Agenda

Introduction
- Drivers, Challenges, Trends and Benefits

Data & Use Cases
- Digital Transformation in Food & Beverages
- User Survey Results
- Use Case
- Where are you?

Panel Session
- Q & A
About ARC: Global Advisors to Industry

- Leading analyst team focused on manufacturing ecosystem
- 31 years of thought leadership and market analysis
- 1,500 clients - include end users, suppliers, and financial
- Global advisory, consulting, supplier selection, services, Industry insights in 19 industrial verticals
- Market research, conferences, forums, white papers, newsletters, blogs, and other publications

Delivering value and influence to emerging vendors

www.arcweb.com
Digital Transformation is the transformation of business, industrial products, operations, value chains, and services that are enabled through the augmentation of people and knowledge through the expanded use of digital technologies.
Digital Transformation Challenges
Many Food & Beverage Industry Challenges

**Changing consumer preferences**
- More sustainable
- Product innovation, differentiation

**Food quality concerns**
- Unsafe handling, food-borne illnesses
- Recalls & outbreaks of illnesses
- Regulations

**New worker generation and retiring worker generation**
- Mentoring, training, new technologies
- Retirees knowledge

**Integrated new technologies**
- From raw materials to supply chain
- Secure & customizable digital infrastructure

**Reducing costs – remaining competitive**
- Omni-channels
- More competition
Can Technology Align Culture?

What Cultural Barriers do you have?

People/Culture
Buy-in
Collaboration

Technology
Data/Information Challenges
Integration Challenges
IT/OT Challenges

Business
Perceived Benefits & Visibility
Executive buy-in
Financials

Processes/Things
Real-time complex processes
New equipment/sensors
New ways of doing things
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Requires Working Together!
IT/OT Challenges
Different Mindsets....Different Issues
Challenges
IT/OT Priorities/Cultures Can Differ

We need to run the patch test to see how it affects the process?

Here comes security updates?

Option 1
Separate Manufacturing IT from OT; Wall of Mistrust

Option 2
Train/Embed IT Skills in Automation/Engineering

Option 3
Put Engineering resource under IT Services

Option 4
Put OT resource in engineering
Cultural Challenges

“IT is on their own. Manufacturing may have IT experts, but they are manufacturing people. Manufacturing IT people and IT people don’t see eye to eye.”
What are you doing for the digital transformation?

- **Digital culture readiness**
  - Without a digital culture it's not a digital transformation
  - Nearly 78% of companies that focus on culture sustain performance.
  - By ignoring culture, you risk transformation failure
  - Better financial performance
  - Worker & process enablement is important
    - Job losses - should be addressed

“Culture determines how things get done”
But technology can help drive culture”
Technologies and Business Practices Enables the Digital Transformation of industry

Disruptive Technologies
- Cloud
- Mobile
- Big Data
- Social
- Robotics
- Edge
- Extended Reality
- Predictive Analytics /Machine Learning / AI
- Digital Twins / Simulation
- IIoT
- Extended Reality
- Aging systems, business models and work processes developed for last century

From Farm to Fork
- Connected Supply Chain
- Connected Enterprise
- Connected Operations
- Connected Products
- Connected Services
- Connected Workers
- Empowered
- Synchronized, Collaborative & Autonomous
More Challenges - Technology
IT/OT Technology Challenges
IT/OT Convergence will enable Intelligence (and even more data)

IT/OT Convergence is the integration of information systems with operational technology systems, people & things used to monitor the process, events, trends, devices.
Digital Transformation Challenges
Data Challenges

Data Ingestion
- Connect/integrate data from sensors, systems & other data sources & ingests the data

Cleanse
- Detecting, correcting or removing corrupt/incorrect data e.g. sensor errors, transmission errors, manual issues, time sync errors
- Estimate missing or irregular data
- Adjusting time series, scales

Contextualize
- Data in context & common format
- Data models can separate by equipment, reactor, events, alarms, etc.

