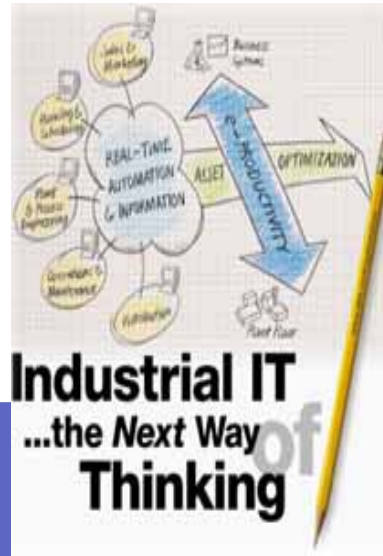




Christer Rameback  
Vice President  
Process Automation



# Process Automation - History and Future



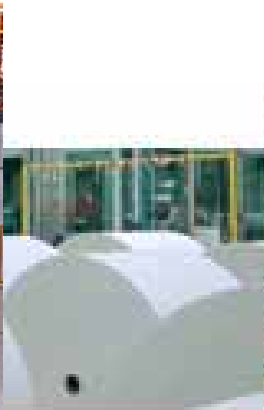
# Facts about ABB



- A leading power and automation technology company with broad industry knowledge and geographic scope
- About 150,000 employees in more than 100 countries
- Leading position (1, 2 or 3) in each industry we serve and within our product areas
- Headquarters: Zurich, Switzerland



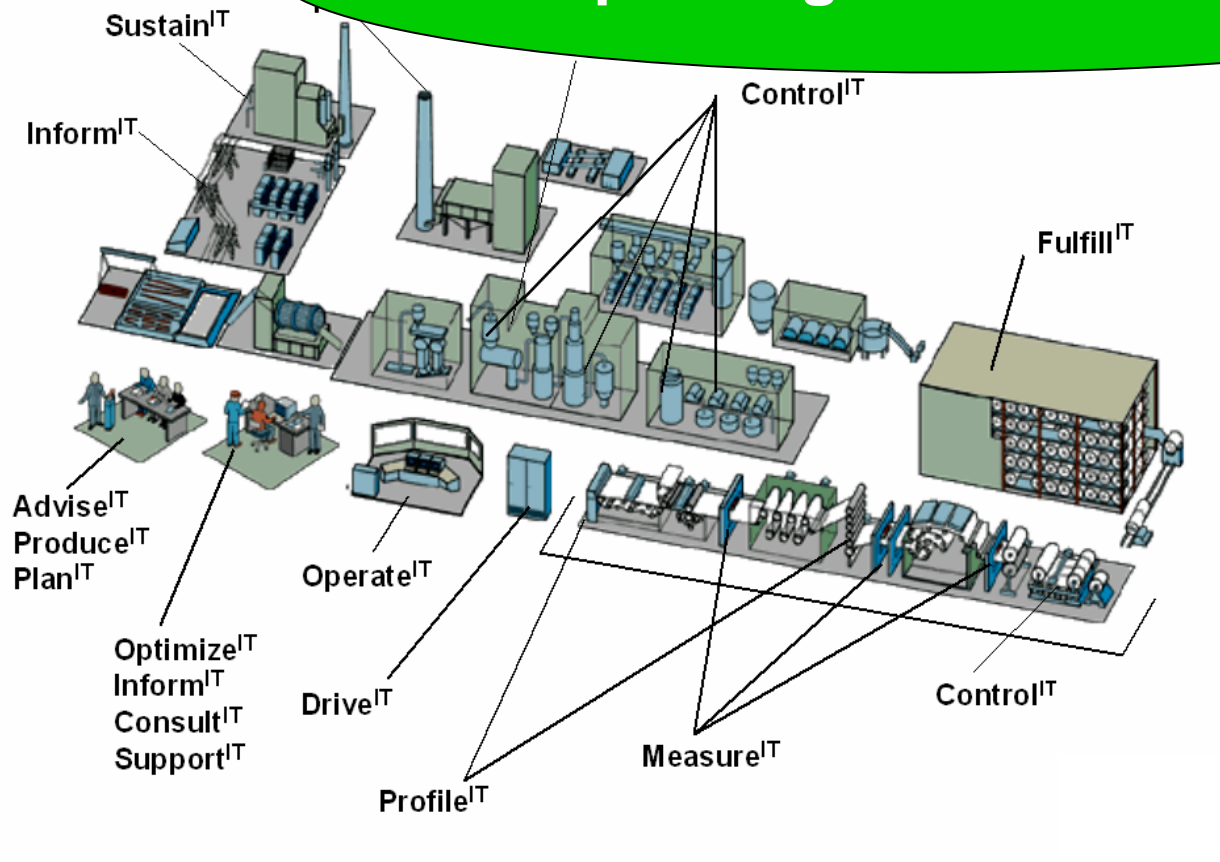
# Process Automation Systems



# Listening to the users

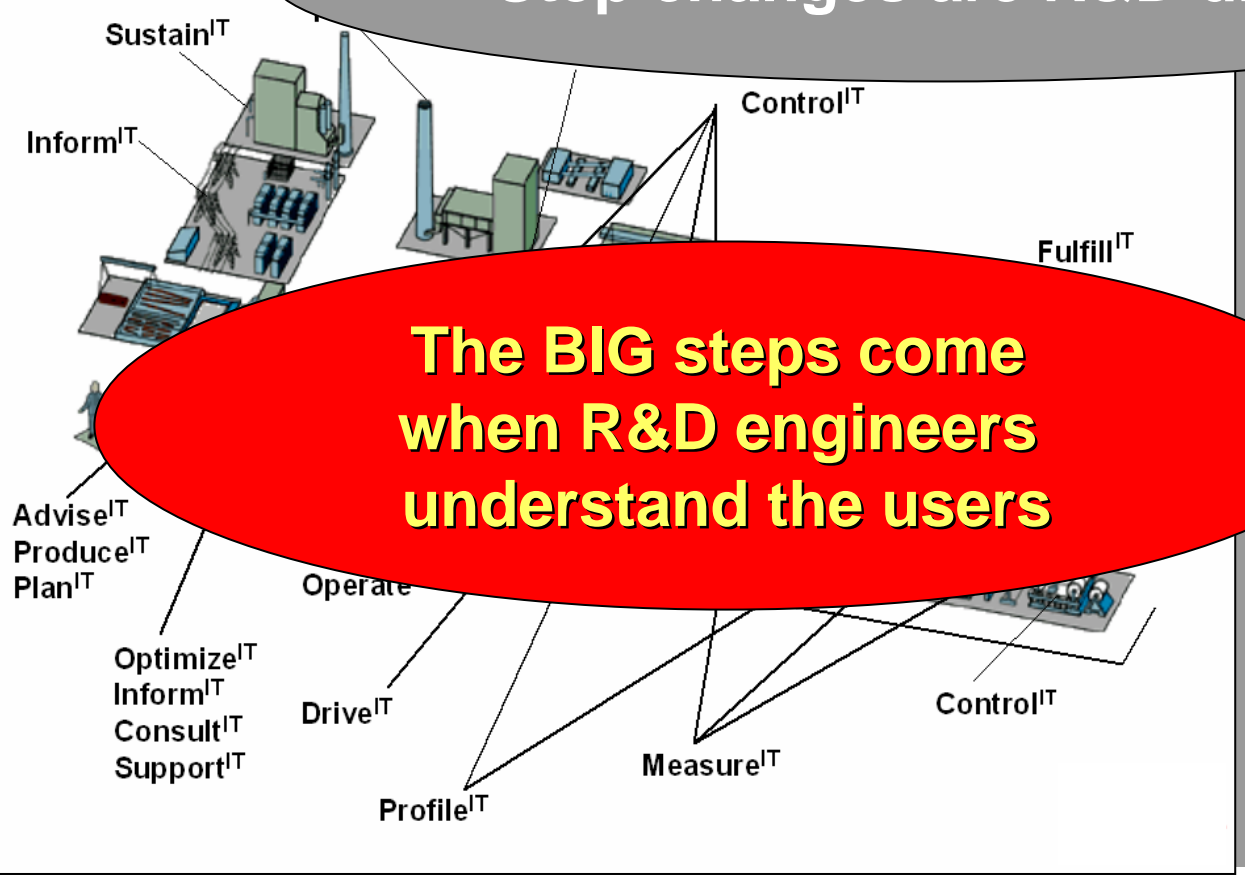
Continuous improvements are customer driven

