Brilliant Manufacturing from GE Digital:

Manufacturing Execution and Performance Management Solution for Conveyor and Assembly Operations

Manufacturing, made brilliant

The Industrial Internet of Things (IIoT) is bringing about a convergence of global industrial systems with the power of advanced computing, analytics, low-cost sensing, and new levels of connectivity. At the same time, today's highly competitive and ever-changing manufacturing environment requires operational agility like never before.

Conveyor and assembly manufacturing environments must support faster, more varied product development, minimize warranty and recall exposure, and reduce risk while improving throughput and efficiency. Manufacturers must constantly balance production speed to reduce missed delivery penalties and ensure product safety and quality. These demands require rapid response to changing conditions in production activities across the factory and supply chain, making the use of manufacturing intelligence, analytics, and control imperative to drive performance improvements.

GE Digital's Brilliant Manufacturing software meshes the digital world with the physical world of manufacturing to deliver holistic performance management for today's connected enterprise. Leveraging the power of the Industrial Internet, Brilliant Manufacturing connects your machines, production data, and people for an unprecedented level of information visibility and manufacturing insight. This holds the potential to bring about profound transformation, better known as digital industrial transformation.

Built on an industrial-strength platform, Brilliant Manufacturing is a powerful Manufacturing Execution and Performance Management solution that's proven to help reduce costs, improve quality, and speed production—optimizing your manufacturing performance from the plant floor to the enterprise for the agility you need to stay ahead of competition.

The Power of 1%

Leveraging the power of the Industrial Internet, numerous small improvements at scale—such as 1% reduced downtime on critical equipment—drive big changes in operating margin.
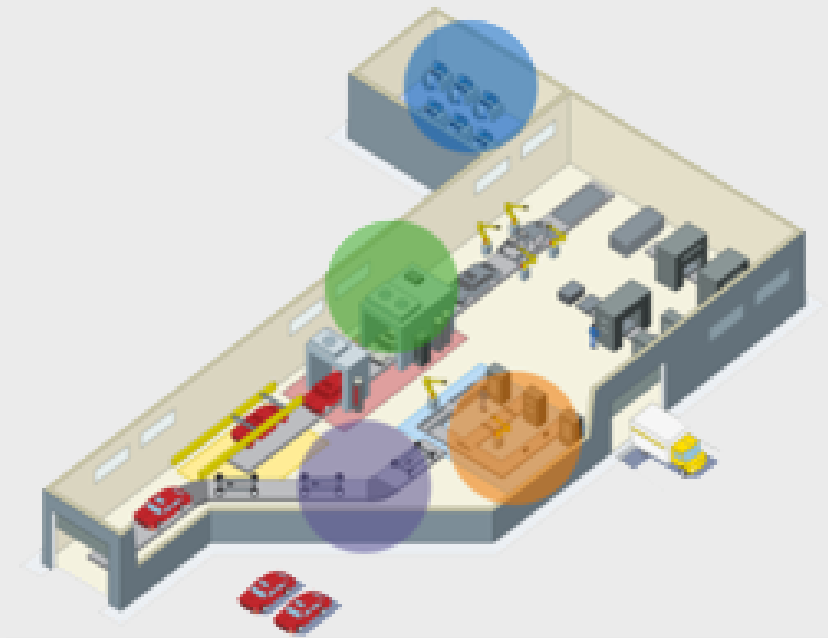
Speed production

- **Optimize scheduling**
  Improve on-time delivery performance and respond optimally and with agility to late stage changes. Optimize scheduling by leveraging plant floor finite capacity scheduling for executing orders and performing "what if" scenarios.

- **Optimum materials management**
  Gain up-to-date visibility of all work-in-process orders. Act with agility to ensure that you keep your promise to your customer.

- **Centralize sequencing and intelligent routing**
  Get more successful new product introductions (NPIs) and shorten design-to-delivery cycles. Create product definition for the products controlled, including execution and nested bill of materials required.

- **Faster real-time order execution**
  Efficiently release and execute orders obtained

from enterprise systems. Communicate critical information, such as order status and material consumption, and manage production disruptions—allowing other enterprise systems to understand the status of orders as well as actual production costs.

- **Manufacturing instructions**
  Enable operators with information such as workflow-based process steps and instruction documents as jobs are executed. Minimize paperwork to optimize personnel performance.

Improve quality

- **Genealogy and traceability**
  Capture a robust set of information, including the material or lot consumed in the production, all quality data, routes, operations, documents, and quality forms used in production, non-conformances, and related traceability information. Synchronize with ERP and provide data for product recalls and to support regulatory compliance.

- **Quality built in and digitized error proofing**
  Support right first-time performance by capturing operational steps and quality data associated with the product or process automatically in real-time or manually. Perform analysis on process-oriented data and product-oriented data as quality data is being captured.

- **Non-conformance management**
  Classify material as non-conforming when captured quality data indicates out-of-spec tolerances, and initiate a non-conformance process such as product quarantine and updated recall instructions.

Operational Excellence—bringing together machines, data, insights, and people for holistic performance management.

