



Moving at the Speed of Manufacturing

Connecting the Intelligence of Machines, People, and Software

Agenda

- Where I Started
- What the Factory Already Knows
- Removing Barriers
- Turning Information into Action
- Building a Factory That Learns



Career Path

2011 - 2013

BELLEVUE COLLEGE

- Med School Prerequisites





2016 - 2022

Simplot

- Food Scientist

2013 - 2016

BOISE STATE

- Research: Neurobiology and Neuropsychology





2022 - 2026

Keurig DrPepper™

- Sr. QA Manager



2005 - 2011

North Coast
A Sonepar Company

- Warehouse Manager

2013 - 2016



- Microbiology Laboratory Technician





Current State vs. End State: What Must Change?

Preparing an Optimized Factory

Current State

- Inputs are repetitive
- Data is fragmented
- Noisy visual management
- Knowledge held by individuals
- Learning is unidirectional

End State

- Automation
- Integration
- Clear signals
- Institutional memory
- Learning is bidirectional

Three Overlapping Systems

- Machines
  - PLCs, HMIs, sensors, alarms, parameters, fault codes, errors, machine states
- People
  - Operations, quality, maintenance, processes, notes, radios, evaluation, investigation, conversation, communication
- Software
  - MES, ERP, QMS, historians, dashboards, emails, forms, spreadsheets





What the Factory Already Knows



Integration and Automation

- Reduce the number of systems
- Build seamless workflows
- Never ask an operator for something a machine already knows
- Reduce input fields, clicks, tabs, and windows
- Elicit feedback and design for operators



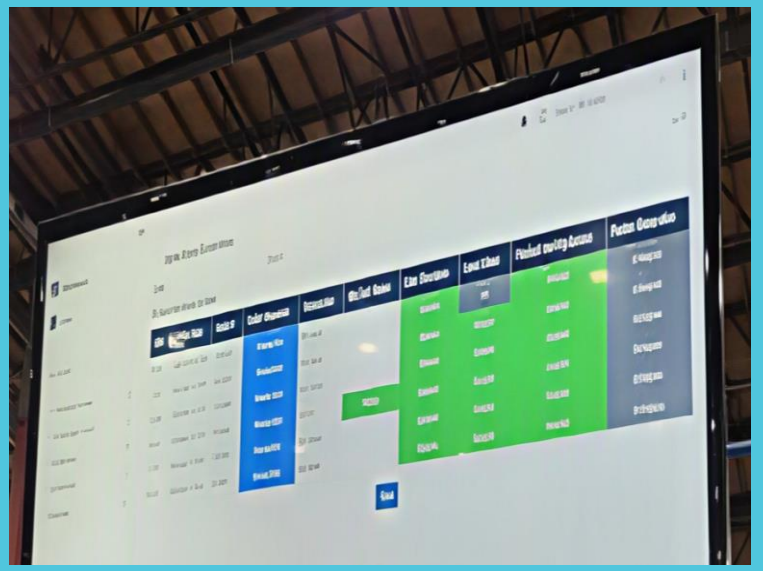
Removing Barriers



Shift Cognitive Load

- Compliance is a function of ease
- Attention is limited
- Interpretation
- Judgment
- Anomaly recognition
- Problem-solving and improvement









Visual Management & Signaling

Attention Drives Action

- Real-Time
- Simplified
- Actionable
- Accessible
- Targeted











The Operator as a Sensor

- Data is never the whole story
- Those closest to the problems are closest to the solutions
- Operators sit at the nexus of activity
- Build operator capability through training, education, and understanding

Build and Leverage Institutional Memory



Key Challenges

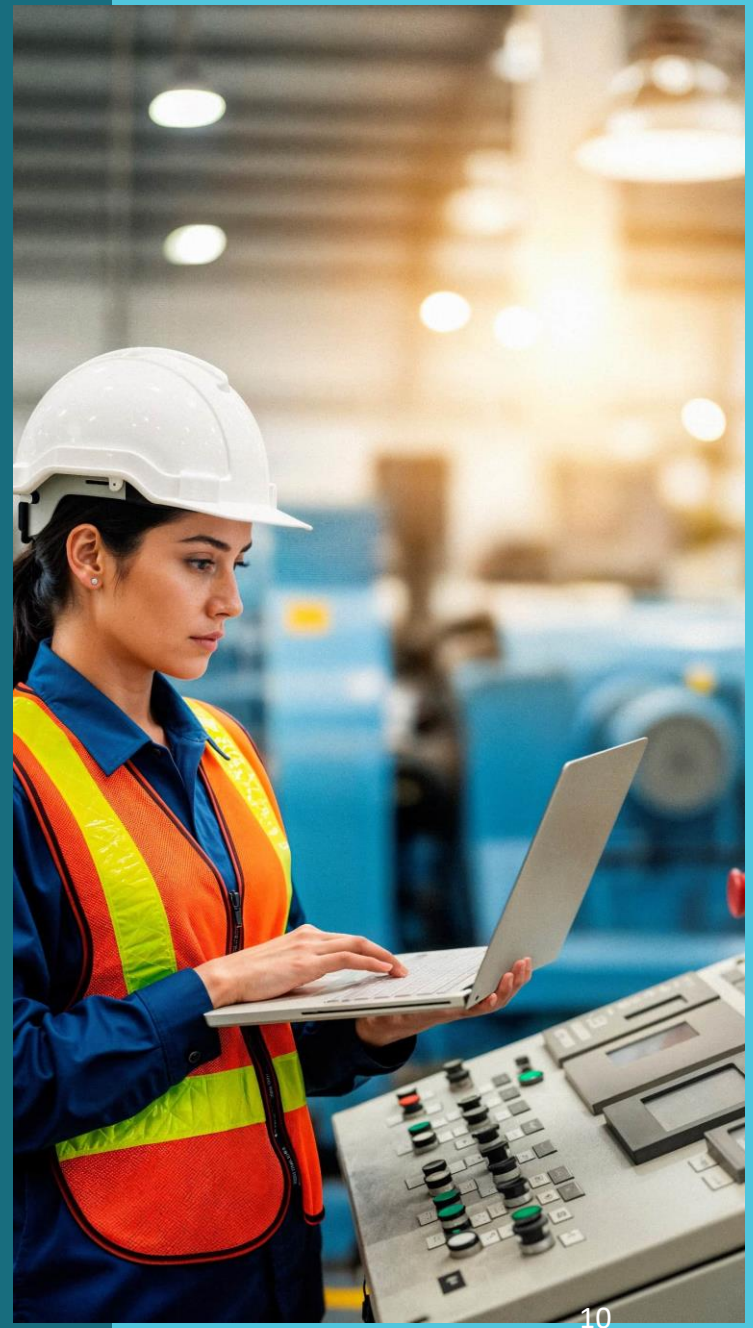
- Knowledge and experience vary across people and shifts
- Operational memory decays, even in high-performing systems
- Solutions are better documented than diagnostic reasoning
- Applying solutions without learning weakens operational maturity