Step changes are R&D driven



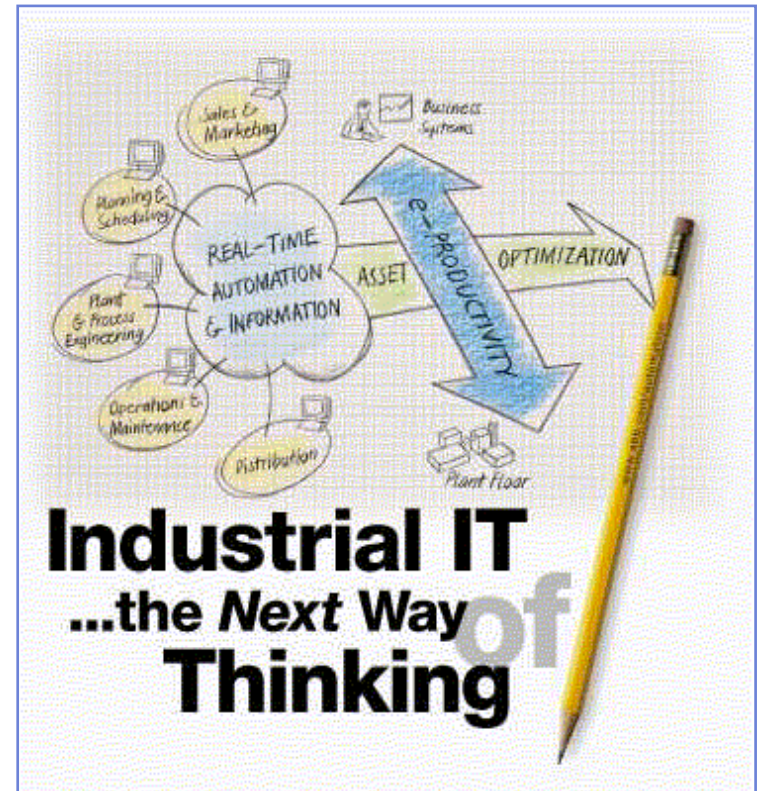


Step changes are R&D driven

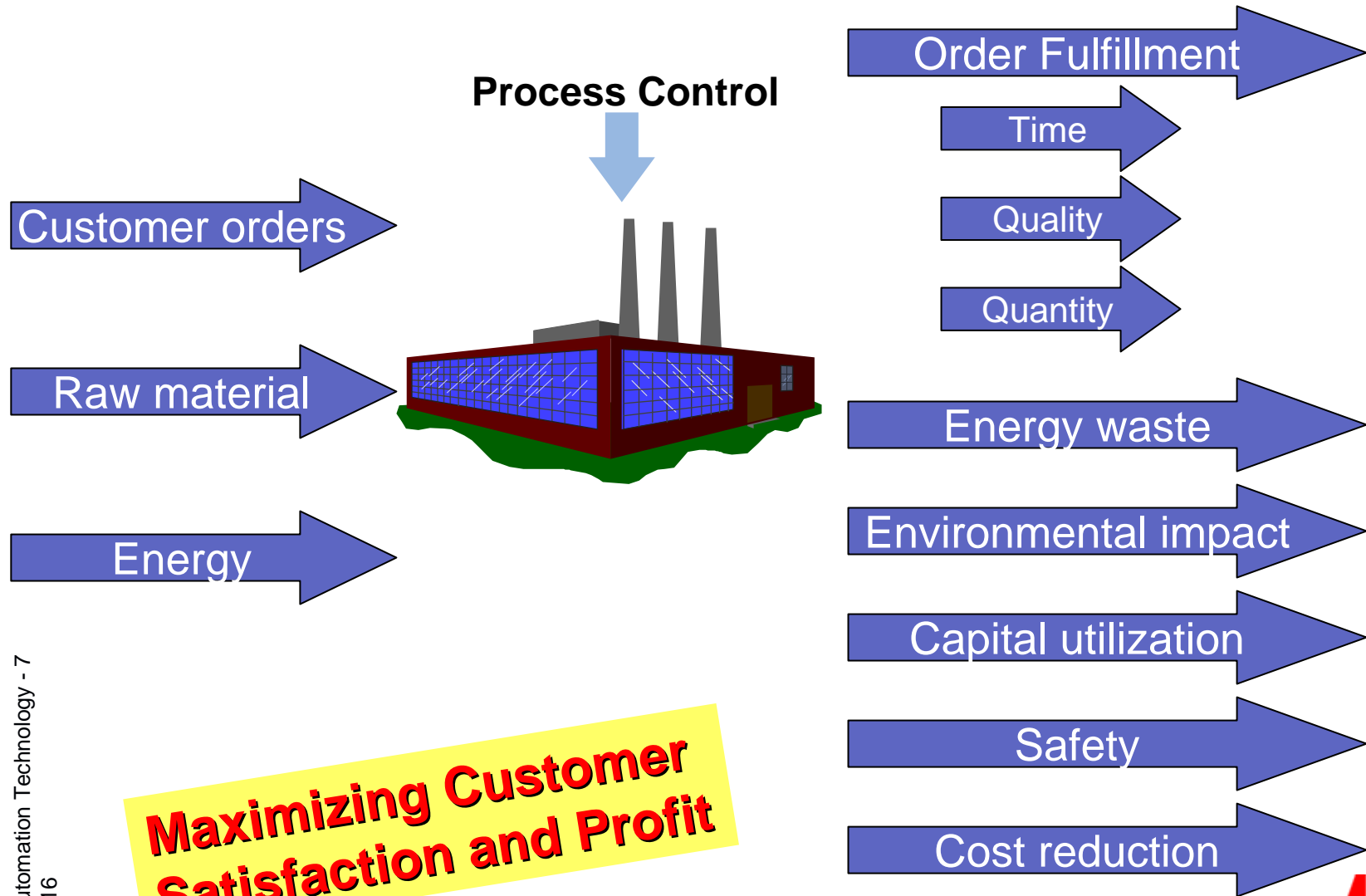


# Agenda

- History of Industrial Automation
- Current situation
- Important aspects for the future



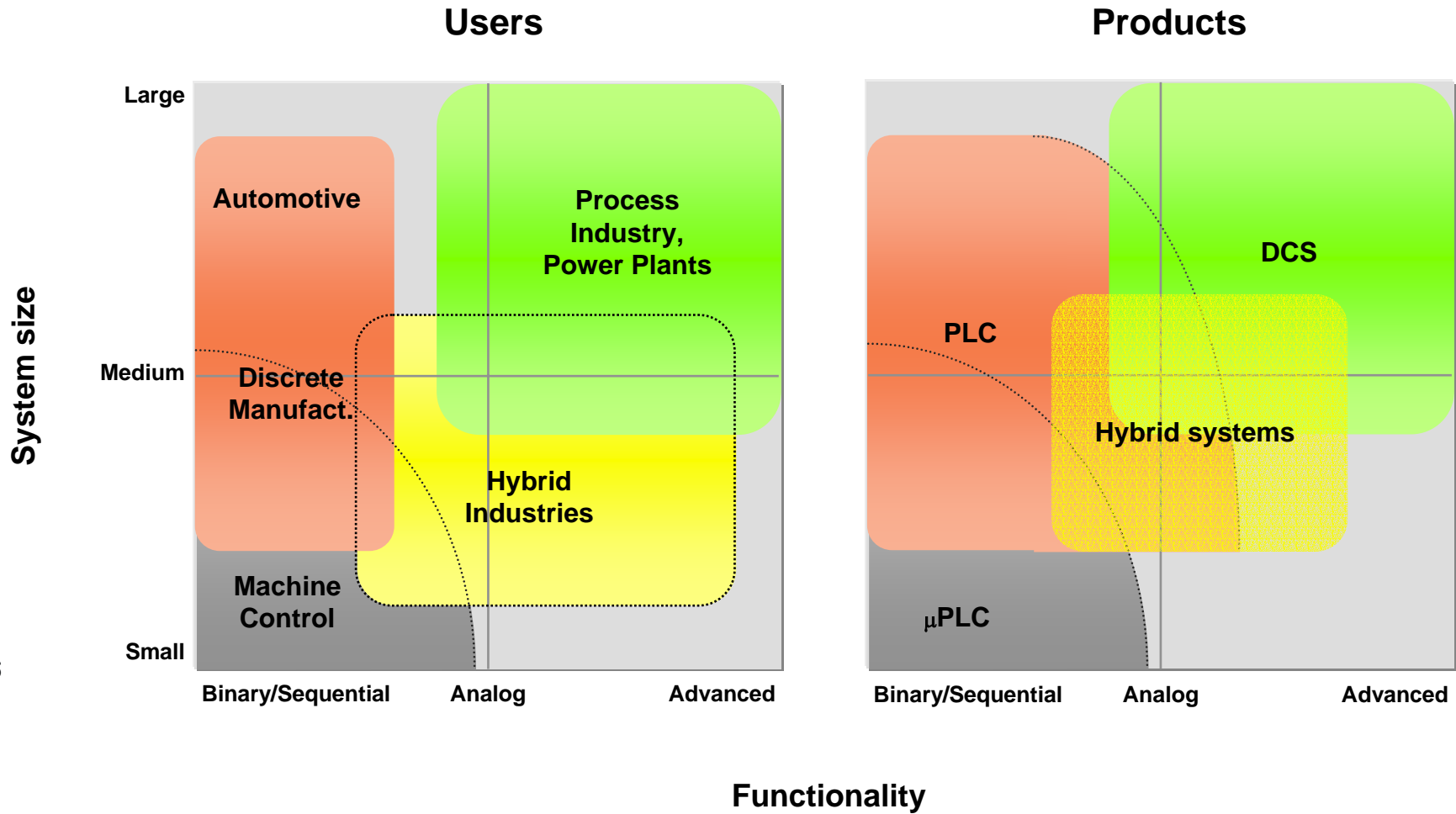
# Simplified business model



**Maximizing Customer Satisfaction and Profit**



# Control systems market



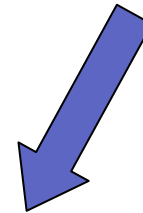
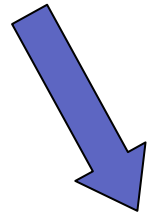
# PLC vs DCS

## ■ PLC History

- Early 1900 – electrification!
- Rolling mills, paper mills, car manufacturing
- Contactors - Relays – Electronic relays with sequences etc – Programmable devices – PLC's
- Early 1970's - Microprocessor based PLC's
- Simple MMC's (Man Machine Communications)
- Limited Information Management Capabilities

