Build a Smart Factory through MES Best Practices

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MES/WMS Product Management

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Process Manufacturing & Distribution Software

Agenda

- Introduction
- Smart Factory
- Key - Best Practices
- Lean Improvement
- Where to Start
- Datacor MES/WMS Strategy & Partnerships

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Introduction & Background

- 25+ Years in Manufacturing
- ½ Career in a Corporate role & ½ Career in Software/Services
- Digital Stream Leader – Build out of Largest Pea Protein Plant in the World – Roquette Manitoba
- Facilitated & Coached over 50 Kaizen Improvement Events Leveraging TPS Lean Concepts & MES Data
- Implemented over 20 MES solutions worldwide
- MIT Certified in 'Smart Manufacturing'
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Steve Pombert
Datacor MES/WMS
Product Manager

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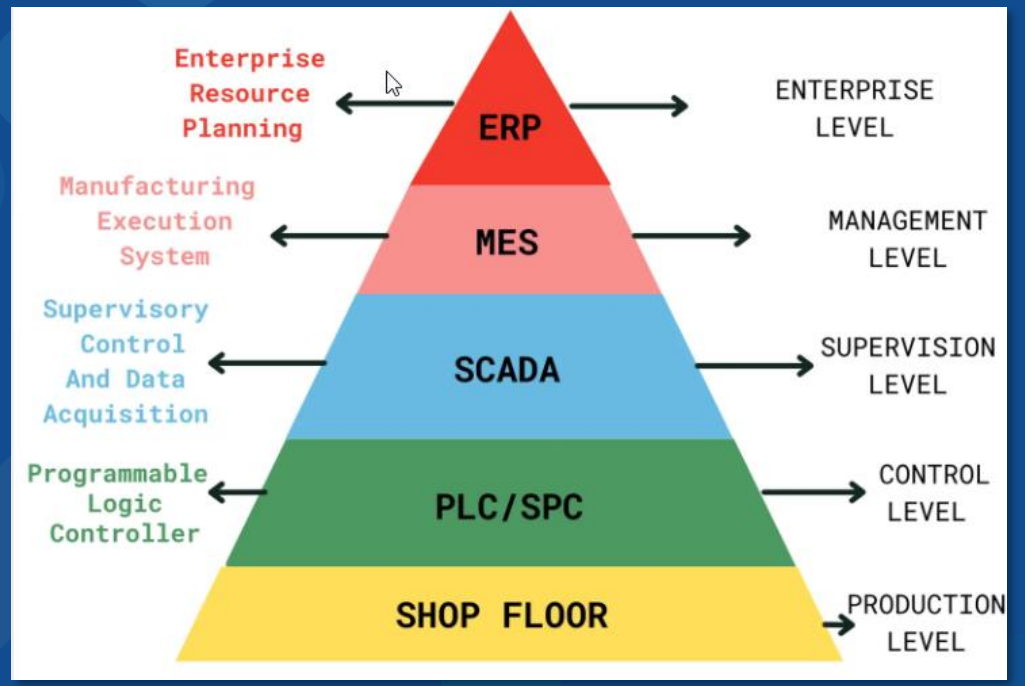
Smart Factory



What is a Smart Factory?

A smart factory is a digitized manufacturing facility that uses connected devices, machinery and production systems to continuously collect and share data. This data is then used to inform decisions to improve processes as well as address any issues that may arise.

Smart Factor – Four Levels

There are four levels that can be used to assess your journey through the improvement process to becoming a smart manufacturer:

1 Basic Data Availability

There is data available, but it is not easily accessed or analyzed. Data analysis, where it is done, is time consuming and can add inefficiencies to your production process.

2 Proactive Data Analysis

At this level, the data can be accessed in a more structured and understandable form. The data will be centrally available and organized with visualization and displays assisting with its processing.

3 Active Data

At this level, the data can be analyzed with the assistance of machine learning and artificial intelligence, creating insight without as much human supervision. The system is more automated than at level two and can predict key issues or anomalies to proactively predict potential failures.

4 Action-Oriented Data

The fourth level builds on the active nature of level three to create solutions to issues and, in some instances, undertake action to alleviate a problem or improve a process with no human intervention.

