ITC INFOTECH

Business-friendly Solutions

MANUFACTURING EXECUTION SYSTEM

BUILDING BLOCK OF A FUTURE READY FACTORY

Manufacturing industries across the globe have leveraged technology over the years to meet customer expectations, out-perform competition, simplify operations and build new products and services, resulting in enhanced stakeholder confidence. With technologies evolving at a rapid pace, and numerous **Industry 4.0** tools available for adoption, building the right 'digital transformation roadmap' is critical to the success of the digitalization journey. Some of the questions on the mind of every CIO envisaging a digital transformation for their organization are - where to start, which technologies to adopt first, and which business or manufacturing process to begin with. And these are the questions that this article attempts to answer while presenting a real-world approach on starting a Digital Factory journey.

Across the globe, manufacturing industry has made at least some progress in the last decade on adopting better technology in their manufacturing processes. This has led to improvement in efficiency and productivity, as well as cost reduction. A few countries and sectors have been early adopters of new technology and have reaped benefits of their decision, while others have moved up the curve by a few notches, if not more. To the extent that this technology can create value for the organization and can justify the investment, these companies are implementing the newer technologies. Technology implementation in the past has been more opportunistic and customer-driven, without being clearly guided by a well-defined strategy or a roadmap at large! A digital transformation roadmap, considering the technological requirements, interdependencies and constraints, as well as linkages to business challenges and goals will help organizations maximize return on their investments.

FUTURE READY FACTORY

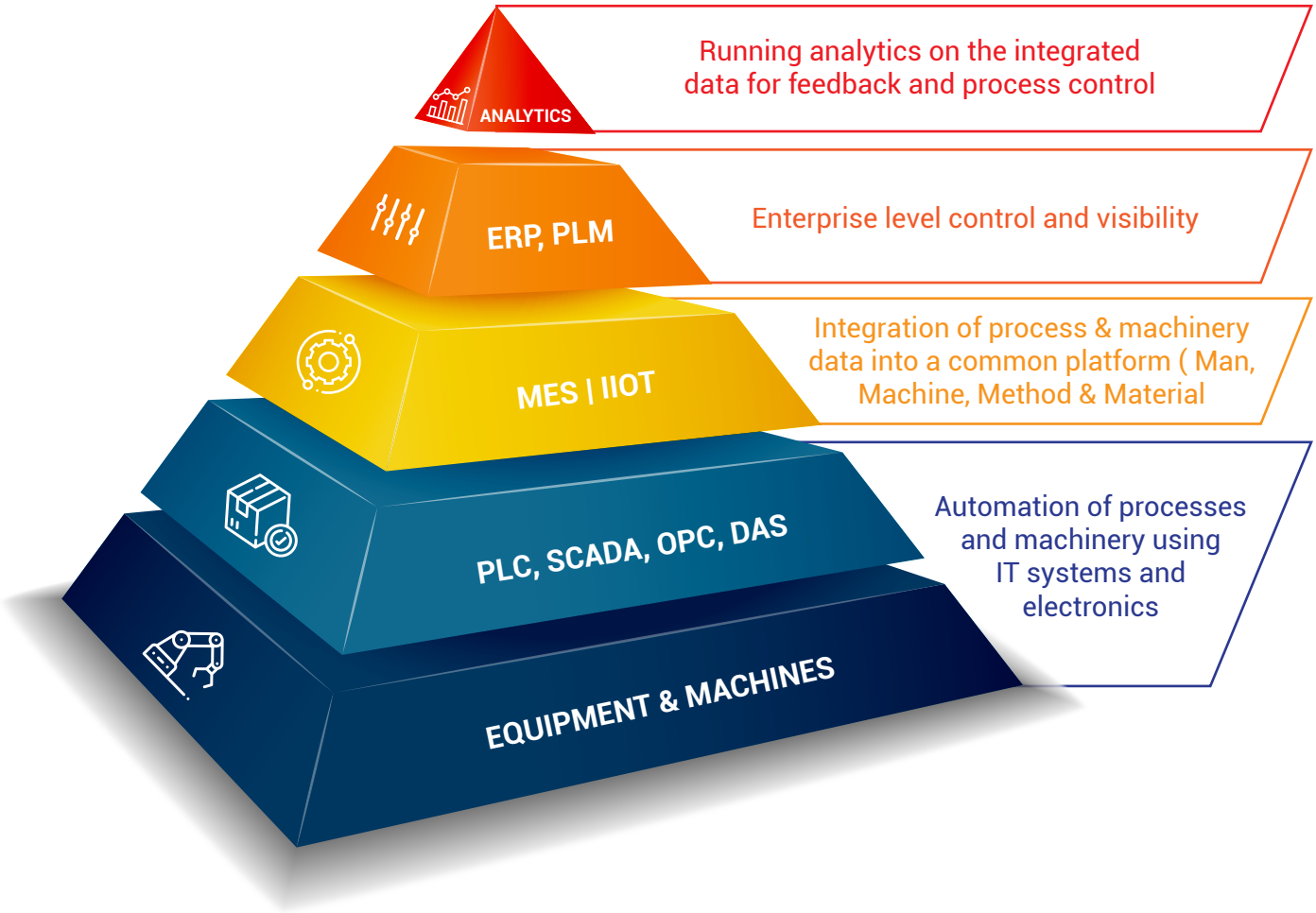
As we move ahead to discuss how **Manufacturing Execution System (MES)** enables building a future-ready factory, let's look at a generally accepted description of what a future-ready factory would look like. A future ready factory will be 'Digital Ready' and 'Smart' to be significantly autonomous, connected both horizontally and vertically, leveraging tools and technologies of Industry 4.0 to deliver high levels of efficiency, productivity, speed of delivery, quality, and cost competitiveness, which would not have been possible otherwise. Leveraging Artificial Intelligence and Data Analytics tools, these factories will rely on real time, insightful inputs for faster and more acute decision making. Going a step further, using machine learning technology, highly automated equipment and processes will be autonomous and reliable in these factories. A future-ready factory will offer a very high level of flexibility and mass customization opportunity that will shorten order to delivery lead time, allowing for the supply chain to be lean, responsive and reliable.