## ■ DCS History

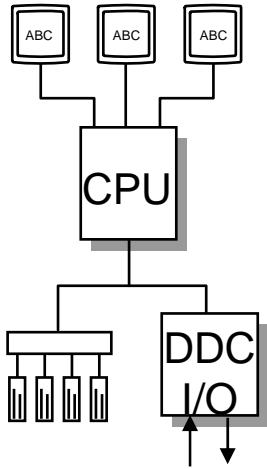
- Early 1900 – oil flow, temperatures etc
- Oil industry, pulp mills, (power plants)
- Manual loops - Mechanical controllers - Pneumatic controls - Electronic controllers – Single Loop Controllers - DCS's
- Early 1970's - Microprocessor based DCS's
- More advanced MMC's
- Somewhat more advanced Information Management Capabilities



Automation System

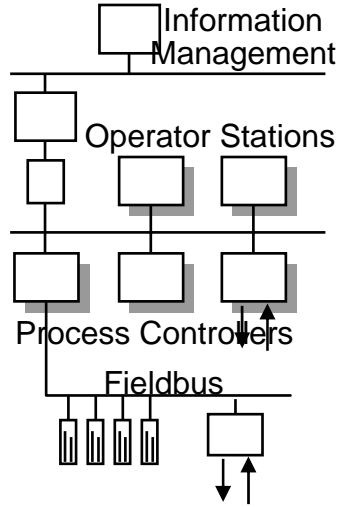


# Evolution of digital control systems



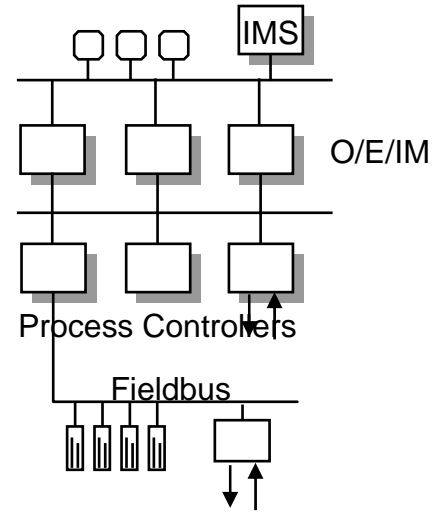
**Centralized**

60's and 70's



**Distributed**

70's, 80's and 90's



**Integrated**

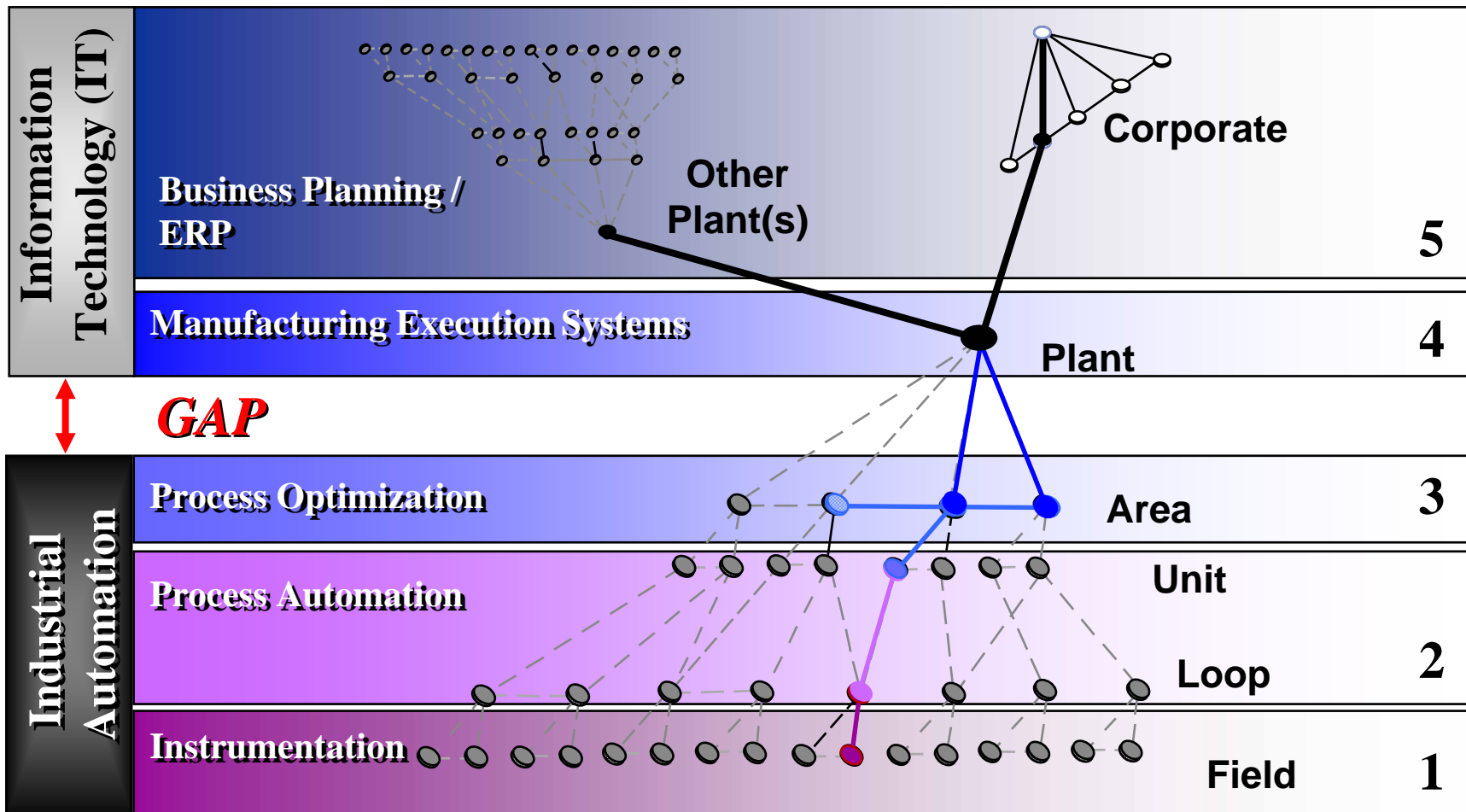
90's and 00's

**Increased complexity**

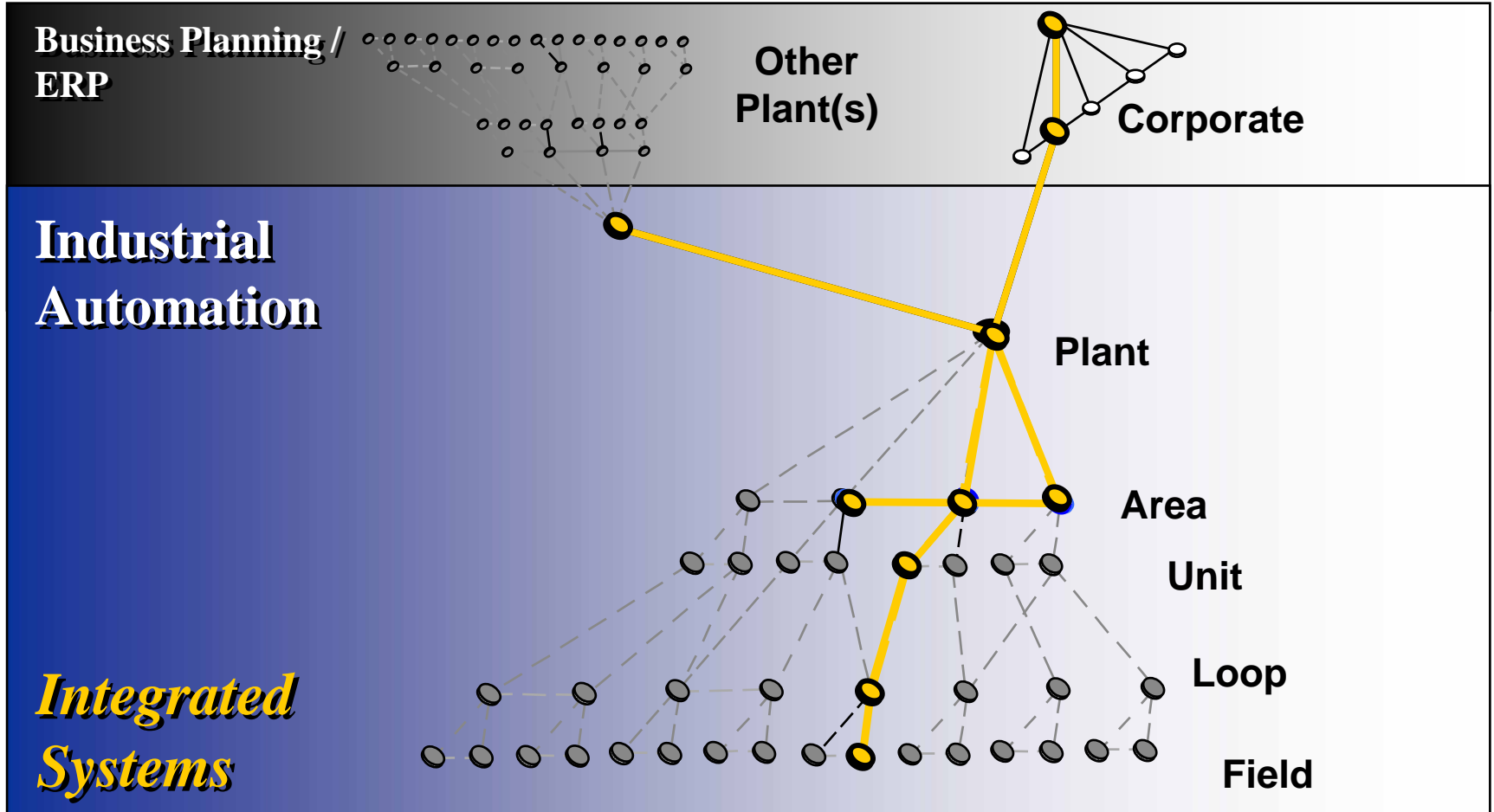
- Improved functionality over time
  - Graphics, Alarms, Control, Information Management, Batch, Communication
- PLC functions vs DCS functions
  - Binary, sequences, speed vs closed loops, alarms etc
- Integrated systems: PLC <-> DCS <-> IMS