Smart Factory – OEE & 6 Big Losses

- **OEE = Availability x Performance x Quality**
- **Availability (Uptime vs Downtime)**
  - Time the line produced product vs. total time
  - Equation: (Uptime) / (Total Available Time)
  - Available Time = Time that the cell had a Shift was turned on minus any Planned Downtime.
- **Performance (Speed)**
  - Rate of production, while the line is actually running.
  - Equation: (QtyIn) / (Uptime * Planned Rate)
- **Quality (In vs out)**
  - Good product vs. total produced product
  - Equation: (QtyOut) / (QtyIn)

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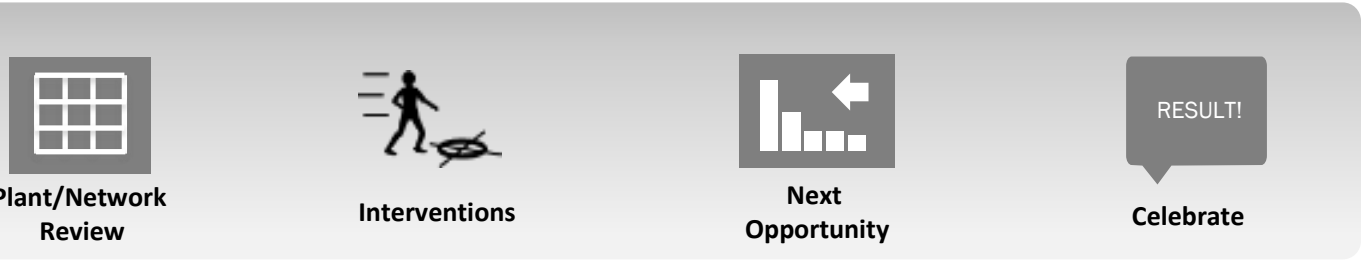
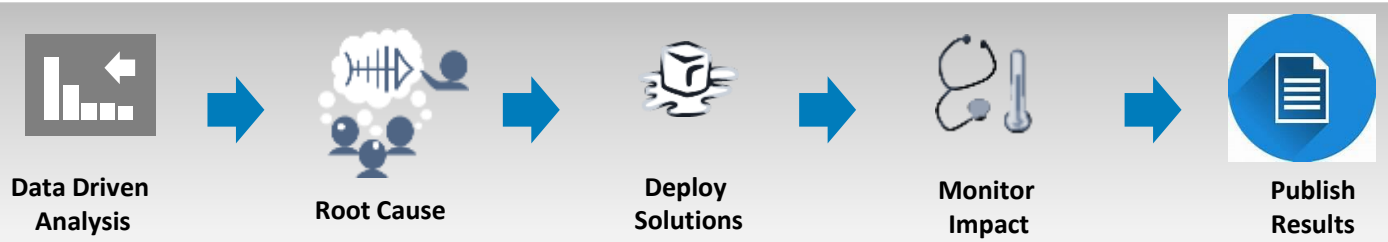
Key – Best Practices

Key – Best Practices

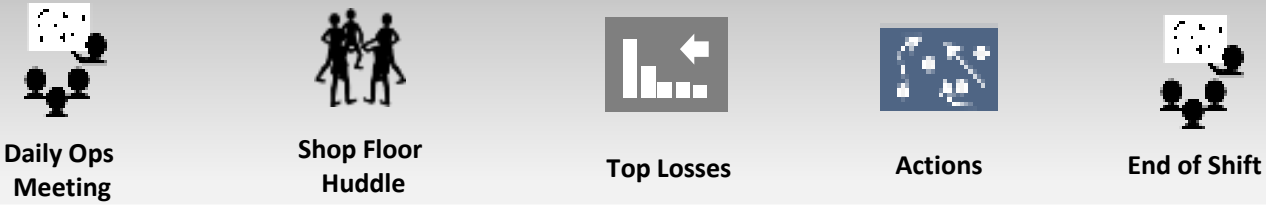
EXECUTIVE ENGAGEMENT



IMPROVEMENT CULTURE



CONSISTENT DAILY ROUTINES



HOW WE DOING

Lean Improvement

Lean Improvement

- Business Objectives to improve upon
- What data are you evaluating?
- Do you have defined KPI's
- Paper to Digital – Data to Information
- 8 Wastes
- 5S, Standardized Work
- Transparency

Lean Improvement –Case Studies

Base Line *Industry* Metrics

- Average OEE Baseline 54%

Smart Factory Findings Year 1

- OEE uplift of 12%

By digitizing it's processes and going paperless, The Lewis Chemical Company quickly found it was not only simple to manage and monitor production, but fewer manual errors were creeping into the system. It no longer had to rely on paper transfer sheets and batch tickets, and with real-time inventory updates it was also far easier to monitor and manage the movement of product from its warehouse to production.

