



Let's Solve

POV

Is MES still relevant in an IIoT world?

Raman Kartik Iyer | Head - Delivery, IoT Practice, LTI



A Larsen & Toubro
Group Company

Is MES still relevant in an IIoT world?



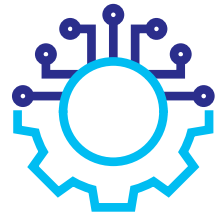
In today's competitive markets having a lean manufacturing process is critical. Sharing information between the manufacturing shop floor and business systems can help manufacturers build a connected enterprise and bring in efficiency by enabling seamless data flow between systems. The Industry 4.0, is transforming manufacturing by leveraging sensors, connected equipment in manufacturing facilities, and is giving manufacturers the opportunity to enhance operations with better data and process integration.

However, with rapid adoption of Industry 4.0 there are several questions that bother manufacturers beginning their Smart Manufacturing journey. Some of the more common ones are:

- ▶ Will an IIoT platform replace the Manufacturing Execution System (MES) we have in our plant?
- ▶ Should we select an IIoT platform or an off-the-shelf MES solution for some specific functions of manufacturing?
- ▶ Can an IIoT platform deployment also deliver MES functionalities?

Manufacturing enterprises are always working at optimizing production processes and developing efficient, innovative services, and both MES and IIoT applications have a lot to offer manufacturers in this space. MES platforms can be enhanced to deliver multiple times their current benefits by leveraging IIoT's power of data analysis that spans internal boundaries. An IIoT platform connects systems and functions previously walled off, including supply chain, operations, personnel, after sales and maintenance help build a true digital and transparent manufacturing enterprise.

Why MES is still very relevant

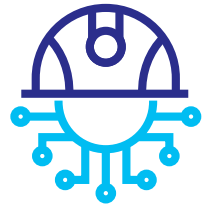


Enterprises need to better leverage their existing MES investments, check for overlapping features between the MES and IIoT platform, and evaluate the benefits of implementation of an IIoT platform at a plant level. An MES solution plays a critical role in Smart Manufacturing journey because the process data stored in MES helps provide “context to data” acquired from other sources including sensors.

MES helps better plan and manage manufacturing processes on the production floor. It provides production support to shop floor operators guiding them through the production process and giving real time visibility helping production leaders to take quick and informed decisions. It acts as the middleware between the ERP and the plant automation layer and helps with the execution of work orders and provides real-time visibility into plant operations. The speed of transaction on both the sides of the MES layer is different and it helps bridge the two worlds. The operational process knowledge automated into MES solutions will be difficult to replicate in IIoT platform based solution. If complex workflows, interoperability, regulated environment, are requirements on shop floor, then MES will continue to play a pivotal role for example in life sciences, automotive and aerospace industry verticals.

Now let’s try to address the manufacturer’s concern and understand how an IIoT platform could complement the existing MES solution.

How IIoT helps manufacturers



An IIoT platform aggregates data from all the plant level systems, stores it securely, and prepares it for data analysis that will yield insights. The types of data stored are process data, equipment condition, maintenance, plant layout information, quality related, data from plant level historian, data from sensors installed on the shop floor, equipment condition monitoring, environment parameter monitoring, energy management, in-process quality monitoring and so on.

In addition to managing all this data, an IIoT platform performs several other functions such as:

- ▶ Interaction with edge gateways and sensors to acquire data in a secure way and support different industrial connectivity protocols
- ▶ Data acquisition and storage of data for historical data analysis
- ▶ Real-time visualization, processing and analysis of data
- ▶ Data analytics for insights and report generation
- ▶ Management of end-points - sensor and gateway device management
- ▶ Process workflows and application based on business problems/ use cases

An IIoT platform also provides various tools that can be used for workflow orchestration based on end-user persona and area of interest. For example, a process engineer can look at the deviations in process parameters, and based on the time interval that the thresholds were breached, can look at equipment condition data for identifying the root cause. IIoT platforms are being used for production monitoring, quality and inventory management.