# Industrial automation traditional architecture model



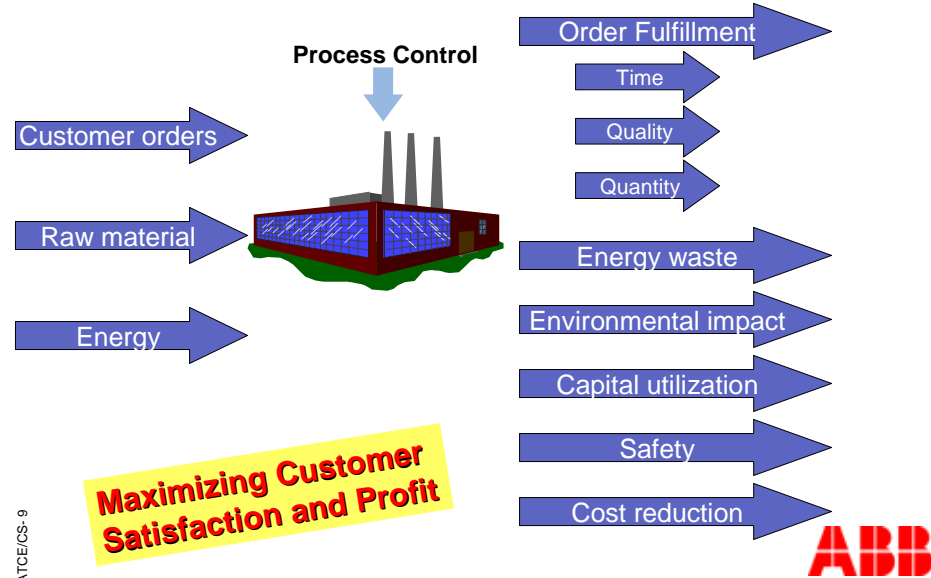
# Industrial automation new architecture model



# Market Forces

Today

## Simplified business model

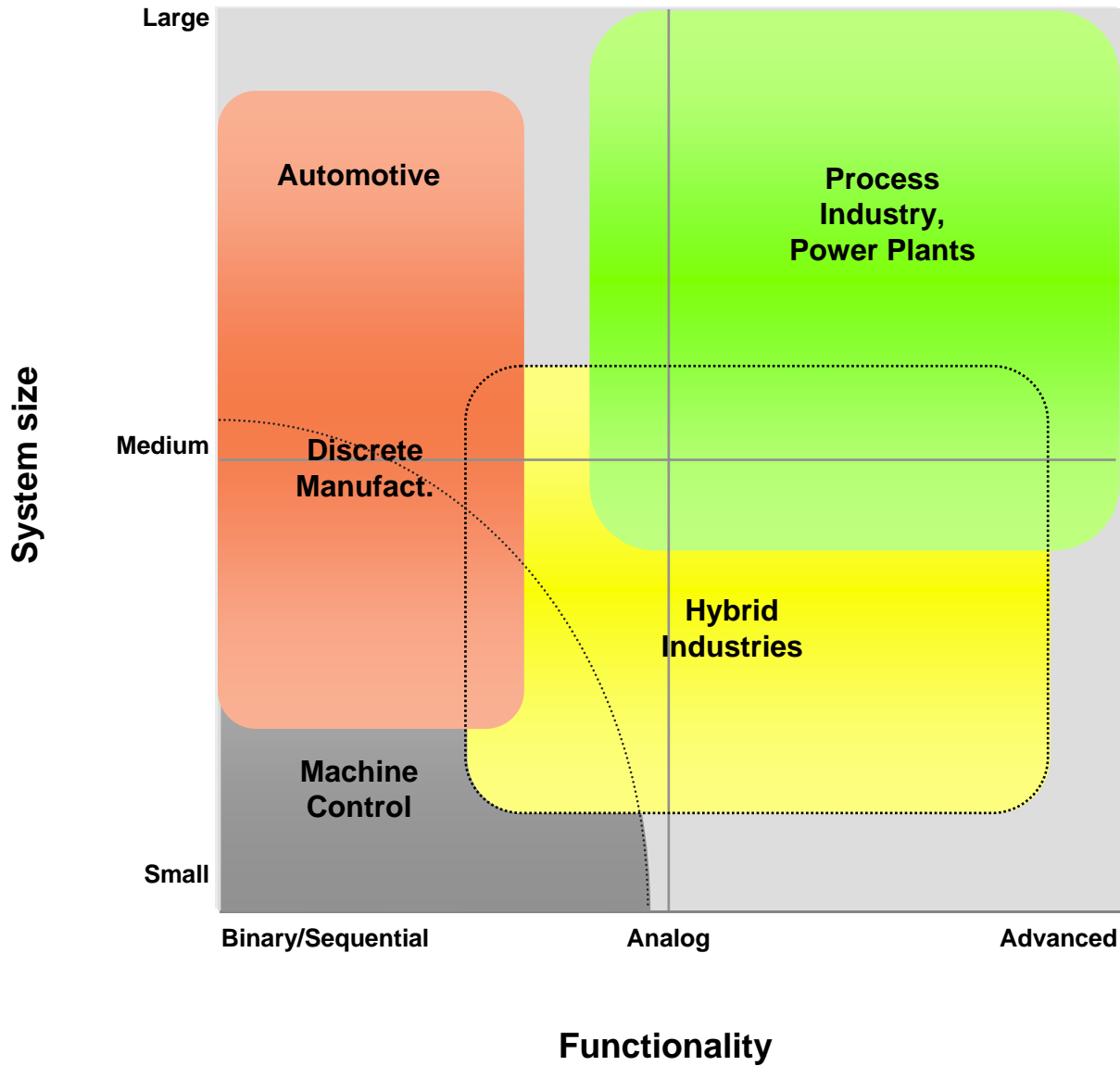


© ATCE/CS-9

- Due to global competition combined with slow market growth, process industries forced to re-evaluate business models and implement continuous improvement initiatives
  - Cutting costs by consolidating, restructuring, and downsizing

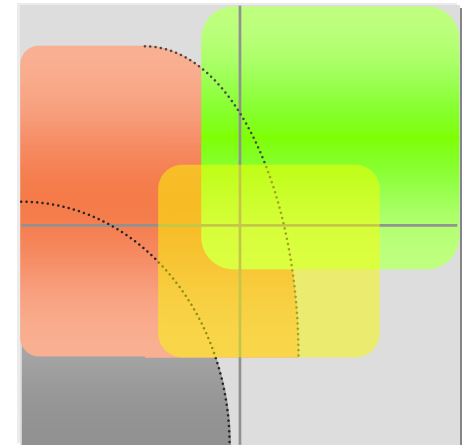
The ABB logo, consisting of the letters 'ABB' in a bold, red, sans-serif font.

# Control systems market



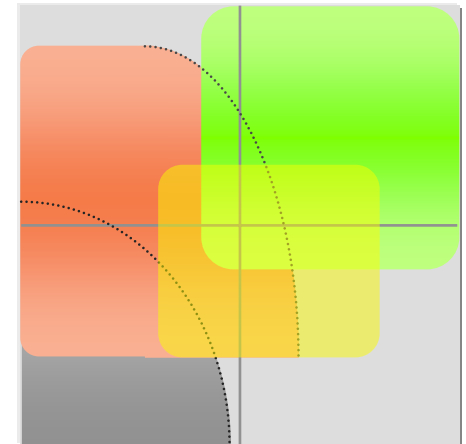
# Control systems market trends

- Changes in the competitive structure
  - Consolidation
    - Too many suppliers and low profit levels
    - Mergers and acquisitions
    - Vertical integration
  - Merging market segments
    - PLC vendors enter the OCS market
      - Siemens, Rockwell
    - The hybrid systems market is common ground
      - ABB, Siemens, Rockwell, Fisher-Rosemount, Honeywell
- Market exits due to increased development costs
  - Shake-out of smaller suppliers
  - Large end users with own control systems outsource