Aggregations
- Use algorithms to aggregate & compress data so that still possible to re-produce trends

Data Segmentation, Anonymization
- Segment data e.g. by plants, multi-tenant, joint ventures, 3rd party sharing, etc.
- Encrypt or remove identifiable information for privacy protection
- Reduce risks for data breach

Analytics/Intelligence
- Culture / Data scientists

Data aggregation/cleansing/context

Connectivity & Standards
- New Secure Platforms & scalability
- Data Silos
- Scalability
- Measuring Value

Digital Transformation
- Data Storage
- Data Management
- Data Analysis
- Data Security
- Data Quality
- Data Access
What are some of the Technologies for the Digital Transformation?
What are you doing for the Digital Transformation? (survey)

- Executive team and support for digitization initiatives
- IT/OT teams
- Using technology to enable collaboration

Cultural Evolution

- Data visibility & accessibility
- Contextualizing and combining data
- Connecting/integrating data

Data management

- ML, AI – some roll outs (E.G. shortening batch times, filling lines, custody transfers, etc.)
- Predictive analytics

Advanced analytics

- Replacing legacy systems
- Cloud and edge
- MES
- Historian

New platforms

- Moving data to the cloud, edge, etc.
- Moving historical, reports, regulatory documentation to cloud
- Structured and unstructured

Data lakes, Cloud, Edge

- Replacing repetitive tasks, material movement, filling lines

Robots, chatbots, AGVs, etc.

Visualization

- AR/VR – mostly discrete, maintenance
- CAMERAS/Video EVERYWHERE

Security

- Enhancing cybersecurity technologies and computer access
- Other

About the value!
What are you doing for the Digital Transformation?

- Mobile everything
- New IoT sensors
  - New audio sensors
- Additive manufacturing
- Integrated technologies
  - End-to-End
- Digital twin & simulation
- Track and trace/blockchain
- New processes
- SERVICES/Ecosystems of partnerships/services

About solving the problem and getting value!
Lots of New Digital Devices, Data and Cloud, Edge, On-premise Data Platforms for DT

Data context will become even more important!
New Platforms for the Digital Transformation

• A multi-layer technology that enables the secure provisioning, management, and automation of connected devices within the Internet of Things e.g. remote devices, sensors, data, and applications.

• **IoT platforms** is a cloud platform that collects, configures, manages and maintains data and devices with different layers (including cloud), protocols and network topologies.

**Interoperable**
All types of Analytics
What’s essential?

Value
- Data preparation – ingestion, platform, etc.
- Model and Algorithms – based on use

Model and Algorithms – based on use
- Security
- Scalability

Value
- Analyze and transform their data into value
- Easily make sense of the data
- Observe insights quickly
- Use tools easily

Diagnostic
- Why did it happen?
- Predictive
- What could happen?
- Prescriptive
- What should I do
- Descriptive
- What is happening?

Scalability

Security
What are you doing for Digital Transformation?
Machine Learning and Artificial Intelligence Example

AI – models and applies or imitates intelligence of human minds

- Chatbots - Google assistant, home, mini, AWS Alexa, Dot, Apple’s Siri, Microsoft Cortana rely on DeepMind – AI
- Moving personal profiles or apps from one platform to another?
- 8 million people use voice recognition today

ML is a subset of AI!
AI Example
How many bagels?

• AI Example
  ▪ Facial recognition
How many bagels?

- 8 dogs
- 8 bagels
- Machines are faster
- The algorithm could distinguish the dogs but different breeds are more difficult.
- Tools & Algorithms are getting better and easier to deploy

About Solving Problems!
Digital Transformation
Transformation Brings Value

**People**
- Connecting people for collaboration
- Getting everyone on the same team

**Process**
- Changing processes
- Delivering process intelligence to whomever, wherever, and whenever it is needed

**Things**
- Sensors, machinery, robots and other assets are connected
- IIoT

**Data**
- Connecting and leveraging data
- More autonomous – auto connect
- Connected plant, enterprise
- New data platforms – edge & Cloud