- **Qualification and certification management**
  Support regulatory compliance with flexible configuration of the qualifications and/or certification levels of equipment and personnel to ensure the right people and/or equipment are performing operations.
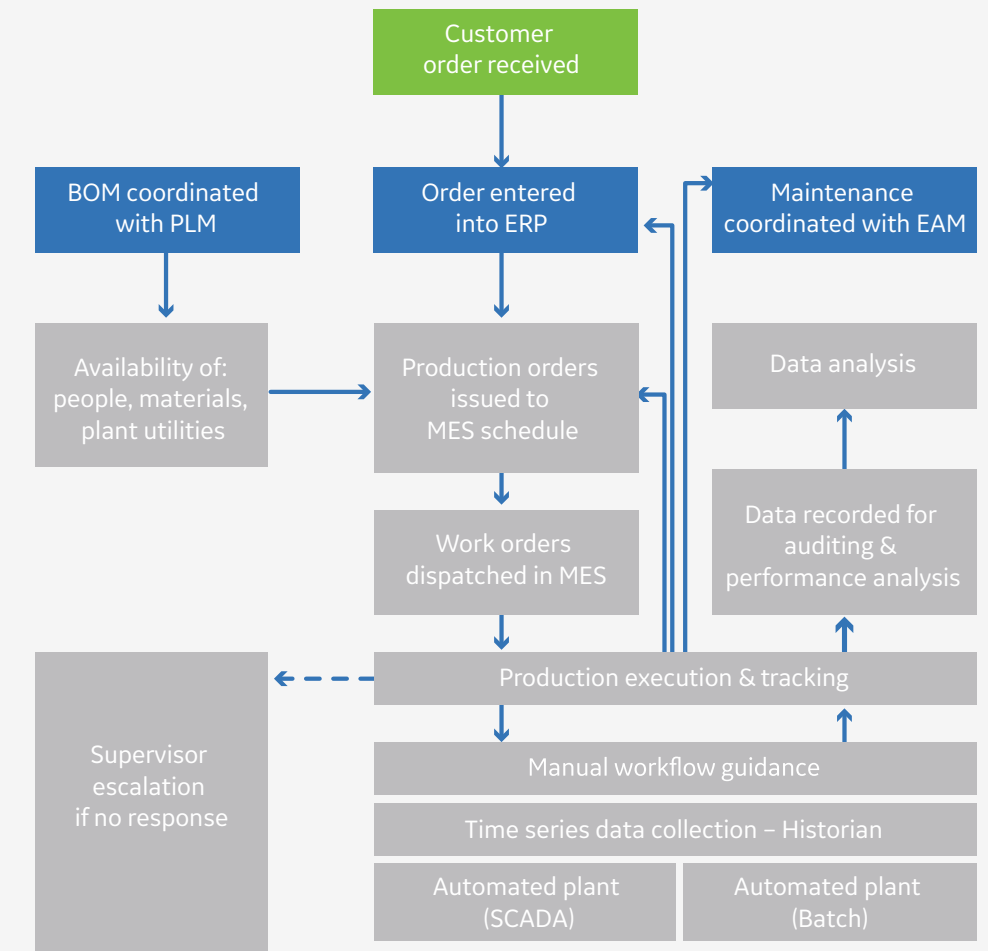
Reduce costs

- **Resources management**
  Model equipment, personnel, and materials in the production environment, and ensure availability for a planned production sequence—reducing costly production gaps by coordinating the entire resource-management process and providing real-time visibility into inventory levels.

- **Energy management**
  Reduce energy costs, identify sources of energy and utility waste, and drive energy management best practices. Understand the true correlation between energy costs and manufacturing production.

- **Efficiency management**
  Gain insight into the factors that cause manufacturing productivity losses and act on critical process parameters related to throughput and quality. Act in real-time to critical indicators such as overall equipment effectiveness (OEE) and target zero downtime.

Digitization approach — Leverage our proven digital industrial approach for Operational Excellence, which incorporates Advisory Services, Implementation Services, and open technologies to enable incremental improvements—starting with process visibility for quick wins and scaling up to enterprise-wide integration for a long-term competitive edge.

Improve asset performance — Gain real-time insight into machine condition and reliability while improving maintenance productivity through intelligent asset strategies that help optimize performance, make operations safer, and ensure a lower sustainable cost

Work process management — Ensure your best practices become standard operating procedures with work process management solutions, which electronically manage your work and empower your changing workforce. Ensure consistency and the provision of audit trails for compliance—reducing errors and costs.

Advanced analytics — Utilize cutting-edge technologies and techniques to extract knowledge from existing historical process and manufacturing plant data, and incorporate that knowledge into real-time actionable information processes in a manner easily consumed by shop-floor operations. It's the power of industrial big data at work.

- Customer order received
- BOM coordinated with PLM
- Order entered into ERP
- Maintenance coordinated with EAM
- Availability of: people, materials, plant utilities
- Production orders issued to MES schedule
- Data analysis
- Work orders dispatched in MES
- Data recorded for auditing & performance analysis
- Supervisor escalation if no response
- Production execution & tracking
- Manual workflow guidance
- Time series data collection – Historian
- Automated plant (SCADA)
- Automated plant (Batch)

About GE

GE (NYSE: GE) is the world's Digital Industrial Company, transforming industry with software-defined machines and solutions that are connected, responsive, and predictive. GE is organized around a global exchange of knowledge, the "GE Store," through which each business shares and accesses the same technology, markets, structure, and intellect. Each invention further fuels innovation and application across our industrial sectors. With people, services, technology and scale, GE delivers better outcomes for customers by speaking the language of industry.

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