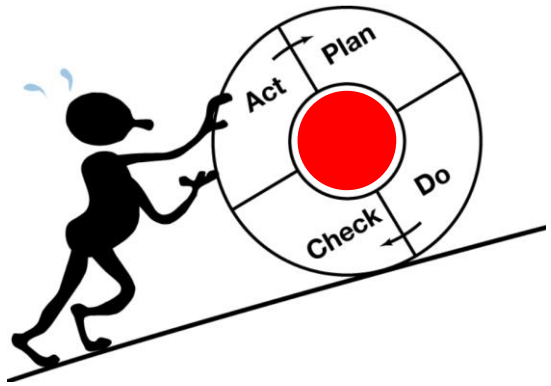
Lizzie Eisenhart, of Deveraux Specialties, says the decision to adopt the WMS and MES was an easy one.

> **"Since we implemented the MES/WMS in April, we've actually saved more money in terms of inventory than we've spent on Datacor's software."**

> **"While we'd previously been running at around 89% inventory accuracy, since implementation of Datacor's software we are now running above 98% on our spot checks.**
>
> Zack Raiford

Where to Start

Where to Start – People / Data / Machine



Capabilities:

- Internal Assessment
- SWOT Analysis
- Goals / Money

Strategy (PLAN):

- Phase definition
- Team identification
- Communication Plan

Implementation (DO):

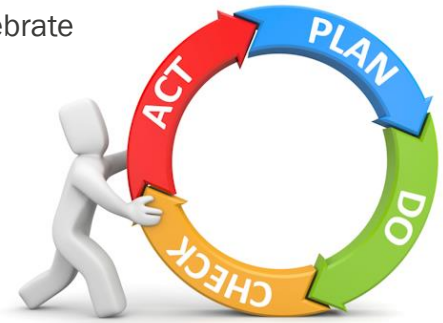
- Communication
- Execution
- Training
- Change Management

Analysis (CHECK):

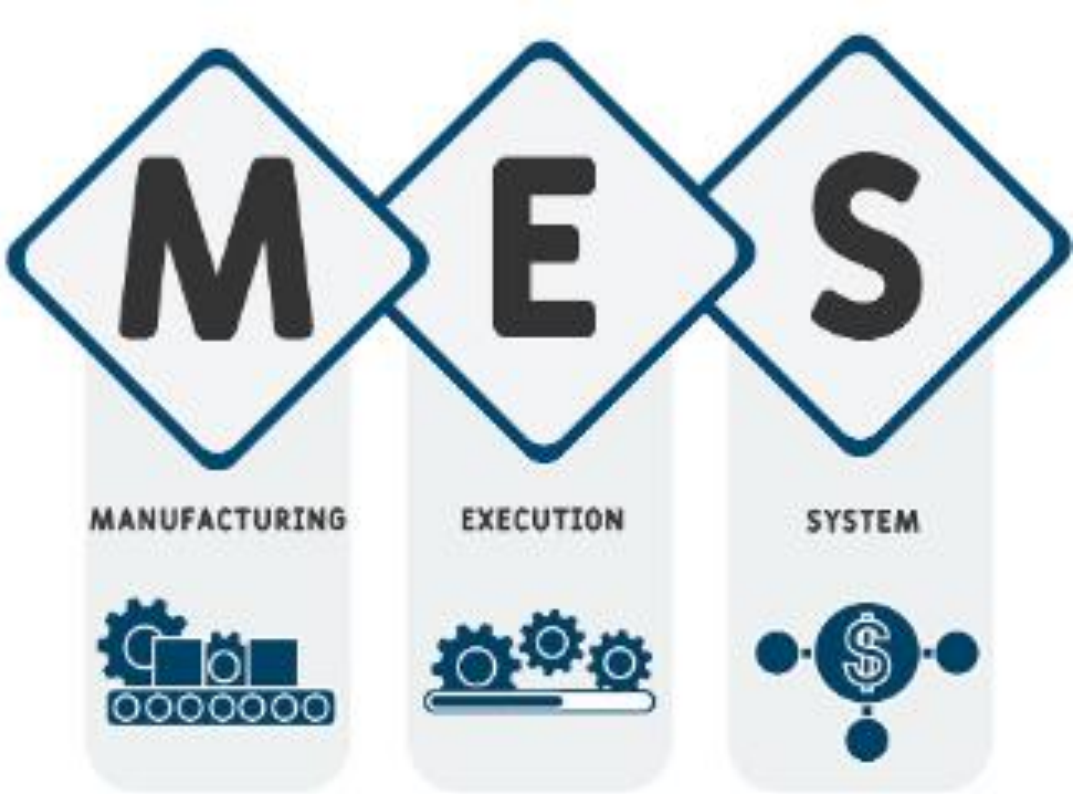
- Use the DATA
- Improve the DATA
- Focus on Real Time Improvements
- Consistency

Improve (ACT):

- Teams
- Use all resources
- Test
- Measure
- Celebrate



Selecting a MES



Objective Considerations

- Align with Business Objectives
- Inventory Management
- Performance Management
- Real Time
- Mobility
- Transparency
- Price

