



Automation trends in Breweries

**Brewery
Automation**



Process Technology
From Malt intake to Filling & Packaging



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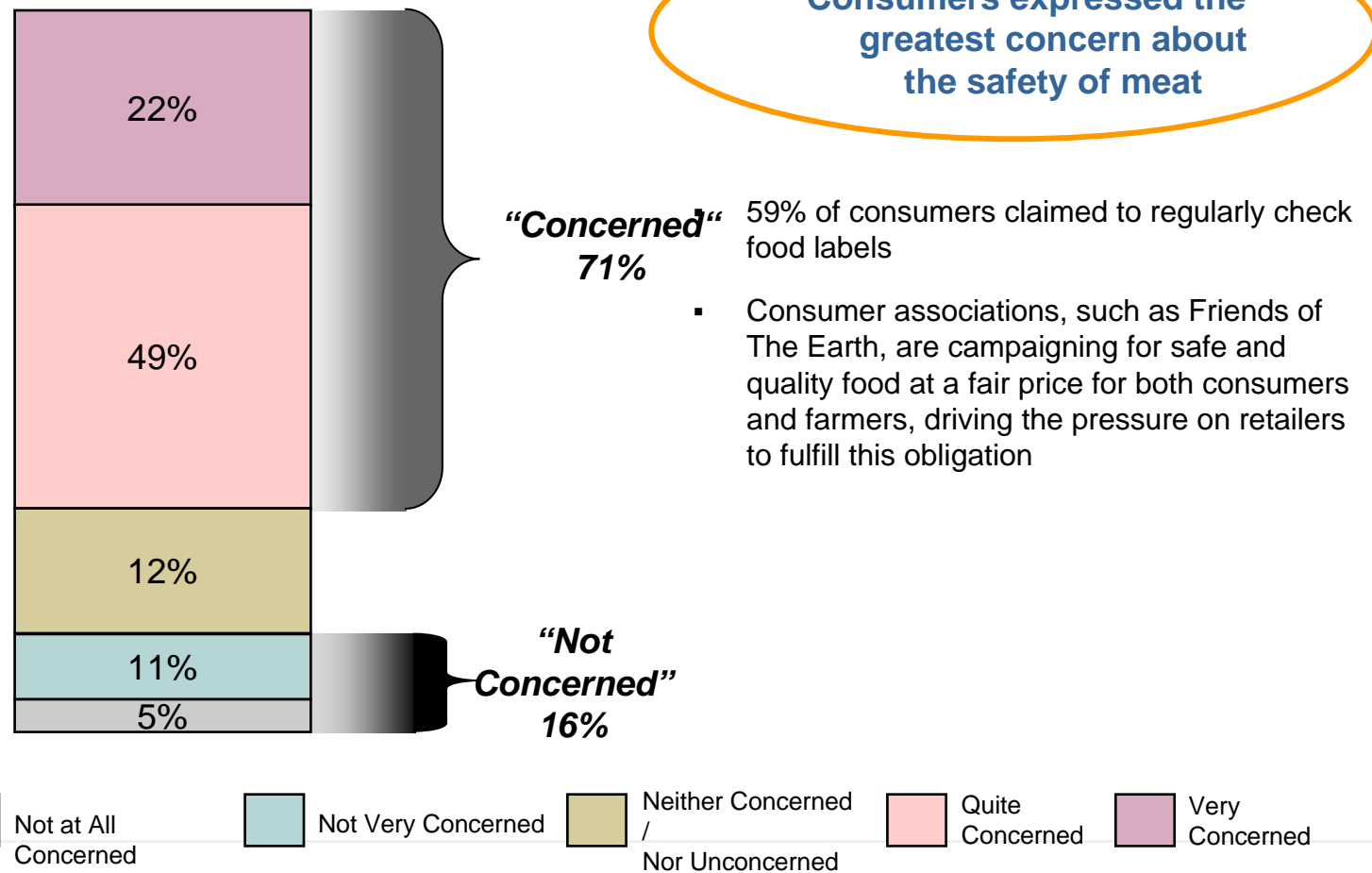


Leading industry trends (customers)

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Consumers are becoming increasingly aware and concerned about the safety of the food they eat

Consumer Attitude to Food Standards
Food Standards Agency, UK 2002





Leading industry trends (legislation)

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In addition to retailer pressure, legislators' demands are growing, both in response to consumer concern and the increased perceived threat of bio-terrorism

HACCP (Hazard Analysis & Critical Control points)

To keep pace with legislation, suppliers will have to put in place sustainable solutions – regulatory requirements are getting progressively tighter and more demanding, not less

General Product Safety 92/59

1990 — Food Safety Act 1990

2000 — Meat labelling Directive 1760/2000

2001 — GPS Directive 2001/95 (enhanced)

2002 — EU Directive 178/2002 Article 18

Bio-terrorism Act 2002

2003 — FDA Proposals, 6 May 2003

There has been a clear trend towards increased regulatory control since 2000



Market situation has created many challenges

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Market Situation

Evolving Market

- Consolidation, M&A, Integration
- Changing consumption patterns
- Local and premium brands



Regulatory Requirements

- Food Safety
- Traceability
- Packaging & Waste Directive



Global / Distributed Manufacturing

- Flexibility, Cost Pressures
- Capacity Rationalization
- Complex IT legacy



Marketing & Technology

- Global Branding Strategy
- Product Diversification
- Evolving Technology



Resulting Challenges

Secure / Increase Market Position

- Timely access to new markets
- Increasing pressure on prices
- Image / Brand protection



Supply Chain Management

- Integrated Quality / Quality Control
- Safety and Recovery
- Integrated traceability solutions



