses & Press Line Control Scheduling & ERP Integration 	Mining, Minerals & Cement <ul style="list-style-type: none"> Ventilation on Demand Ore Beneficiation/Processing Loadout Systems Crushers & Conveyors
Tire & Rubber <ul style="list-style-type: none"> Safety Wind-up & Let-off (WULO) Calenders Mixing/TSR Systems & Curing Extruders 	Power Generation/Energy Management <ul style="list-style-type: none"> Demand Response Load Shedding & Demand Side Management Renewable Power Integration to Renewal DFIG
Chemicals <ul style="list-style-type: none"> Batch Processing Mixing & Blending Material Tracking Tank Farm Control 	Water & Wastewater <ul style="list-style-type: none"> Process Control Power Control SCADA - Data Collection Remote Terminal Units

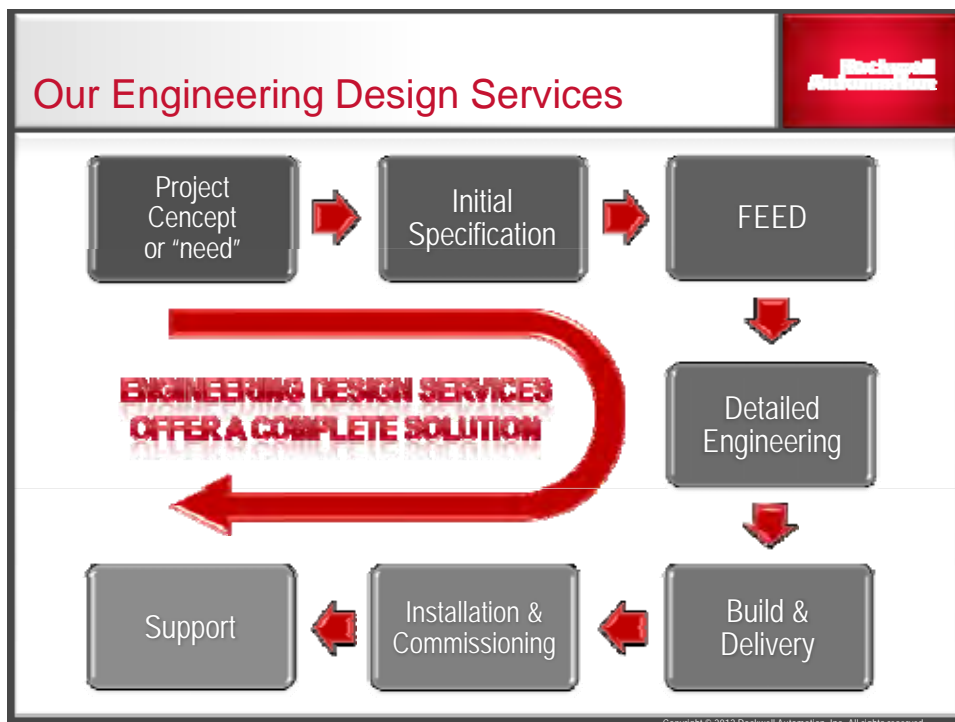
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Project Management






- Certified project managers
 - **Project Management Institute (PMI)** knowledge base combined with our domain expertise
- Project Methodology
 - Comprehensive processes
 - Project Management **methodology**
 - Delivery methodology
 - Includes tools and standards
 - Standard project templates
 - Business systems
 - Specific project management functions
 - **Mitigate risks**
 - On-time and on budget
 - Promotes **consistency / quality**

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Partner Ecosystem



PartnerNetwork™

Business Enterprise	Sales & Solutions	Products & Technologies
<ul style="list-style-type: none"> Strategic Alliances Enterprise Solution Partners 	<ul style="list-style-type: none"> Distributors Solution Providers Machine Builders 	<ul style="list-style-type: none"> Product Refineries Technology Licensing

Rockwell Automation

Business Enterprise Partners
 ...Strategic Alliances with companies like Cisco Systems, Endress+Hauser, and Microsoft


Sales and Solutions Partners
 ...Approximately 320 Distributors and over 100 Solution Providers worldwide for local support

Product and Technology Partners
 ...Over 1000 products from over 100 companies worldwide help to extend our technology into adjacent areas

A large global ecosystem for solutions and support of your Rockwell Automation installed base


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Complete Lifecycle Support



Services & Support

- Define Business Problems
- Maximize Operations Investments
- Everyday Needs



Global Solutions

- Global Execution
- Domain Expertise
- Project Management

Solutions & Services for the entire automation lifecycle
 LISTEN THINK SOLVE

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Services & Support

Global Support. Local Address. Peace of Mind.