MES ENABLING DIGITAL TRANSFORMATION JOURNEY

Building a Digital Factory is a high priority agenda for most CEOs across the globe. As per McKinsey Digital Manufacturing Global Expert Survey 2018, nearly 70 percent respondents on average say that "Digital Manufacturing" is a top priority. Investments in implementation of newer technologies and processes is increasing every year and is expected to accelerate with every passing day. As per market research reports, the MES market has grown at a CAGR of 11% in the past five years and is expected to grow at a similar pace for coming five years as well. As companies move in this direction, many have understood the relevance and importance of a "Manufacturing Execution System", while many others still underestimate the benefits that an MES system can bring to an organization.

In our understanding and experience, MES is one of the many building blocks of a Digital Factory. While an ERP system along with an SRM and CRM helps horizontal integration of the value chain, an MES helps largely in the vertical integration of an organization. Data in the current world is considered as one of the most precious resources and rightly so. If available at the right time, in the right format, it can bring in multiple insights that will help shop floor associates and managers take necessary actions and improve plant performance.

There is a lot of buzz about the power of Big Data, **Analytics**, Artificial Intelligence, Machine Learning, etc. However, what we tend to miss often is that the success of these tools is highly dependent on availability of real time and accurate data. MES helps achieve this, along with many other objectives of a shop floor digitization program. For a Digital Factory, end-to-end connectivity is also a critical element to ensure seamless information flow (in both directions) to guarantee the shortest response time to an incident or trend on the shop floor. MES is an effective tool to connect machines on the shop floor (for data collection) to advanced analytics platforms for real time data analysis and providing insights for necessary and timely action.



MES implementation can help end-to-end integration across processes on the shop floor, starting from material receipt to dispatch, stores & warehouse management, Inventory Management, Production operation management, Quality Management, Maintenance Management. Most MES solutions provide reporting and a dashboard module for KPI tracking at the equipment, section, and plant level. MES can seamlessly connect with other IT applications across the organization for data exchange to eliminate duplicate data entry requirements and provide performance tracking capability across the enterprise.