Operational / Prod. Excellence

- Economies of scale / optimization
- Low cost operations
- Equipment standardization



Cost to Innovation

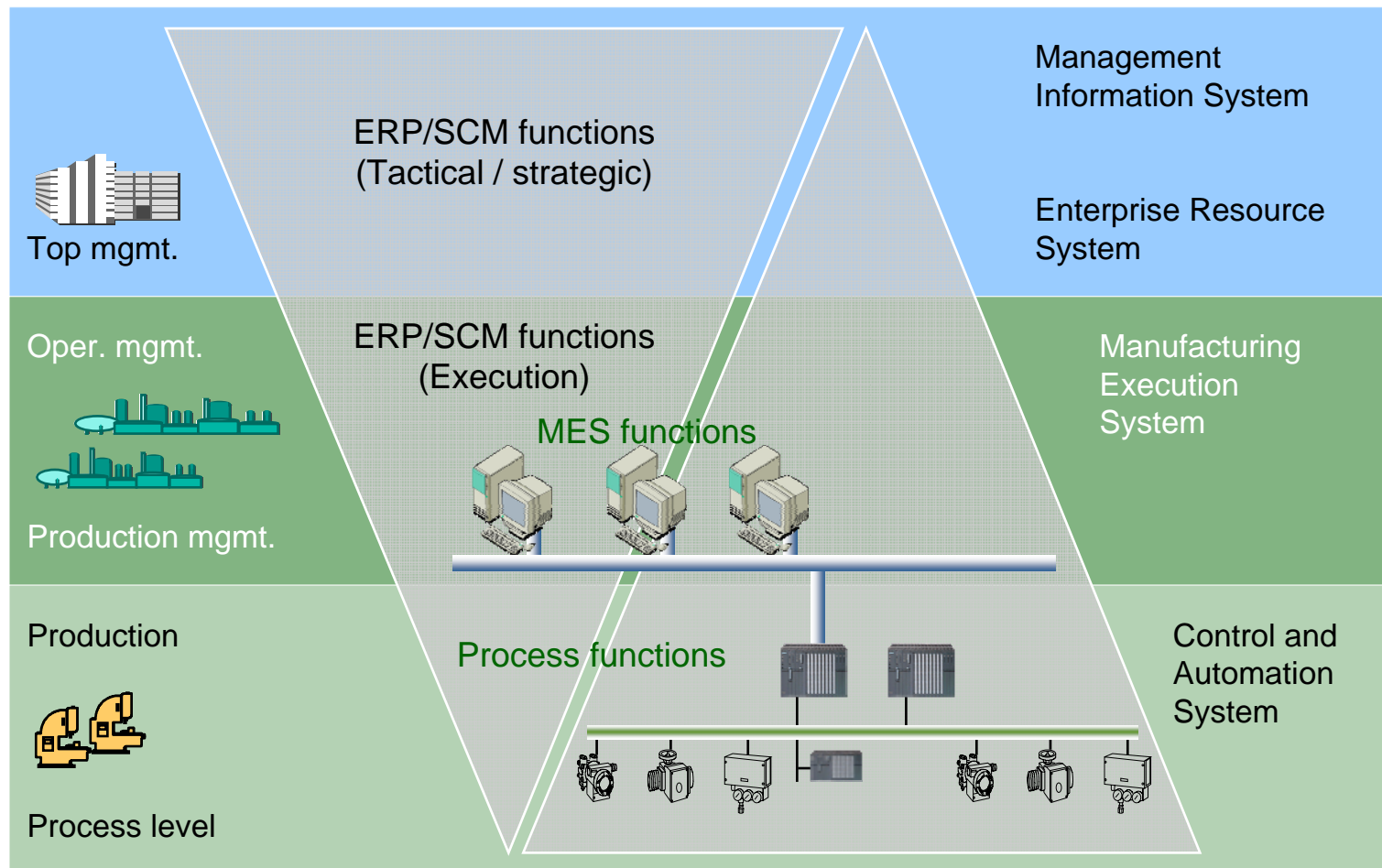
- Consistent quality
- Asset Management
- Fast time-to-market



Increased productivity with vertical integration



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Trends on Manufacturing Field Level