Maximize Productivity

- ✓ Increase Mean Time Between Failures
- ✓ Decrease Mean Time To Repair
- ✓ Improve maintenance knowledge
- ✓ Optimize systems performance
- ✓ Improve equipment reliability

Optimize Plant Assets

- ✓ Extend asset life
- ✓ Improve inventory integrity
- ✓ Improve inventory accuracy
- ✓ Improve component standardization
- ✓ Reduce assets

Improve Financial Performance

- ✓ Reduce maintenance expenses
- ✓ Avoid downtime costs
- ✓ Reduce operational costs
- ✓ Increase Return on Net Assets
- ✓ Increase Working Capital

Protect Your Investment

Online & Phone Support | Training | OnSite Support | Repair Services | MRO Asset Management | Safety | Network & Security | Managed Services

80 Countries | 20 Languages | 6 Remote Support Centers | 10 Remanufacturing Depots | 9 Exchange Hubs | Average 13+ Years Experience

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What services do we provide our customers?




Online & Phone Support

- System-level support
- Unlimited, real-time support
- Unlimited, online resources and tools
- Live chat and support forums


Repair Services

- Product remanufacturing
- Third-party repair
- Annual repair agreements


OnSite Services

- Embedded engineering
- Preventive maintenance
- Migrations and conversions
- Start-up and commissioning


Training Services

- Instructor-led and computer or web-based courses
- Virtual classroom
- Training assessments
- Workstations and Job aids


MRO Asset Management

- Warranty tracking
- Consolidated asset reports
- Quick access to global spare parts inventory
- Owned & managed spare parts inventory


Energy Services

- Energy monitoring and analysis services
- General and comprehensive energy audits


Network & Security Services

- Control system lifecycle services
- Manage network convergence
- Security technology, policies and procedure services


Safety Services

- Safety assessments and remediation
- Safety design, integration and validation services

A global infrastructure and subject matter experts to protect your automation investment

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Differentiation: Technology



Information Enabled

... Designed from the beginning to play a vital role in the operation of your business. IT friendly technologies ensure key production data gets to the right people at the right time.

Scalable Solutions

... A system that can scale from 50 I/O to 50,000 I/O, which means your OEMs can use the same technology on their skids as you use for your plant-wide DCS.



Multi-Disciplined Control with a Single Platform

... Process control coexists with discrete, safety, power, and motion control in the same system – no gateways, bridges, interfaces, multiplexors, or translators.

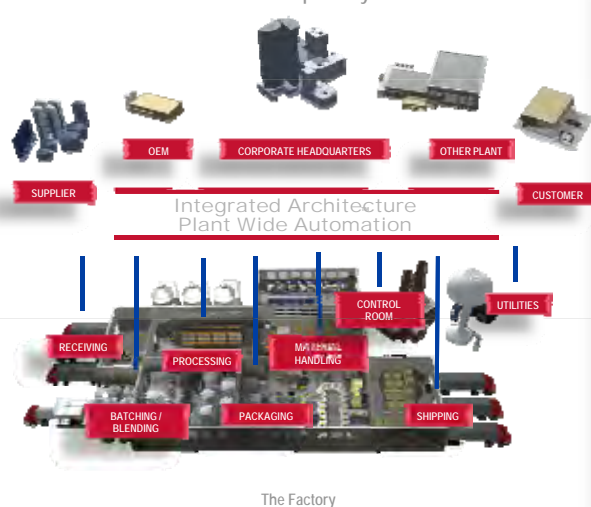
Innovative technology designed with today's business challenges in mind

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One Architecture for Plant Wide Control & Information




Business Enterprise Systems




- Improves productivity & reduces costs
- Integrates control, networking, visualization & information technologies
- Addresses full range of control & information needs
- Extends performance gains across your enterprise
- Provides unparalleled functionality, flexibility & scalability

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Differentiation: Customer Focus






Listen. Think. Solve.
... Our commitment to understanding your needs, applying the best automation expertise, and solving your problems




Sustainability, Productivity, Globalization, Innovation
...Solving today's business challenges, today



Rockwell Automation
...The world's largest company dedicated to industrial automation and information, makes our customers more productive and the world more sustainable

Passionate People. Innovative Products. Unmatched Results.

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Question ?





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