

Proficiency* for Manufacturing

Speed production, improve quality and reduce costs

Powerful MES for Manufacturers

The Industrial Internet 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.

Manufacturers are pressed to rapidly respond to changing conditions for

production activities across the factory and supply chain, making the use of manufacturing intelligence to drive performance improvement a business imperative.

GE Intelligent Platforms' Proficiency* for Manufacturing Hybrid (PfMH) software meshes the digital world with the world of manufacturing to deliver holistic performance management for today's connected world. Leveraging the power of the Industrial Internet, PfMH connects your machines, data and people for

an unprecedented level of information visibility and manufacturing insight and holds the potential to bring about profound transformation.

Built on an industrial-strength service oriented architecture (SOA) platform, PfMH is a powerful MES solution that's proven to help reduce costs, improve quality, and speed production. It can help optimize your manufacturing performance from the plant floor to the enterprise—delivering the agility you need to stay ahead of your competition.



Speed Production

- 1. Optimized Order Scheduling**
Improve On-Time Completed Shipments (OTCS) 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.
- 2. Optimum WIP Management**
Gain up-to-date visibility of all work-in-process orders for product lines and/or production areas. Act with agility to ensure that you keep your promise to your customer.
- 3. Centralized Product Management**
Enable more successful New Product Introductions (NPI's) and shorten design-to-delivery cycles. Deliver product definitions for the products controlled, including recipes and/or nested bill of materials required.
- 4. 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.
- 5. Manufacturing Instructions**
Enable operators with information such as workflow-based process steps and/or instruction documents as jobs are executed. Eliminate paperwork where appropriate to optimize personnel performance.

Improve Quality

- 6. Genealogy and Traceability**
Capture a robust set of information, including the material/BOMs consumed in the production, all quality data, routes /operations / documents /quality forms used in the production, non-conformances, and related traceability information. Synchronize with ERP and provide data for product recalls and to support regulatory compliance.
- 7. Quality Built in**
Support Right First Time performance by capturing quality data associated with the product and/or process automatically in real time or manually. Perform analysis on process-oriented data and product-oriented data as quality data is being captured.

- 8. 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 rework instructions.
- 9. 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 is allowed to perform the operations.

Reduce Costs

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

- 11. 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.
- 12. Efficiency Management**
Gain insight into all the factors that cause manufacturing productivity losses, and act on critical process parameters related to throughput and quality. Act in real time based on critical indicators such as Overall Equipment Effectiveness (OEE) and target "zero downtime."