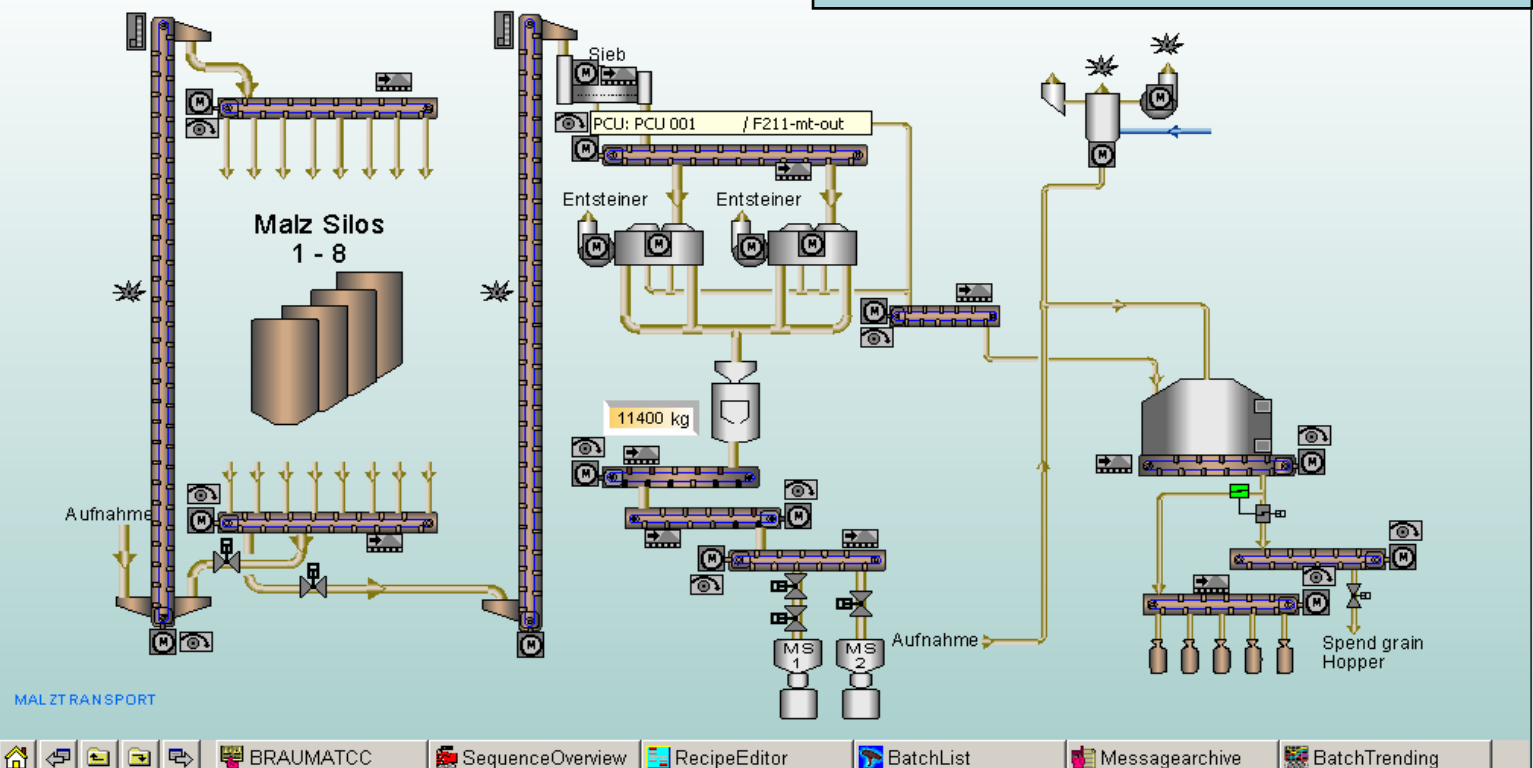
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Process Units

- Malt Intake
- Malt Transport
- Malt Weighting
- ...

- Automation based on PLCs
- Smart Switchgears, MCCs, Drives, Weighting Systems on fieldbus (Profibus DP)
- Standardisation of fieldbus

- reduction of installation time and costs: cables, cabinets
- diagnostics
- Asset Management
- No dependence to an Electrical Manufacturer





Trends on Process Field Level

Brewery Automation

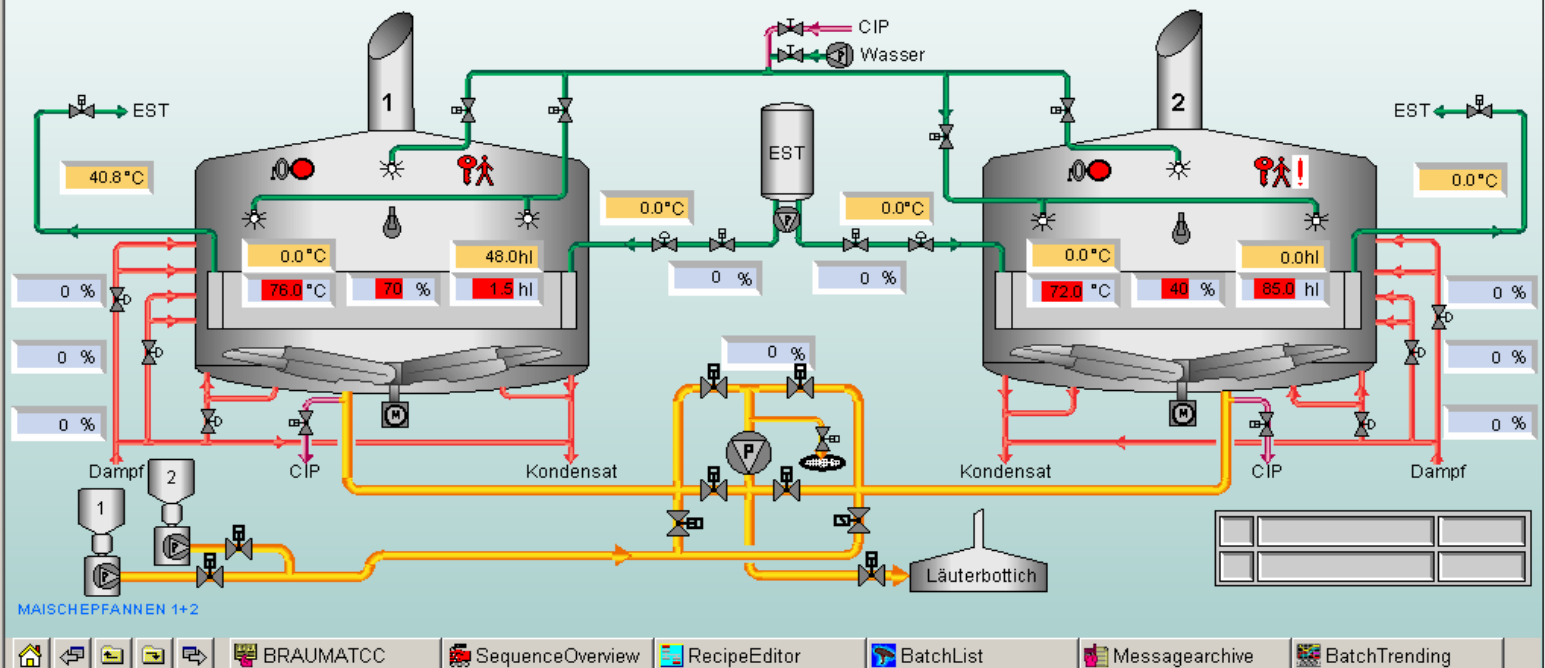
Process Units

- Lautering
- Mashing
- Fermentation
- Maturation...