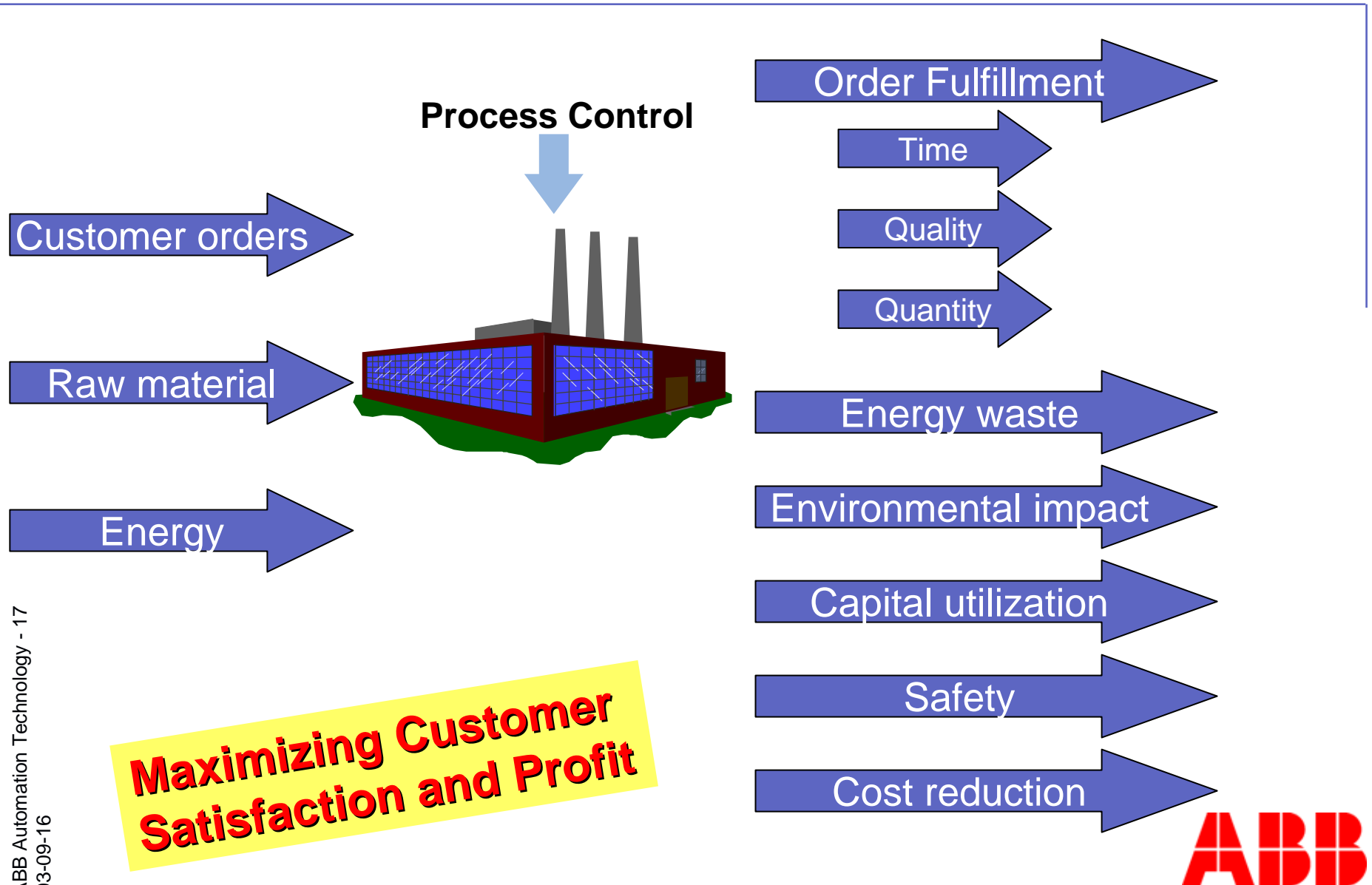


# Control systems market trends

- Control systems become commodities
  - Commodity hardware
    - PC, network components, I/O, ...
  - Decreasing differentiation at basic product level
    - Increasing competition on price
  - Competitive pressure on system components
    - “Unbundling”
- New product strategies
  - Broader scope of functionality
  - Unified systems: OCS + PLC + Safety + Scada
    - ABB, Siemens, Honeywell/Rockwell
  - Collaborative systems
    - Plant Automation, Asset Optimization, Business Systems



# Simplified business model



**Maximizing Customer Satisfaction and Profit**



# Important factors

Operators role

Asset optimization

Engineering efficiency

Advanced control

Environmental impact

Information management

Integrated safety

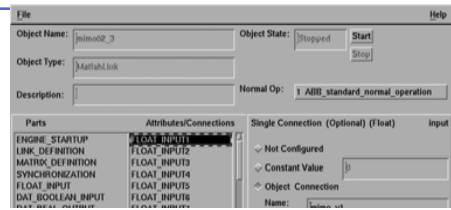
System migration

Scalable solutions

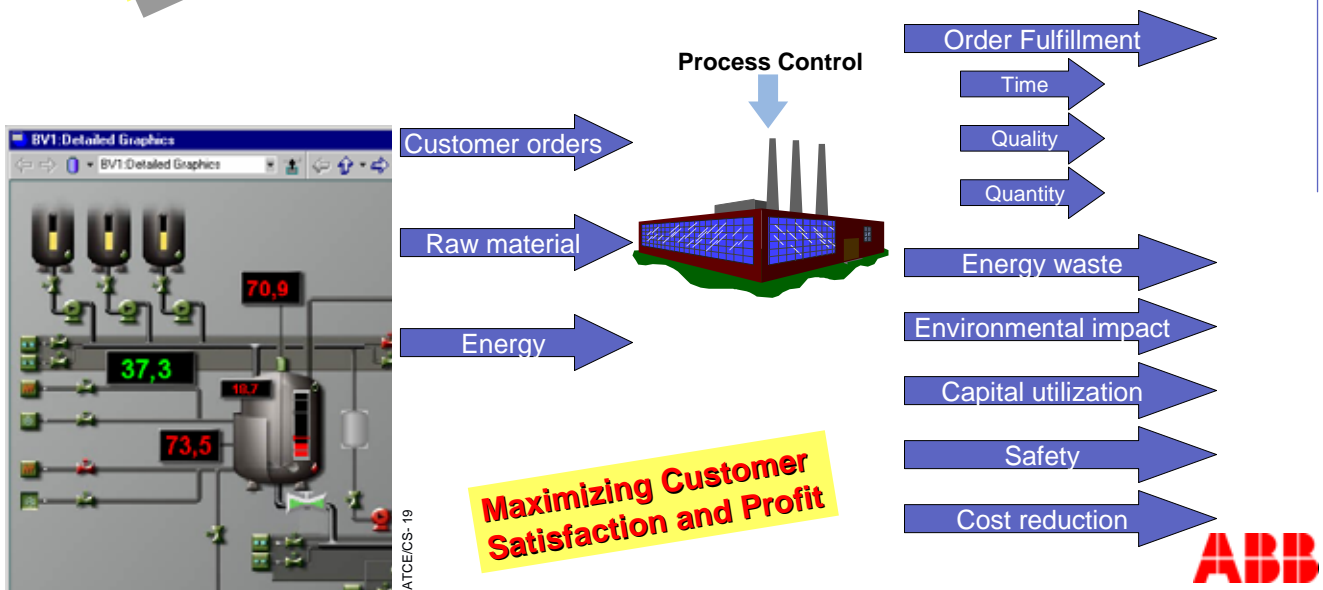


# The operator's extended role

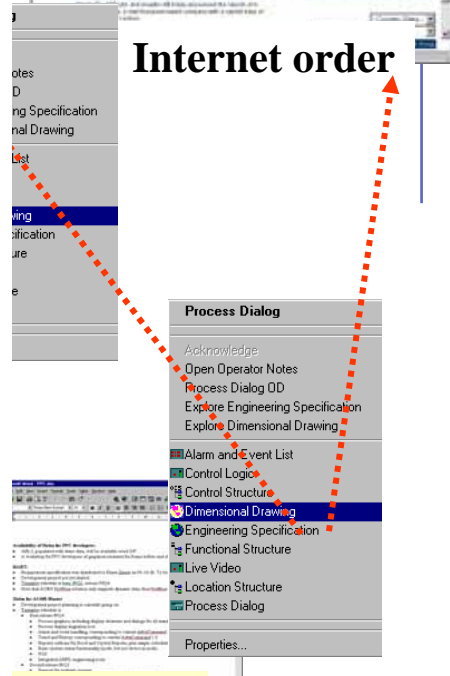
**Operators role**



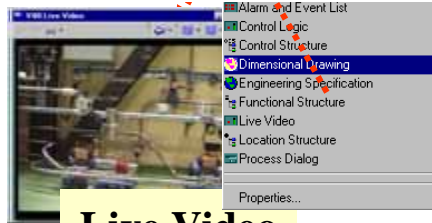
## Simplified business model



## Internet order



**Eng Spec**



**Live Video**

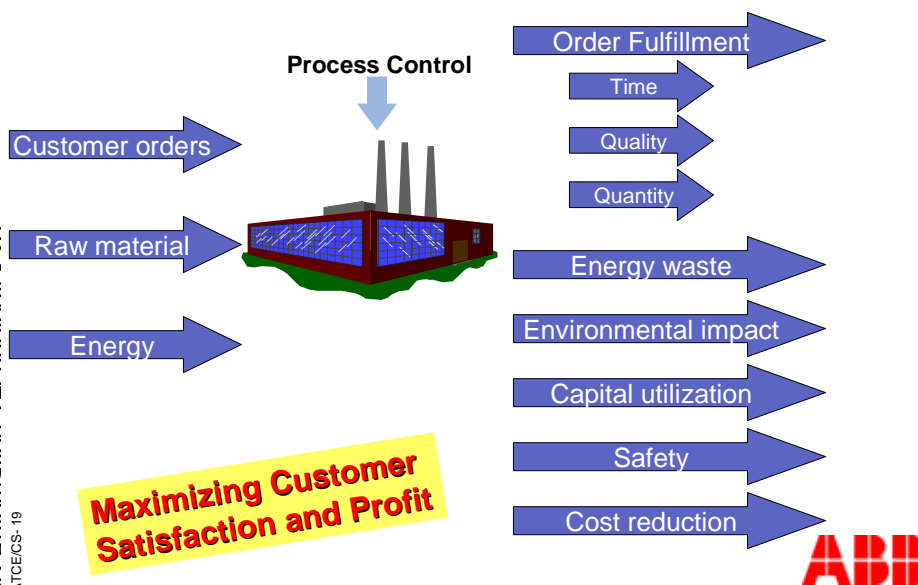


# Improved car worker efficiency

1. Assembly robot stops
2. Operator calls maintenance personnel
3. Wait 15 min
4. Maintenance person inspects control program
5. Maintenance person fixes the problem