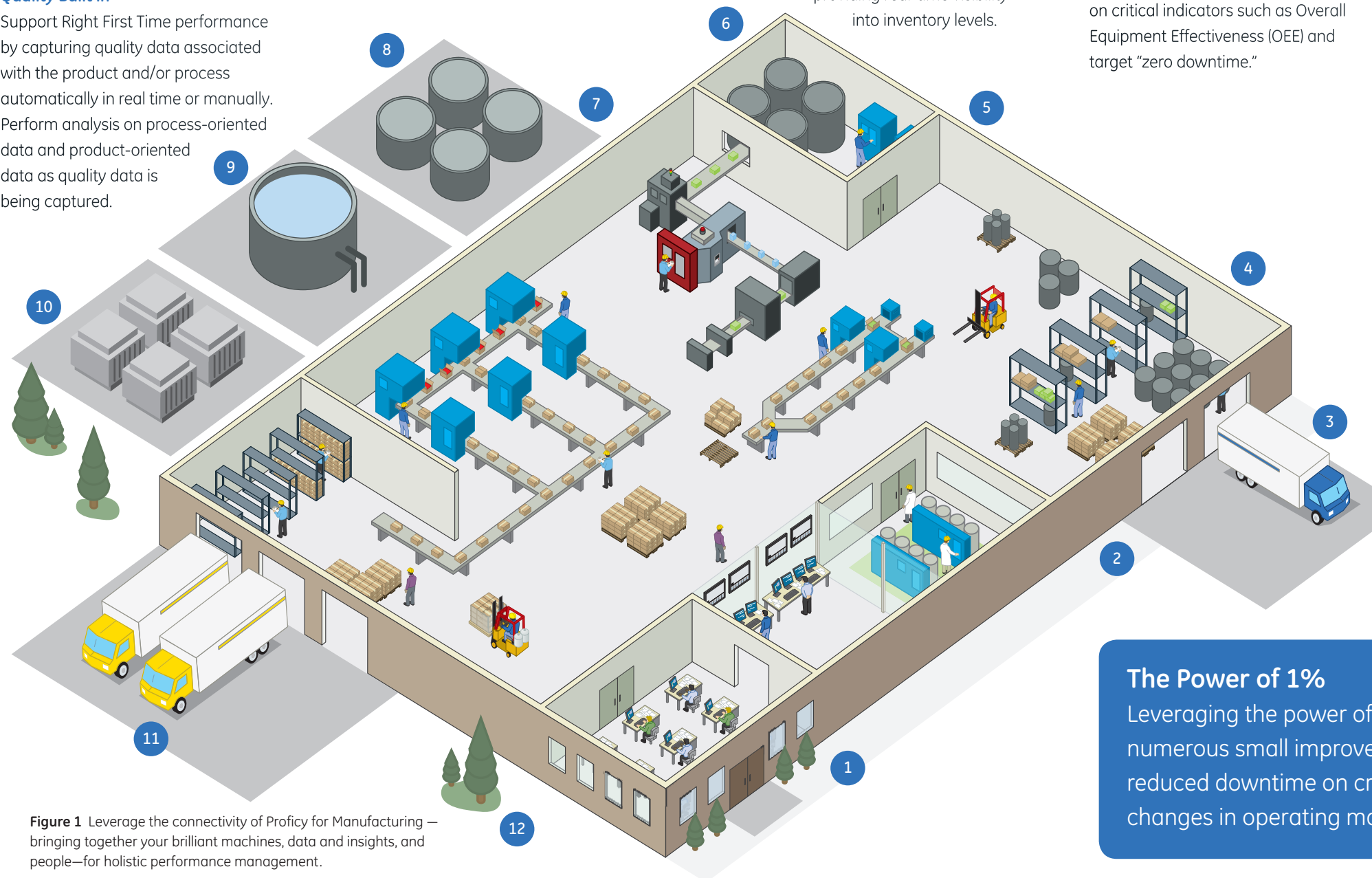


Figure 1 Leverage the connectivity of Proficiency for Manufacturing — bringing together your brilliant machines, data and insights, and people—for holistic performance management.

Accelerate Your Competitiveness with GE's Unique Offerings

Operational Excellence – Leverage our proven approach for Operational Excellence, which uses open technologies and enables incremental improvements—starting with process visibility for quick wins and scaling up to enterprise-wide integration for a long-term competitive edge.

Manufacturing Sustainability – Gain real-time insight into machine and facility energy consumption, enable a deeper understanding into the interdependencies between performance and energy usage, and leverage advanced analytics for critical decision support.

Work process management – Ensure your best practices become standard operating procedures with our work process management solutions, which electronically manages your work processes and empowers your workforce. It enables consistency and the provision of audit trails for compliance—reducing errors and costs.

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

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.

Business and Plant Floor Connectivity - Powered by the Industrial Internet

PfMH integrates your business systems at the ERP level with the control systems on your plant floor, which facilitates the collection, tracking and reporting of manufacturing intelligence and bi-directional communication. It's the power of brilliant machines at work.