- Automation based on PLCs or DCS
- Smart Transmitters, Analytics on fieldbus

(FFF or Profibus PA)

- Online configuration
- Fast setup time
- diagnostics
- Maintainability (automatic download of parameters after failure)
- Asset Management





Trends on Automation Level

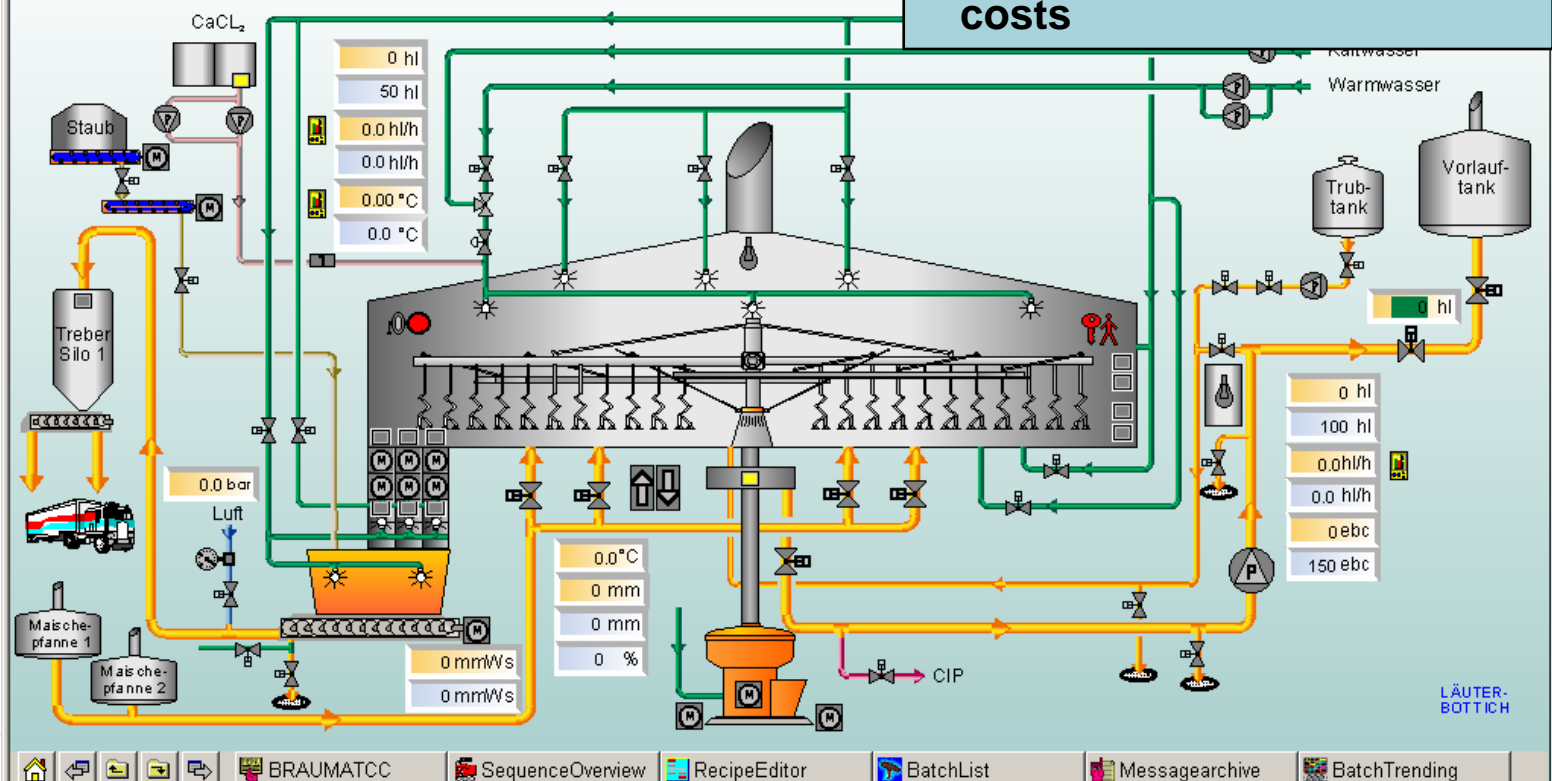
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Process Units

- Lautering
- Mashing
- Fermentation
- Maturation...