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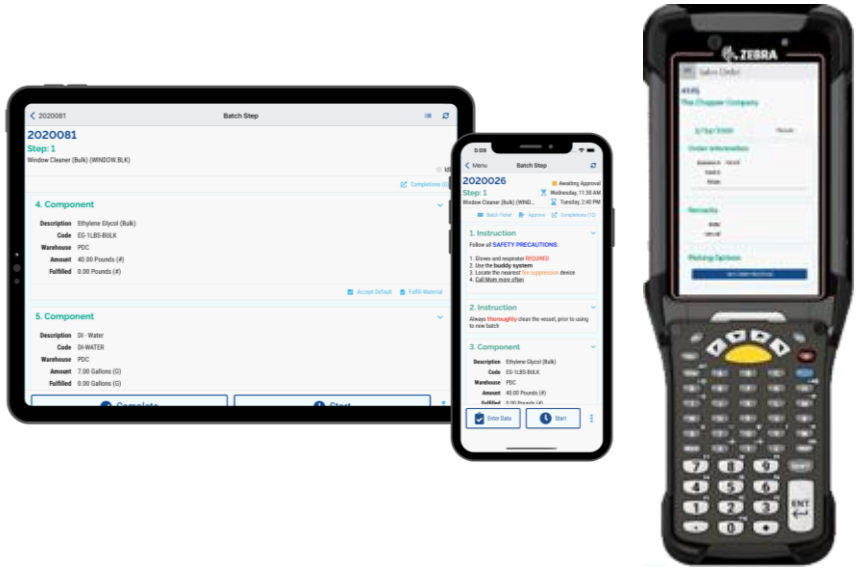
Datacor - MES/WMS

Mobile Digital Production System – MES/WMS

Primary Strategy



Mobility with Tablets & Scan Devices	• Eliminate paper on the production floor
Inventory Management	• Accurate and timely inventory management
Performance Management	• Improved production performance through real-time visibility and metrics
Mitigate Risk	• Product & Location Validations / Barcoding

Positive Business Outcomes

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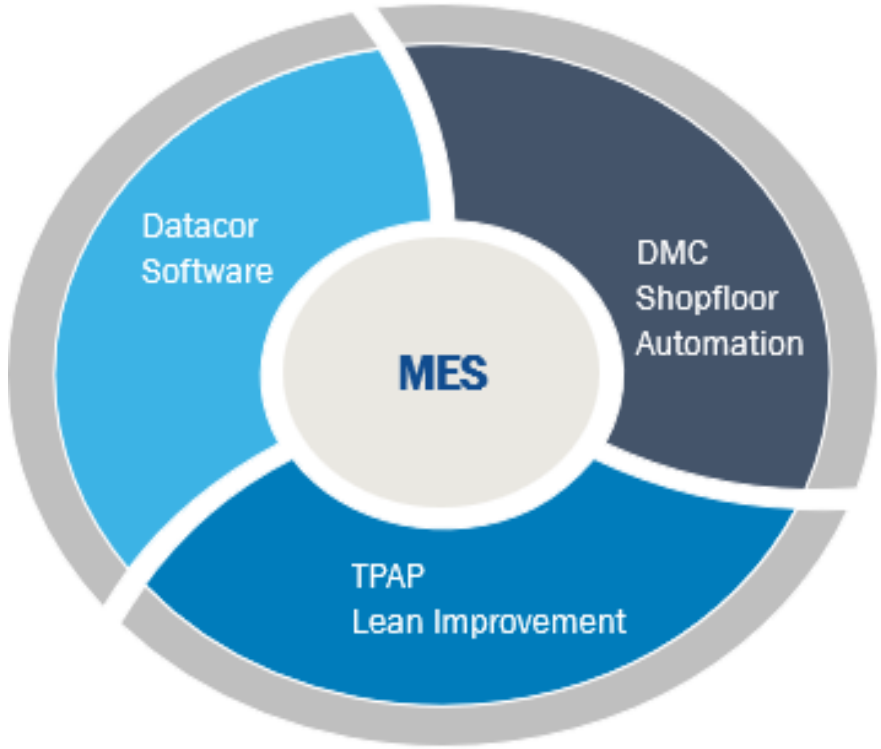
Summary – Value & Benefits

- **Inventory Management Improvements**
  - Real-Time Updates & Mitigate Risk
  - Supporting Best Practices
- **Connected Workforce**
  - Clear Communication
  - Skills uplift with technology
- **Plant Production Visibility**
  - Up to date Production and Warehouse information
  - Timely decision making
- **Lean Journey**
  - Starting down the Lean Performance Path
  - Data Based Process Improvement

Partnerships



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Thank You