## Simplified business model



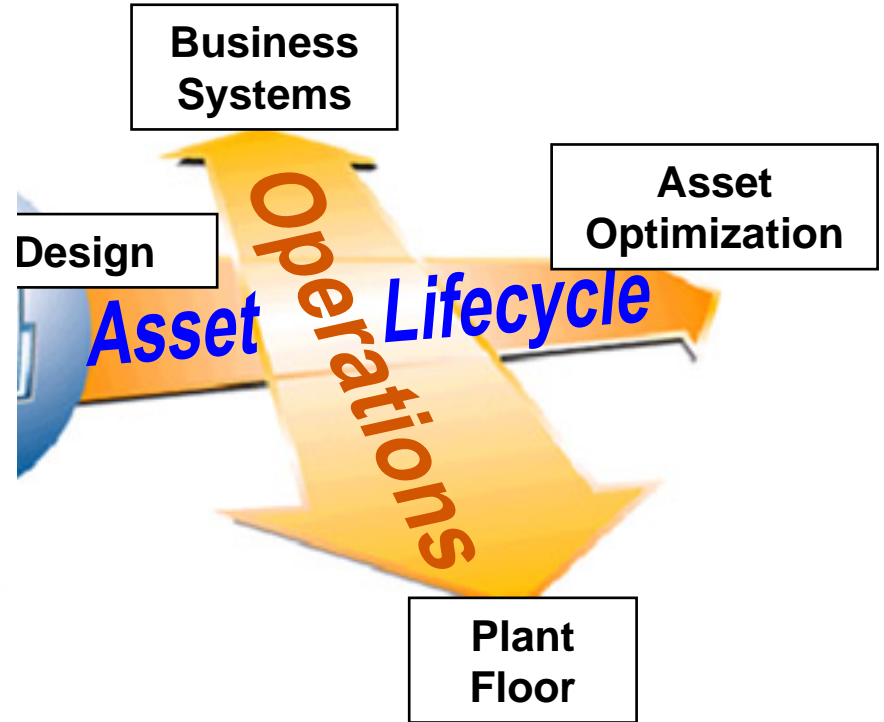
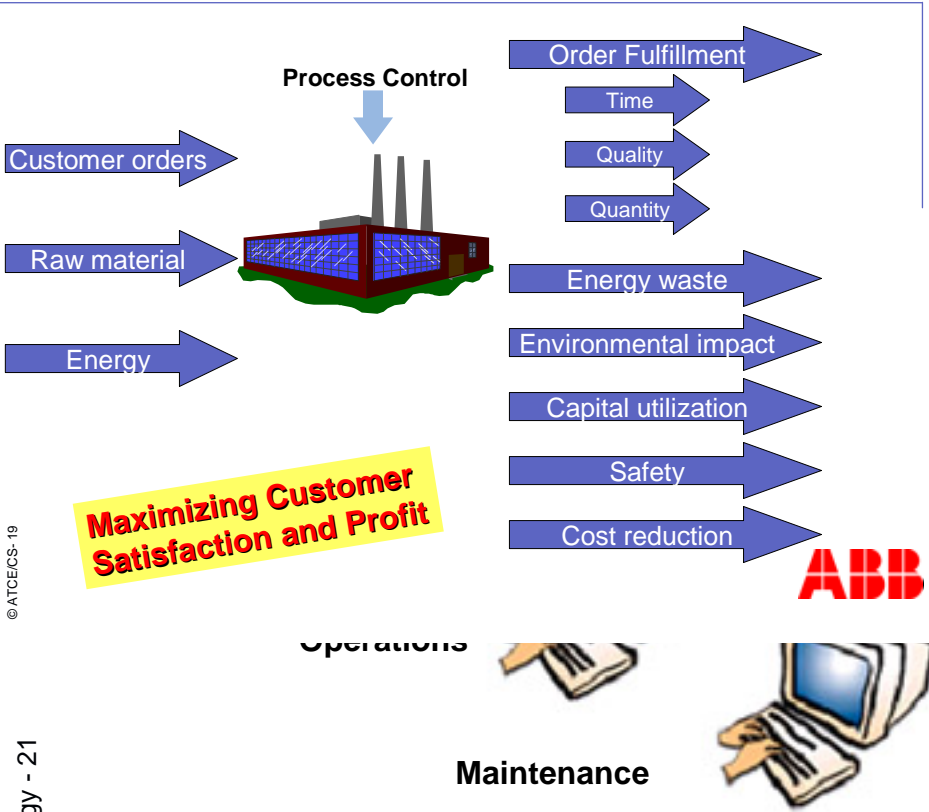
**50% utilization level of manufacturing equipment**

**Assembly robot stops  
Operator checks with local PCn  
The system is guiding the operator to root cause  
Operator fixes the problem**

**ABB**

# Asset Lifecycle and Engineering

## Simplified business model



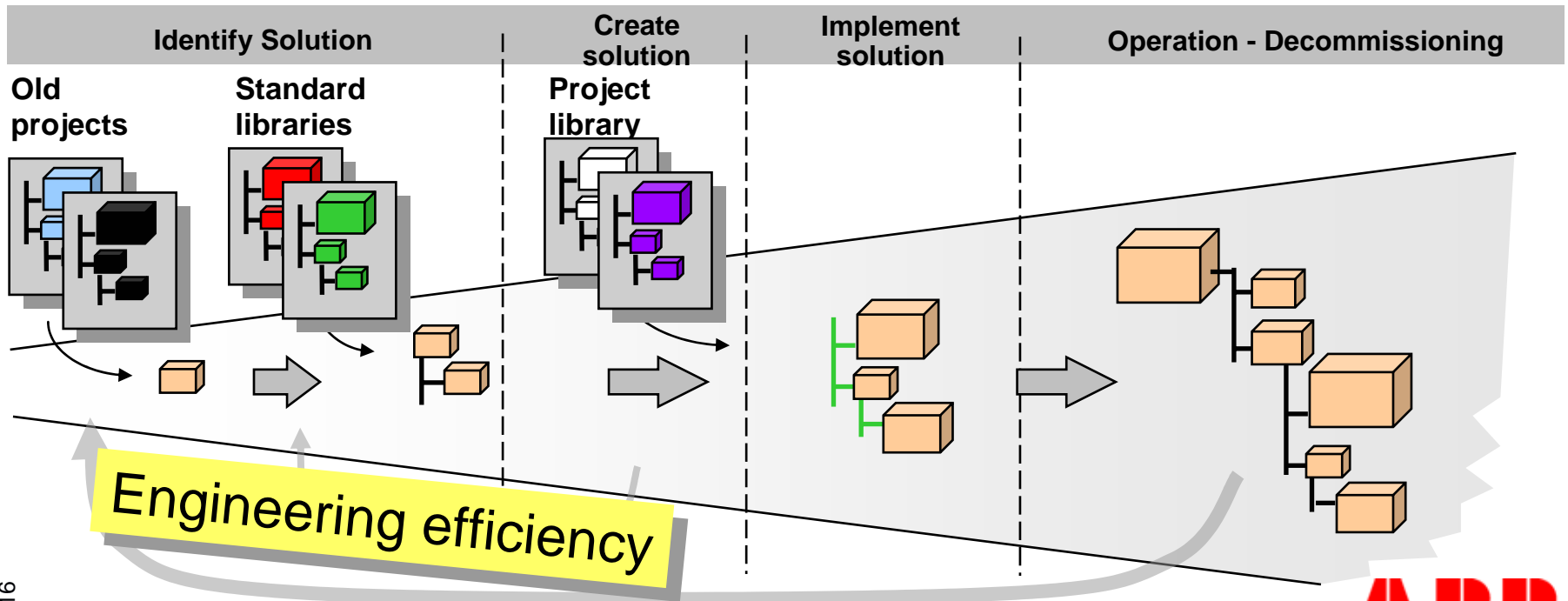
Engineering efficiency

Asset optimization



# Re-Use of solutions

- Engineering Efficiency taken to the Next level:
  - Re-use of solutions with ALL Aspects included
  - Libraries of Typical Solutions with ALL Aspects
  - Copy & Paste of complete process areas
  - Inheritance -> Update type and all instances are updated!