Why IIoT and MES need each other

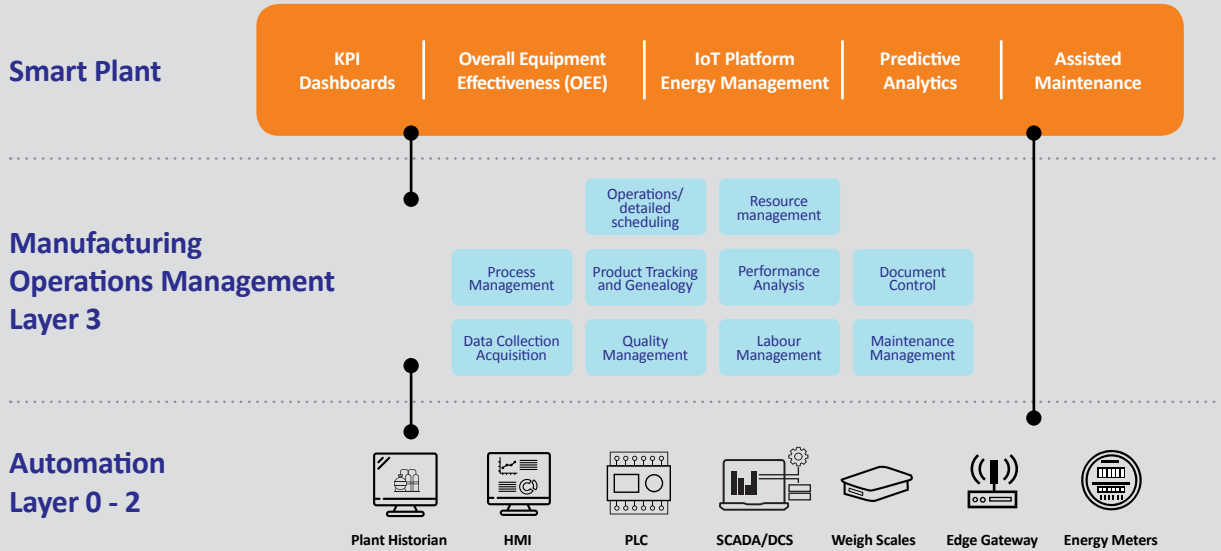
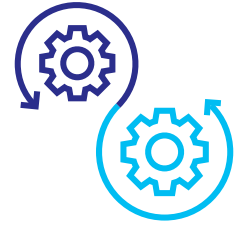


For Smart Manufacturing to be successful, it is critical that disparate systems on the shop floor deployed over time are consolidated into a standard MES package following ISA 95 data hierarchy and a global template for processes. Deploying this solution in individual plants might require plant level customization, albeit minimal. This standardization helps lower maintenance costs and allows for periodic upgrades that might be available from the vendor.

Unlike an IIoT platform, MES holds the transition information which can be used to correlate the production events with the data received by the IIoT platform to derive insights. This way, the IIoT platform when integrated with an MES system provides solutions to specific business problems on the shop floor. For example, for a leading discrete manufacturer, the drop in Overall Equipment Effectiveness (OEE) for a work center was because of a high number of bad parts being used in production. An immediate drilldown of machine parameters revealed that the head frequency had dropped at the polishing work center and that was the reason for parts getting rejected during the quality check. Once the machine data was captured in the IIoT platform, correlating process data with equipment condition data helped in quick localization of problem areas on the production line.

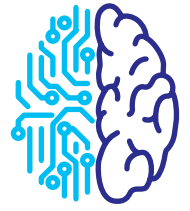
Implementation of new use cases leveraging an IIoT platform is much faster, because of standard templates and solution components available as part of the platform. For development of a use case, it is required to define the workflow and orchestrate the solution.

Why IIoT and MES need each other



In the absence of an IIoT platform, we have seen instances where besides serving the classical functions of MES, the system has been enhanced for IoT uses cases. Some of the common use cases are energy management, condition monitoring, etc.

Smart Manufacturing in the future = MES + IIoT platform



In the future, MES and IIoT platform will co-exist and will be integrated to provide an ecosystem that is scalable vertically in terms of new use cases and horizontally across production lines and plants. Having an MES platform on the shop floor is a first step in the manufacturing transformation journey because MES is a vital source of data for implementing Smart Manufacturing use cases.

The concept of an 'MES Lite' solution using an IIoT platform is being considered by some plant managers for few of the manufacturing functional areas. Such a solution will provide visibility into various KPIs like OEE, energy efficiency, etc. and can address the gap where a comprehensive MES solution is not economical viable.

Commercial Off-The-Shelf (COTS) MES packages are also evolving and becoming open architecture-based, making it easier to integrate with other systems and introduce new features.



Raman Kartik Iyer

Head – Delivery, IoT Practice, LTI

Kartik heads the global delivery for IoT Practice across industry verticals. In this role, he is responsible for delivery of IoT transformation program for global customers. He has over 20 years of experience and has played sales, program and delivery management roles in different geographies. His areas of expertise include product design, industrial automation and Industry 4.0. He has helped multiple customers define and navigate their digital transformation journey by bringing in solutions on IT-OT convergence, factory visibility, condition monitoring, predictive maintenance, digital twins for process & asset, and digital thread.

LTI (NSE: LTI, BSE: 540005) is a global technology consulting and digital solutions company helping more than 420 clients succeed in a converging world. With operations in 30 countries, we go the extra mile for our clients and accelerate their digital transformation with LTI's Mosaic platform enabling their mobile, social, analytics, IoT and cloud journeys. Founded in 1997 as a subsidiary of Larsen & Toubro Limited, our unique heritage gives us unrivaled real-world expertise to solve the most complex challenges of enterprises across all industries. Each day, our team of more than 30,000+ LTItes enable our clients to improve the effectiveness of their business and technology operations, and deliver value to their customers, employees and shareholders. Find more at www.Lntinfotech.com or follow us at [@LTI_Global](https://twitter.com/LTI_Global)