Manufacturing Trends and the MES Connection

BY LUIGI DE BERNARDINI | TUE APR 21 2015

When referencing big manufacturing trends these days—those trends that evolve rapidly and have a significant impact on changing operations where they are applied—we are often referring to one of four key technologies: the Internet of Things, Big Data, Cloud Computing or Analytics.

The Internet of Things is a concept wherein devices communicate their status, needs and problems using intelligent sensors to transmit this information over the Internet. Widely distributed sensors and data sources are woven into an autonomous communications network, generating complex and significant aggregated data.

Big Data identifies the large volumes of data available at high transfer speeds and is characterized by innovative and economic systems that are needed to manage and extract information useful in decision-making. The challenge is storing and processing these data efficiently.

This combination of technologies within a production management system has the potential to create a vision of the production environment that goes beyond the boundaries of the plant to pervade the entire supply chain from raw material to final customer.

Cloud Computing usually refers to a system whose processing capabilities are provided through Internet technology and is scalable, so that the user does not have to acquire and maintain an IT infrastructure, but can simply use a service sized dynamically to suit their needs. Information is available anywhere and to anyone who needs it.

Analytics is a generic term to identify activities and business intelligence applications relating to a specific domain or specific content. Analytics involve the application of statistical models or mathematical algorithms to the available data in order to predict possible scenarios and support manual or automated decision-making processes. This facilitates the ability to treat data in a complex way, automatically applying algorithms to generate sophisticated information previously available only after extensive manual processing by people with extensive experience.

Each of these technology elements have been generated within IT, but they are not considered closely related or interdependent. However, I believe that there is a different way to look at it. These four trends, each one transformative in and of itself, are, in fact, complementary parts of an overriding movement that is revolutionizing the manufacturing industry.

The combination of all four key pieces outlines a scenario identifiable as the evolution of a single manufacturing execution system (MES) to a new level of pervasiveness and efficiency.

This combination of technologies within a production management system has the potential to create a vision of the production environment that goes beyond the boundaries of the plant to pervade the entire supply chain from raw material to final customer. With real time information available on both the basic components and the finished product, the data generated is of unimaginable value. Production processes can transform themselves constantly, adapting to the market conditions to optimize production times, reduce waste, maximize inventory turns, improve efficiency and, ultimately, ensure the satisfaction of the customer.

The ability to include information collected directly from the finished product in real time adds a whole new dimension to analysis. The end user is the recipient of all the added value of such a production process. Implementation not only requires a reorganization of production processes, with its technological investments, but induces a cultural change related to the fact that each link in the chain cannot independently determine its own strategy. Each link needs to align its strategy with those of the other elements and must behave as one component in the full transformation of the entire system. The alternative is that the chain may end up broken, and your company pulled out of the market.

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