**New Technologies**
- Analytics & AI
- Robotics, Cobots, etc.
- Extended realities

There’s a lot of value in real-time data-based decisions!
What are you doing for the Digital Transformation?
Use Cases...
Deschutes Brewery

- PI system analytics to predict Diacetel rest
- Make better tasting beer
- Reduced production time by up to 72 hours for each batch
- Maximized capacity and postponed $8M in capital upgrades

**BENEFITS**
- Real-time data resulted in better brewing
- 4% decrease in total fermentation time
Where are you in your Digital Transformation Journey?
Food & Beverages Industries Capabilities for Digital Transformation

53% Concerned about their ability to achieve business goals for DT.

Source: RSM
Digital Transformation in the Food & Beverages

81% taking steps to develop DT strategy.
Source: RSM

What are you doing?
Manufacturing and Data Maturity Model for the Digital Transformation

1. COLLECTING DATA
Basic data, many silos, some reporting, spreadsheets...

2. CONNECTING SILOS/ANALYTICS
Connecting silos across plants, standards, practices, new sensors, new technologies.

3. SMART MANUFACTURING
Data is recognized as a key asset. Few data silos. Data alignment. Resources are committed to extracting value from data using advanced analytics. Synchronizing. Robotics, etc. Analytics Multiple plants. Cultural Alignment.

4. FACTORY OF FUTURE
Integrated/automated/autonomous plants across the enterprise.

5. FARM TO FORK
End-to-end complete integration from raw materials to supply chain across plants and enterprise. Autonomous, synchronized, collaboration.

The digital transformation will require new processes, new technologies, new platforms, easier integration, new ways to synchronize & store data sources, new analytics, new jobs, new training, new ways of collaborating & manufacturing for business value.
What are you doing for the Digital Transformation?

...ARC Data in Food & Beverages
Batch Management Software & Services Revenue

Food & Beverages is 3rd largest industry in BMS Market!
MES/MOM by Software & Service Revenue

Food & Beverages is 3rd largest industry in MES/MOM market
Data Platform Software & Services

Food & Beverages is the 5th largest industry in Data Platform Market!
Data Platform/Data Historian Software by Revenue

- OSIsoft is the leading data platform
- 45% of the data platform software revenue
- Integrate and work with other suppliers
Future: Digital Transformation
Future of Industrial Revolution – What’s next?

Industrie 1.0
Mechanization, Steam & water power

Industrie 2.0
Mass production & electricity

Industrie 3.0
Electronics & IT Systems, automation

Industrie 4.0
Cyber-physical systems/networking

Industrie 5.0
Robots, chatbots, sensors physical, biological & chemical = autonomous/synchronized/connected end-to-end – from farm to fork; optimize humans.

Changing culture, services, platforms and architectures.
The Future

New methods, processes for implementing
More collaborative
More connected
More autonomous & synchronous
Connected end-to-end
Even more data!
How do you Get Started?

**01**
START WITH A VISION/TEAM/STRATEGY
Executive support helps align culture, training, etc.

**02**
IDENTIFY & EVALUATE
CHALLENGES/BUSINESS CASE/ACTION
Evaluate challenges/Executive Buy-In/Funding

**03**
PILOT TECHNOLOGY/CHALLENGES
Look for challenges/evaluate for success/measurable – KPIs

**04**
TRANSPARENT/PROMOTE
Make your successes transparent; move from those that don’t work but expect some failures

**05**
SCALE & TRANSFORM & CONTINUE
Scale up and roll out across plants, enterprise; continue process; cybersecurity is still important

How do you Get Started?

- Executive support helps align culture, training, etc.
- Look for challenges/evaluate for success/measurable – KPIs
- Make your successes transparent; move from those that don’t work but expect some failures
- Scale up and roll out across plants, enterprise; continue process; cybersecurity is still important
- Start with a vision/team/strategy
Digital Transformation is Transforming Business

Embrace the digital transformation

Empower people and transform your process!

All about the data and value!
Questions?

Please wait for the **microphone**

State your **name & company**

Please remember

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