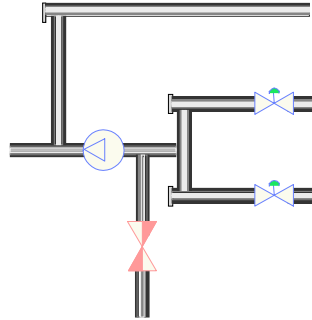


# Plant Modeling - Object Hierarchies

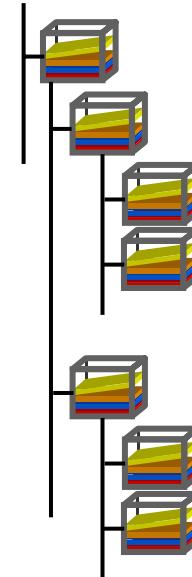
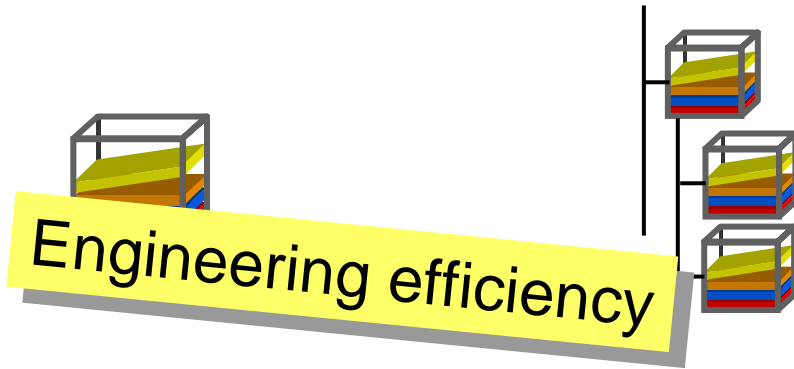
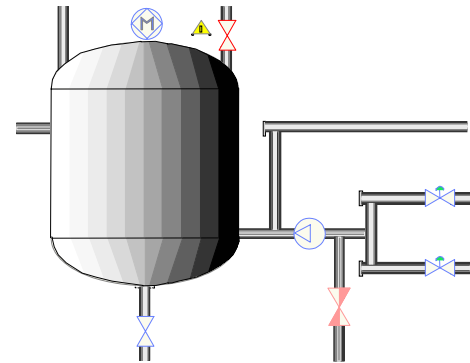
Valve



Heating System

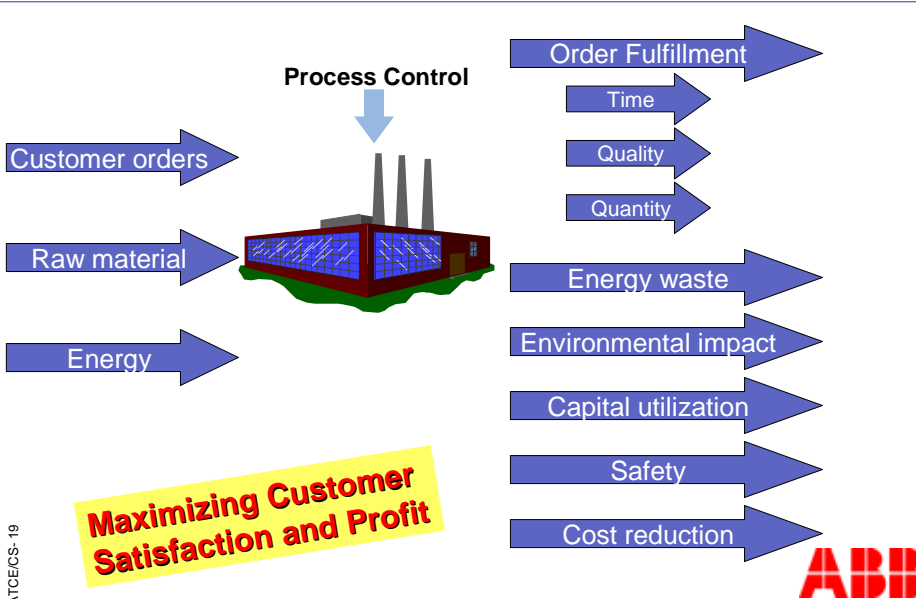


Reactor



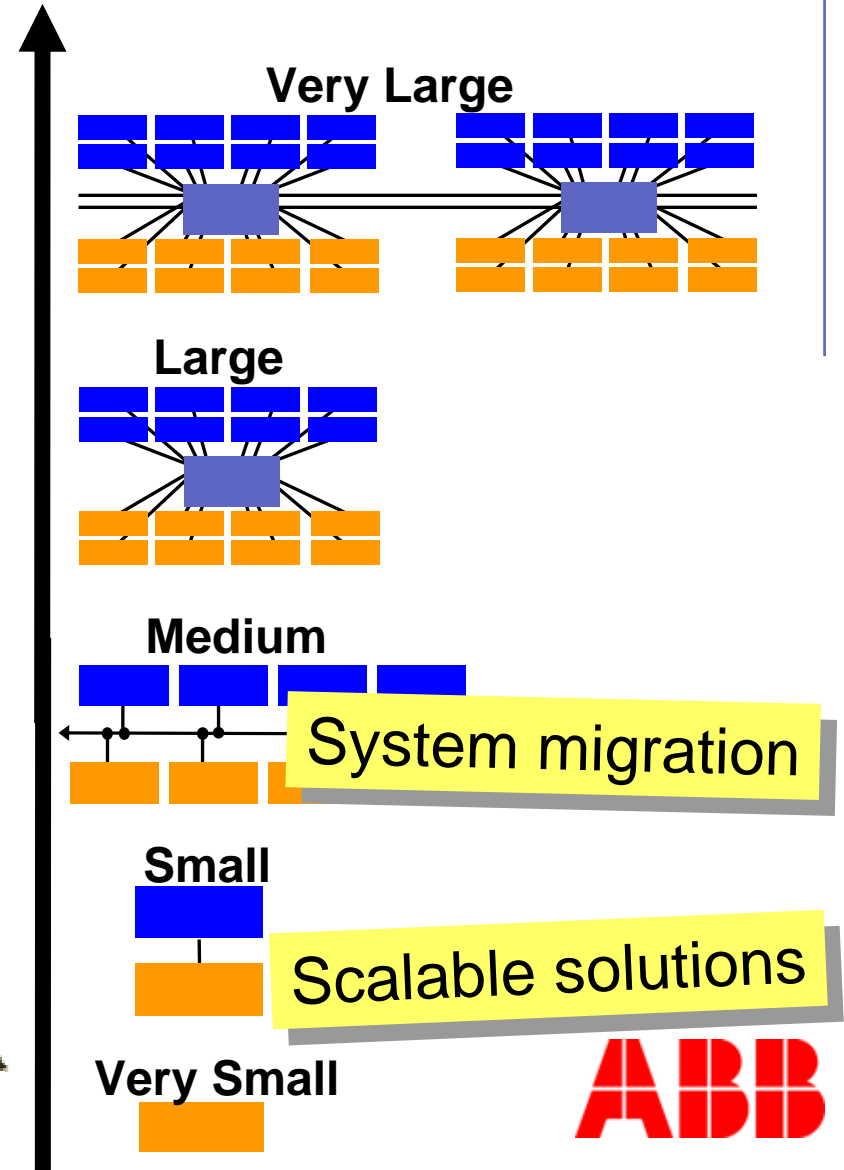
# Highly Scalable Solutions

## Simplified business model



**Maximizing Customer Satisfaction and Profit**

- Pay for what you need.
- Use the same software for Engineering & Operations irrespective of solution size.



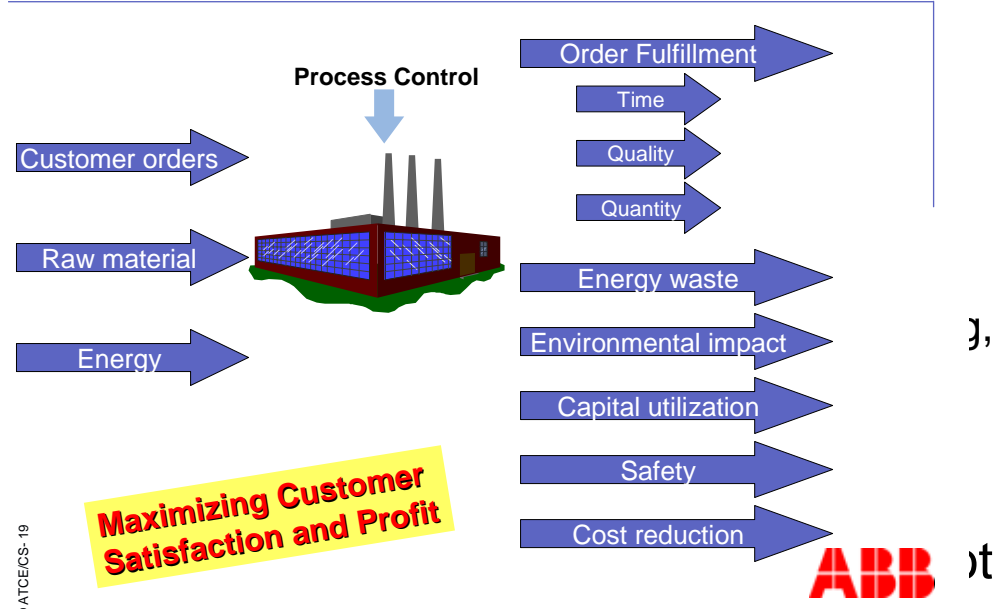
# Market Forces



“Over \$20 Billion USD, or almost 5% of total North American production is lost each year due to unscheduled downtime.”  
 – ARC Insights

**Asset optimization**

## Simplified business model




**Maximizing Customer Satisfaction and Profit**

### strategic opportunity

- Viewed as overhead, Maintenance is target of management’s cost cutting strategies
- Yet, unexpected failures and poor quality product can be devastating to profit goals



# Achieving Operational Excellence



“Plant Asset Management systems providing real-time asset performance information to operations and maintenance will increase Return on Assets (ROA) and lead to operational excellence.” – ARC Insights