- Central and remote Control
- Batch System (S88), Libraries
- Ethernet as Control Network
- Improvement & standardisation of Engineering Tools (IEC 1131)

- reduced cycle time, increased repeatability
- increased Flexibility
- Openness
- reduced Engineering, Training & Maintenance costs





Trends on Monitoring & Operation Level

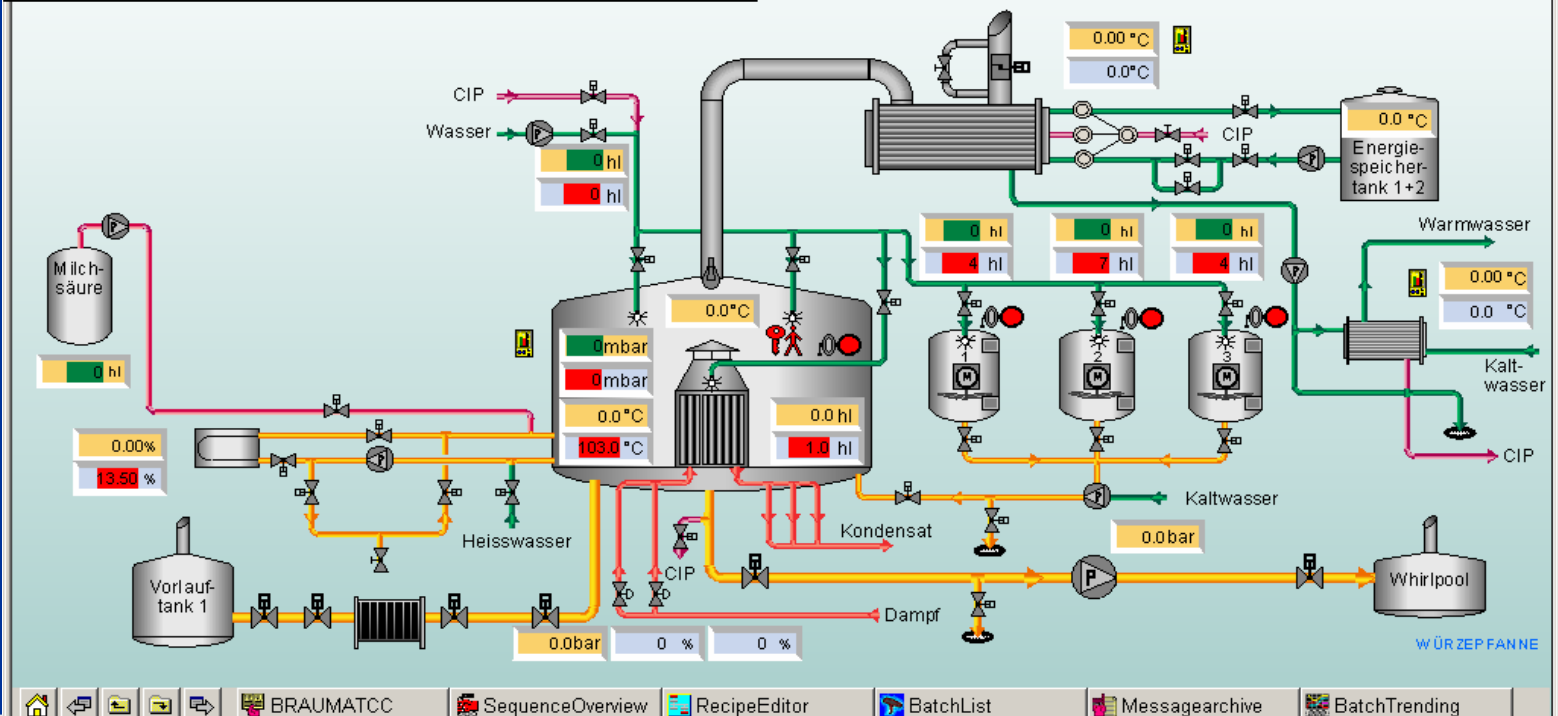
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Process Units

- Lautering
- Mashing
- Fermentation
- Maturation...

- Central and remote Operation
- Dedicated Libraries
- Integration of LIMS
- Alarm logging / Reports
- Openness (OPC)

- Time of “Palmist” is over
- Real Time Information to Management
- Electronic signature & report
- Mobile Panel, SMS, Web Monitoring...





Brewery Overview - Utilities

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Process Units

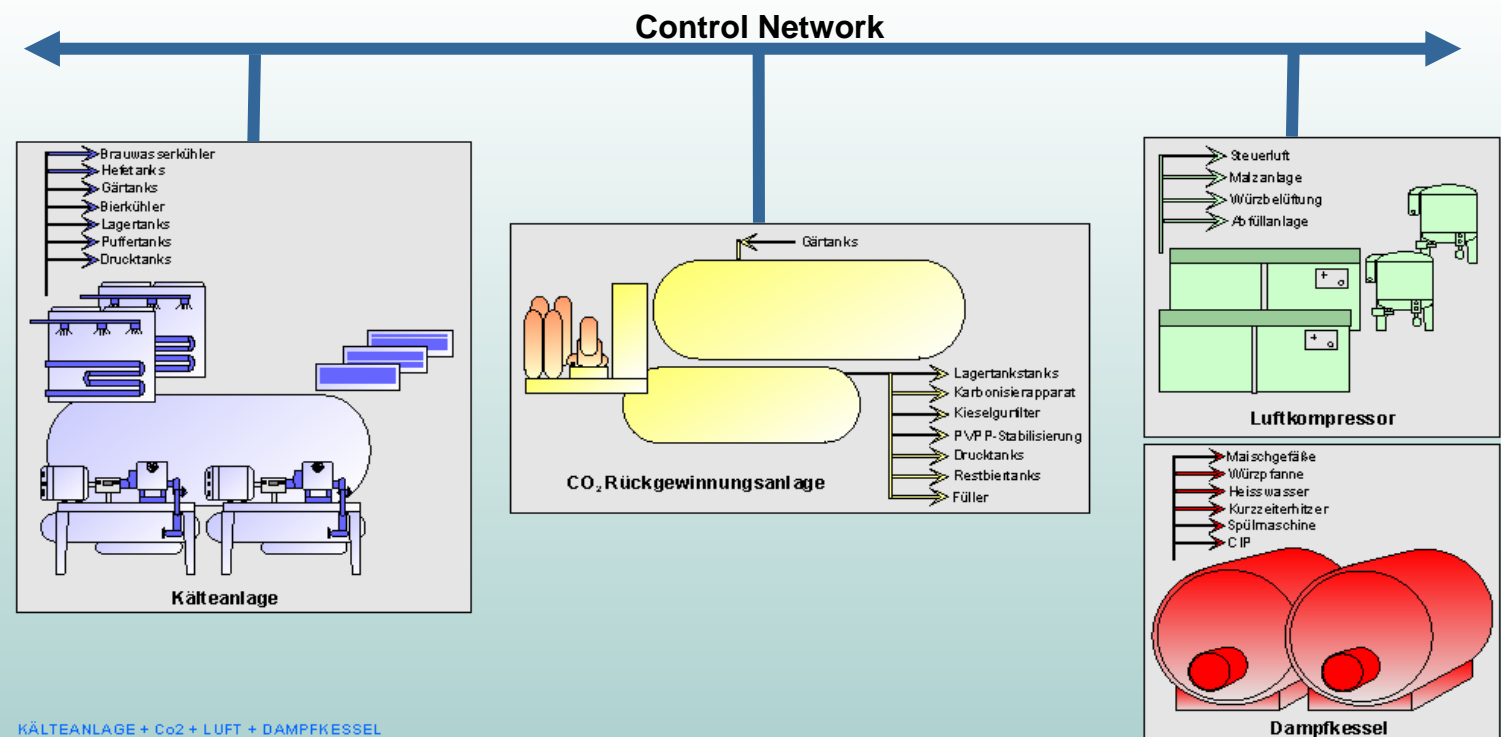
- Compressed Air
- Boiler
- Water Treatment
- Refrigeration...