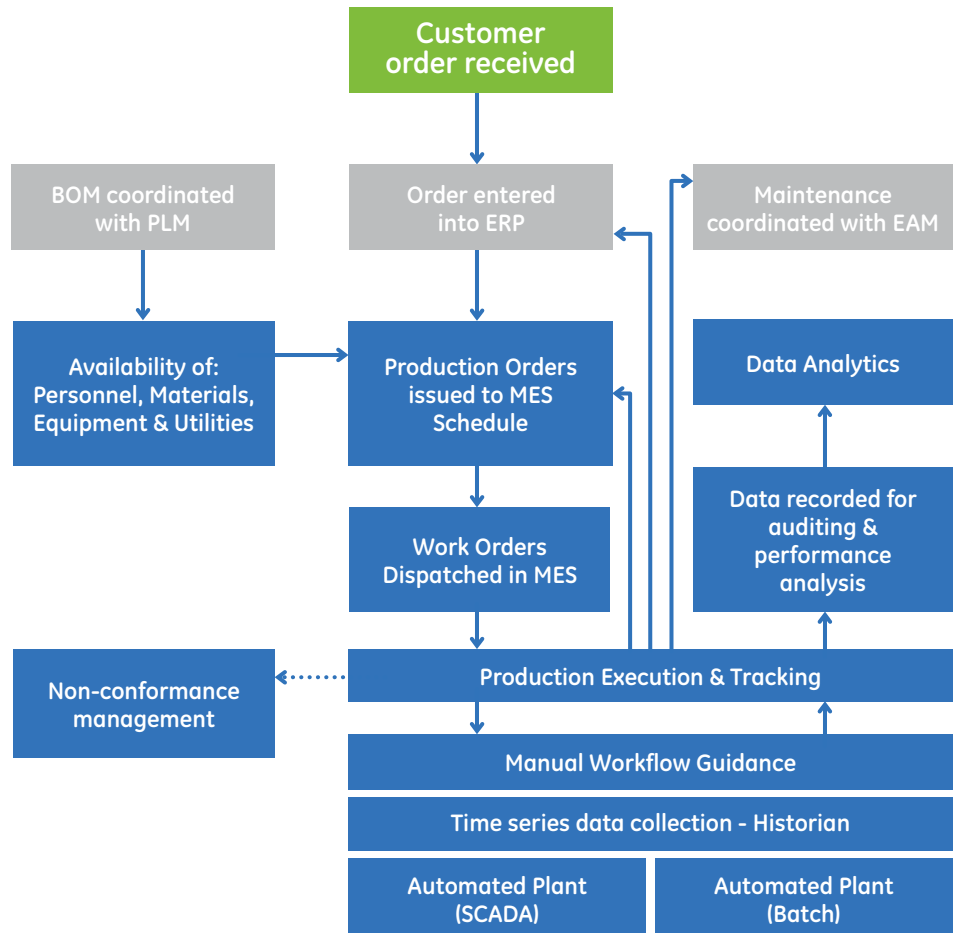
With PfMH, you can manage, monitor, and synchronize the execution of real-time, physical processes (automated or manual) involved in transforming raw materials into intermediate and/or finished goods. It coordinates this execution of work orders with enterprise systems such as enterprise resource planning (ERP), product life cycle management (PLM) and enterprise asset management (EAM) systems. Furthermore, PfMH provides feedback on process performance and supports component and material-level traceability, genealogy, and integration with process history.

Through the use of B2MML and ISA 95 data models, our solution provides a standards-based approach for connecting to ERP systems—delivering Industrial Internet-enabled connectivity that drives holistic performance management.

Deliver results that matter

With more than 100 years in manufacturing, more than 500 GE

Proficy* Manufacturing – A Day in the Life



manufacturing sites globally, and more than 400,000 Proficy software installations globally, GE understands your challenges and business needs.

You can rely on our deep industry expertise, which is built into PfMH with industry best practice templates, to optimize your manufacturing.

Let us help you deliver results that matter: lower costs, improved quality, greater operational agility and speed, and increased profitability.

Learn more at www.ge-ip.com/mes

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