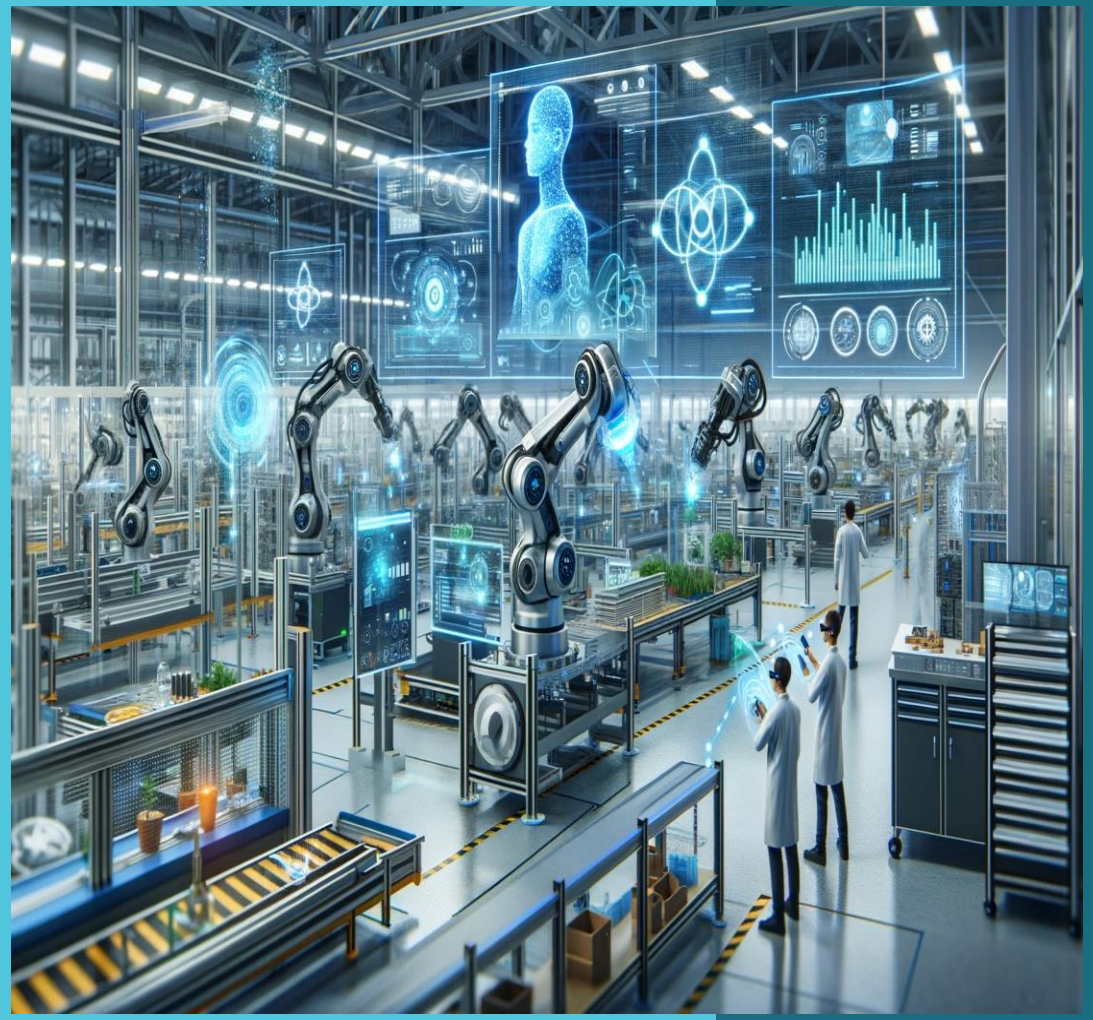




Bidirectional Intelligence

- The system learns from people
  - Capture relevant operational communications in real time
- People learn from the system
  - Use captured diagnostic reasoning as a training tool
- The system analyzes and informs
- People prioritize and drive decisions





A Factory That Learns

Moving at the speed of manufacturing means connecting machines, people, and software into a continuously refining system. It simplifies inputs, removes unnecessary barriers, turns real-time information into action, and learns faster than it forgets.