Packages delivered by OEM's:

- Compressed Air & Boiler
- Water Treatment Plant
- Refrigeration Plant...

Connexion of PLC's improves:

- centralised monitoring
- standardisation of information
- Energy savings



Trends in Automation of Filling & Packaging



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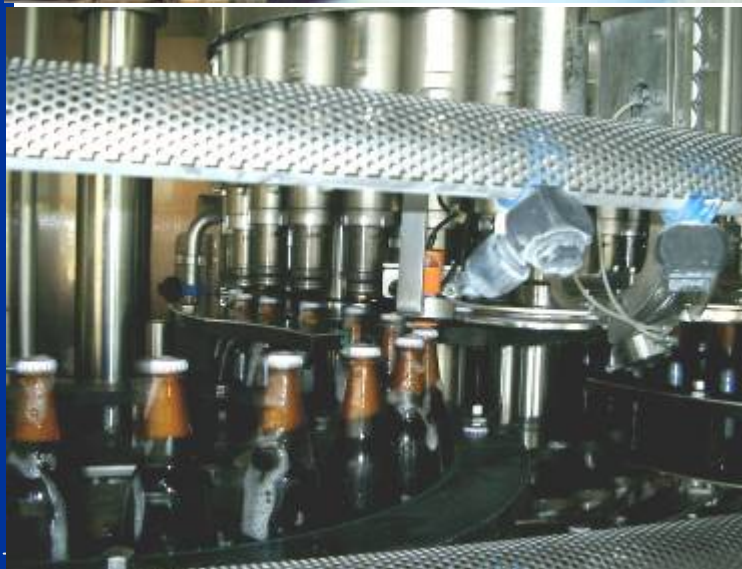
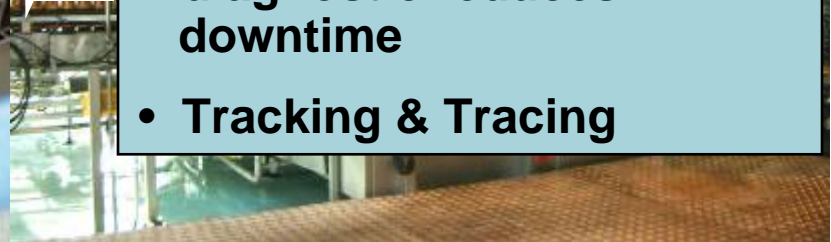
Process Units

- Cleaning
- Filling
- Labelling
- Packaging...

- Packages provided by OEM's
- Smart Switchgears, MCCs, Drives, Weighting Systems on fieldbus



- reduction of installation time and costs: cables, cabinets
- increase Throughput
- diagnostic reduces downtime
- Tracking & Tracing