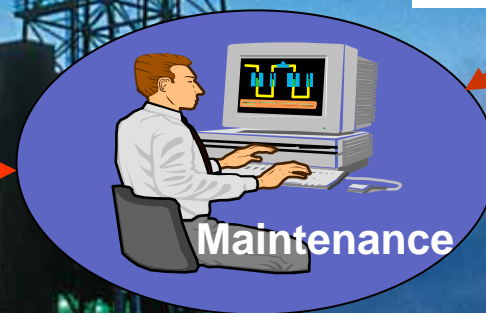
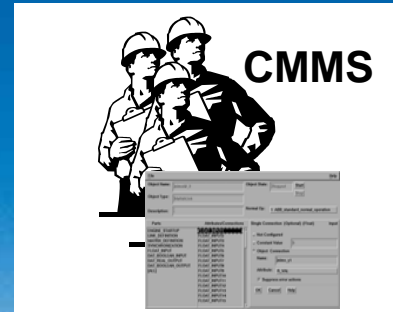
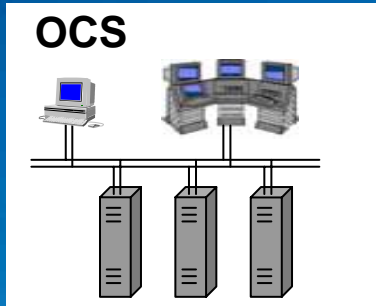
- Balancing act between high availability and low cost demands requires a proactive business strategy with clearly defined metrics
  - Continuous Improvement programs require real-time assessment of Key Performance Indicators (KPI)
  - Measure asset performance and identify performance gaps and opportunities
- Unfortunately, traditional maintenance systems lack real-time information
  - Provide schedule-based functions

Asset optimization



# Traditional Operation and Maintenance

Trends

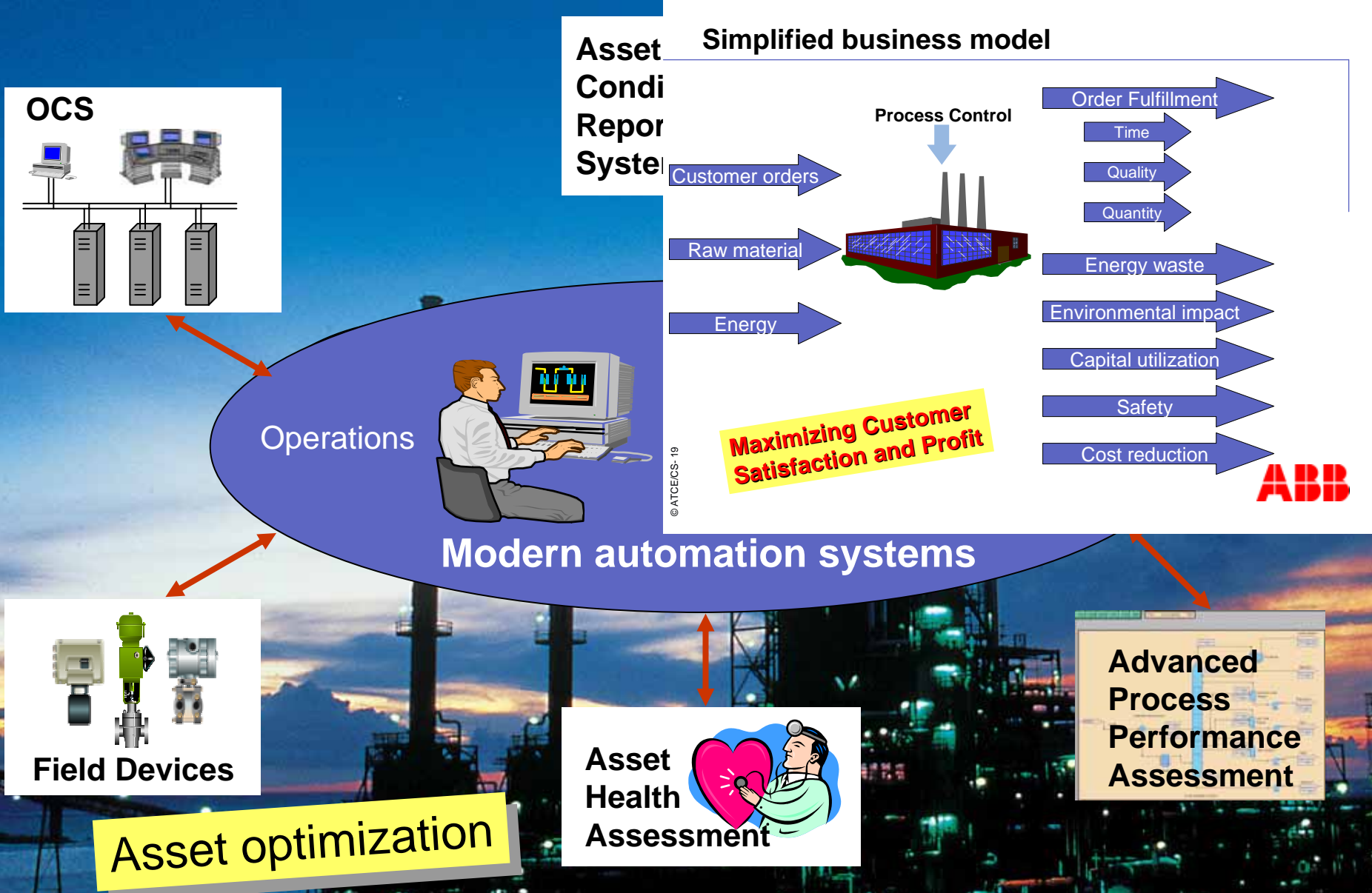


- In a typical day, maintenance will waste 40% of its time determining root causes of problems

Asset optimization

# Real-Time Plant Asset Management (PAM)

Trends



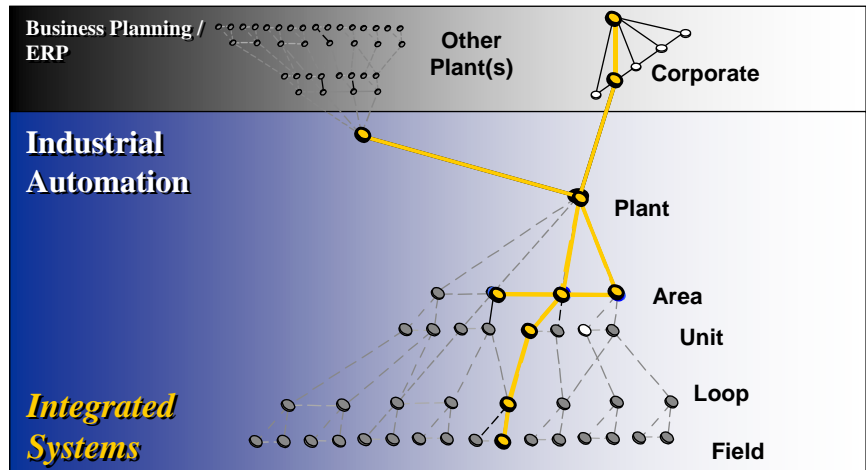
# Can you supply 2 tons in 10 days for 945 dollars?

Answer in ten minutes.

Information management

## Industrial automation new architecture model

Today

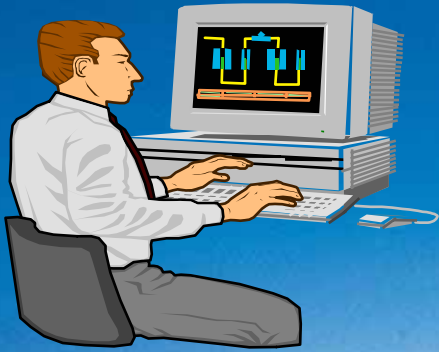


# Safety first!



- Safety is playing an increasingly important role both for Process Industries and Manufacturing Industries
- Avoiding Human AND Environmental impact
- Integrated in control systems
- Moving away from “hard wired” solutions

Integrated safety



- Environment is not "free" anymore!
- Environmental fees are being charged to companies
- Tracking, reporting and **REDUCING!**

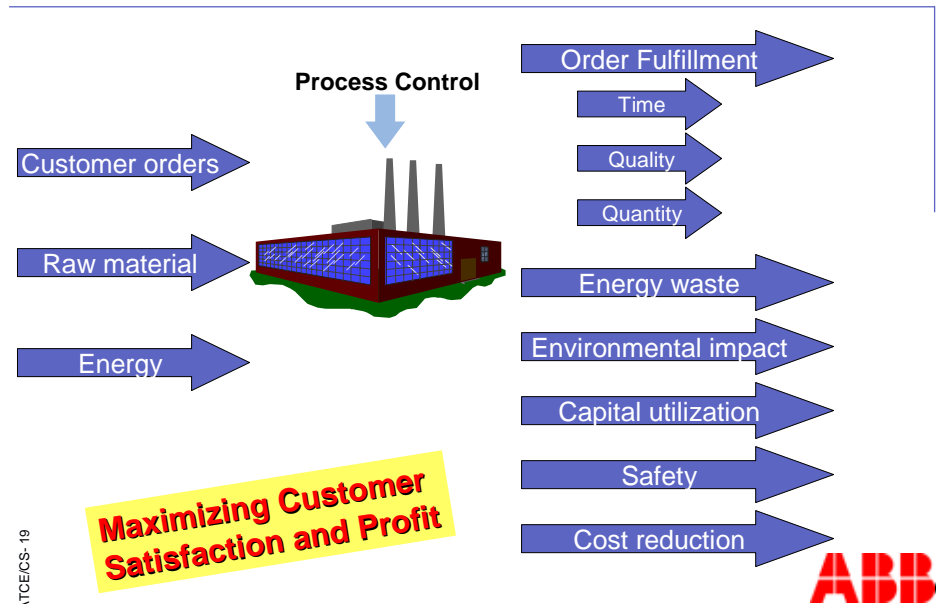
Environmental impact

# Summary



- Integrated systems
  - DCS – PLC – IMS – ERP
- Increased complexity
- Increased competition
  - Users
  - Suppliers
- Operator's extended role
- Information Management
- Asset Management
- Scalable Solutions

## Simplified business model



**ABB**

**ABB**



Christer Rameback  
Vice President  
Process Automation



## Process Automation - History and Future



# Thank You!