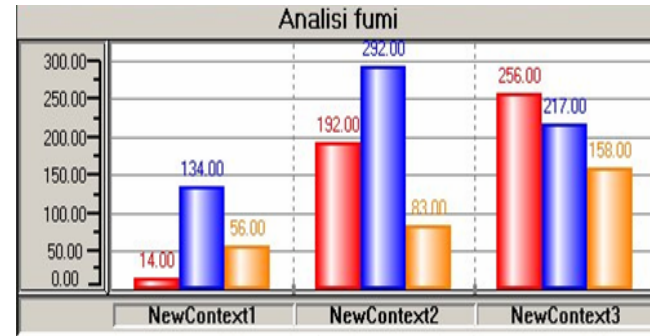




T&T: Management and visibility of KPIs

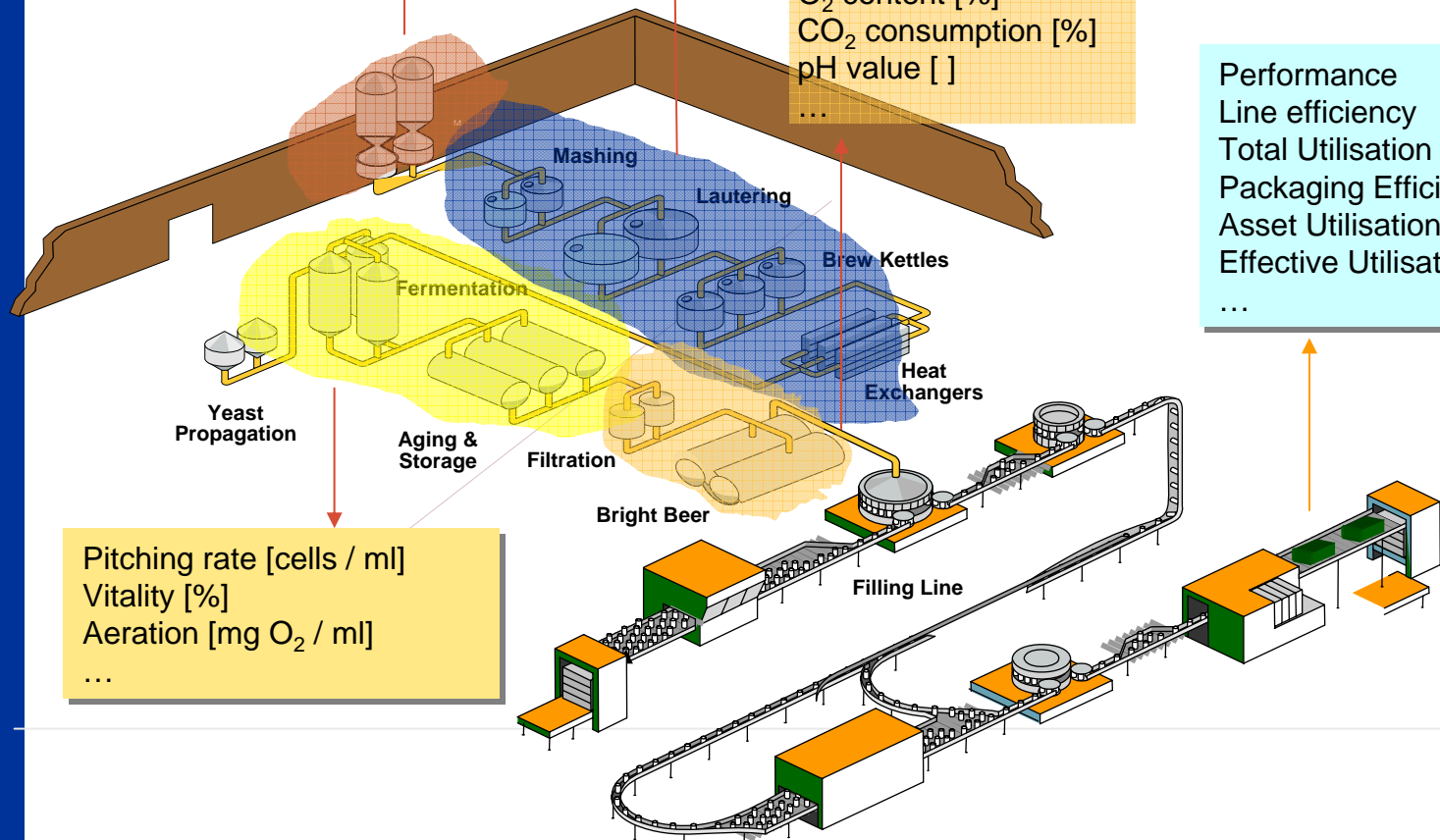
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Milling performance:
 Capacity: [t/h]
 Quantity: [t]
 Grist [%]
 Flour [%]
 ...



O₂ content [%]
 CO₂ consumption [%]
 pH value []
 ...

Performance
 Line efficiency
 Total Utilisation
 Packaging Efficiency
 Asset Utilisation
 Effective Utilisation
 ...



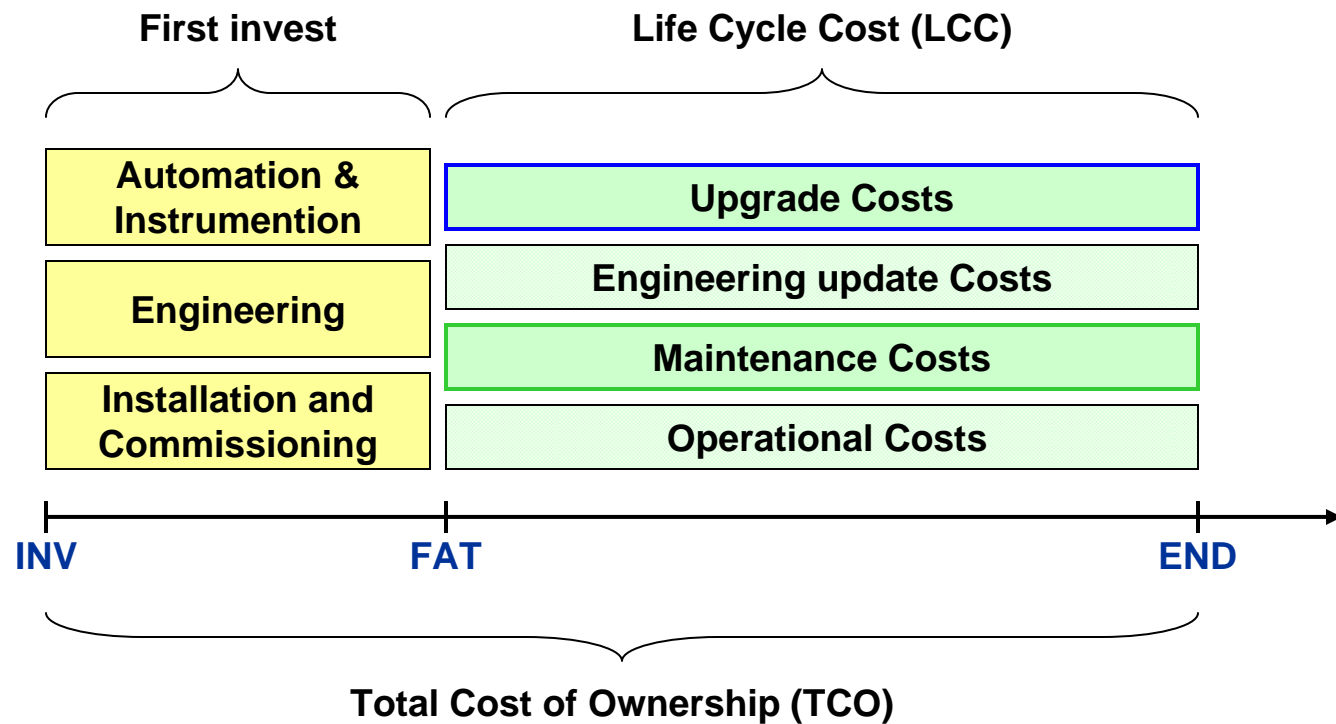
Pitching rate [cells / ml]
 Vitality [%]
 Aeration [mg O₂ / ml]
 ...



TCO (Total Cost of Ownership)

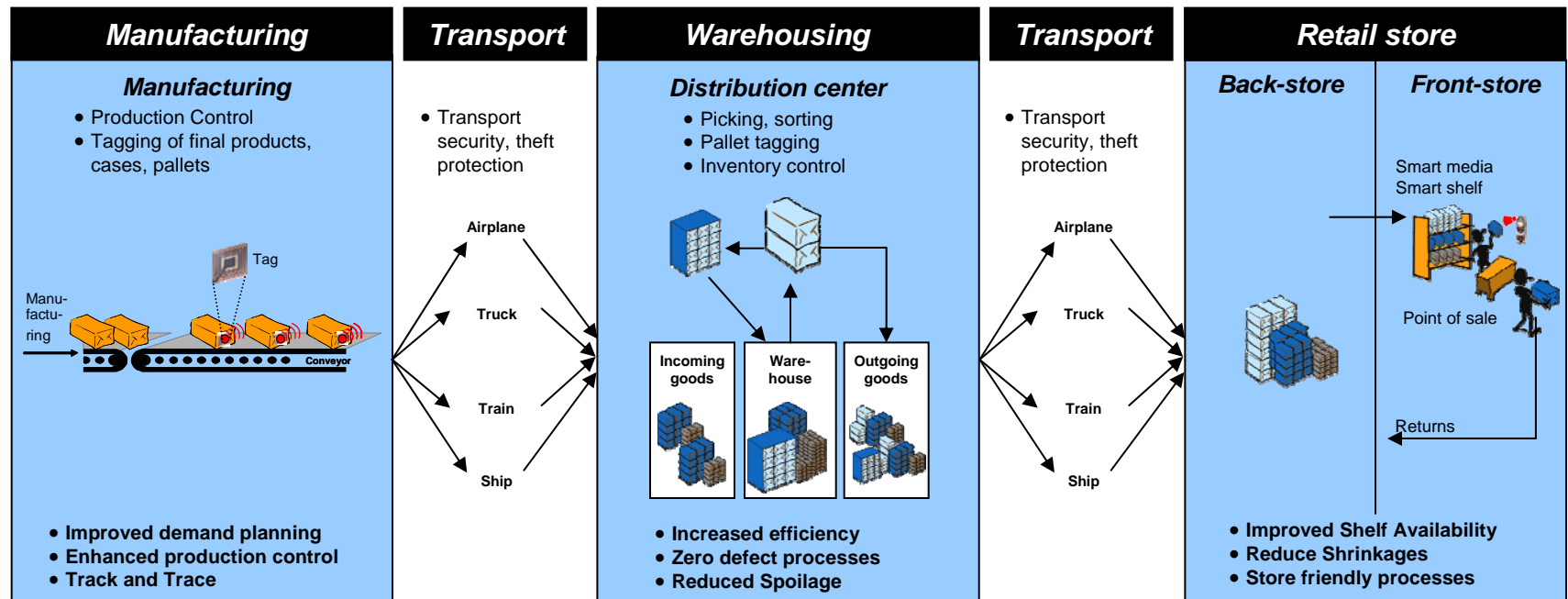
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Consideration of TCO becomes a determinant factor in the choice of a solution



INV = Start Investment
FAT = Factory Acceptance Test
END = End of Plant Life

Market requires responsive Supply Chain RFID serves as trendsetting enabler



RFID Solutions

Increased Productivity / Reduced Assets / Higher Sales Volume

- Automation of raw materials/goods receiving operations
- Automation of warehouse management or fork-lift guidance
- Automated of order picking
- Asset management – internal and external
- Automation of inventory management

- Accurate tracking of products and pallets
- Automated replenishment and inventory management
- Increased warehouse transparency
- Automated communication, checking and guidance



Automation trends in Breweries

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- Challenges become tougher
 - OEM's and Manufacturer anticipate the market and integrate the new technologies in their solutions
 - Affordability of Technology by reduction in price
- “Investment in Automation will lead to readiness to meet future challenges”

Thank you!

Process Technology
From Malt intake to Filling & Packaging