Key Application Areas

Production

Deliver manufacturing excellence to one plant floor or many - across the globe

Quality

Unify quality across manufacturing operations for a comprehensive, enterprise approach to qualtiy management to achieve sustained manufacturing excellence

Warehouse

Extend manufacturing excellence to the warehouse with a unified solution that synchronizes material with production

Maintenance

Synchronize maintenance management with production and quality across plant activities for greater equipment uptime, manufacturing, productivity and excellence

Time & Labor

Coordinate labor with all plant acticities to drive productivity and manufacturing excellence

Reports & Dashboards

Achieve real-time enterprise manufacturing intelligence to improve visibility, synchronization and control

BENEFITS OF MES IMPLEMENTATION

In our experience, if the solution is properly designed and deployed, MES implementation helps improve critical operational KPIs such as productivity, first pass yield, quality rate, efficiency, cost of conversion, etc., to enhance overall customer satisfaction and business performance. **ITC Infotech** has helped Global **CPG** customers improve performance on KPIs that matter the most to their businesses. For a CPG company, machine efficiency improved by 6% after MES implementation and the inventory carrying cost reduced by 4% per factory. Similarly, we have improved first pass quality by 3% for a Global Heavy Machinery customer across its 6 factories. Another MES implementation at a 2-wheeler manufacturer led to the integration of suppliers for critical parts traceability without impacting takt time for assembly.

Using the MES platform, large enterprises have standardized similar processes across multiple manufacturing plants operating in different geographies. While this has helped in process standardization, it has also resulted in improved consistency, efficiency, and compliance. Pharmaceutical customers use MES to ensure data integrity and effective investigation of deviations, to be compliant with the global regulatory requirements. CAPA management is one of the features in the MES that helps manage workflow for an effective investigation and Root Cause Analysis followed by an effective Corrective and Preventive Action (CAPA) implementation.

One of the other key benefits of an MES implementation is the enhancement in the traceability and genealogy across the supply chain. In case of a quality deviation, product recall or batch control, this in-built feature of MES helps easy and speedy data retrieval and reduces the investigation time significantly.

The world is moving towards sustainable development and Green Factory is the new norm. Paperless factory is one of the many attributes that define a Green Factory. While MES enables shop floor digitization, it is one of the key drivers of a paperless factory since most of the data, information and reports travels digitally across the organization.

CONCLUSION

For organizations planning a digital transformation journey, the steppingstone will be to develop a digital transformation roadmap that will enable business growth. Defining short-term and long-term goals of technology adoption, the benefits expected at the business, customer, and operational level will be an integral part of the roadmap development process. Deploying tools and technologies that will ensure real time data collection and analysis, vertical and horizontal integration across the organization will form the initial steps of the digitalization journey. Once the integration process is completed, deploying analytical solutions for actionable insights should be the next step, followed by the use of Artificial Intelligence and Machine Learning technology for an autonomous operation. Technology implementation should also be utilized as an opportunity to standardize systems across the global operations. MES has helped achieve this objective for many of the global enterprises.

For a global CPG company, ITC Infotech has implemented MES for process standardization, compliance enhancement to global operating standards,efficiency and productivity improvement, better visibility of KPIs at the shop floor and many other benefits. Their ambitious plan to create a global template and rollout in 65 manufacturing plants in various parts of the globe has been successful and very rewarding. This is one of the few organizations that has leveraged the full potential of an MES implementation.

The next article will detail out the approach, challenges and benefits of ITC Infotech's MES implementation in this organization. Stay connected!

AUTHOR PROFILE

Nitin Kalothia is an Associate Partner in the Business Consulting Group of ITC Infotech. In his current role, he works closely with Manufacturing Execution System team in bringing a consulting approach to MES solution design and implementation. He has over 17 years of total work experience in operation excellence and technology consulting. Nitin has been instrumental in driving manufacturing transformation through use of Technology and Lean Manufacturing Principles. He has also developed and deployed Smart Factory Framework for manufacturing organizations.

About ITC Infotech

ITC Infotech is a leading global technology services and solutions provider, led by Business and Technology Consulting.ITC Infotech provides business-friendly solutions to help clients succeed and be future-ready, by seamlessly bringing together digital expertise, strong industry specific alliances and the unique ability to leverage deep domain expertise from ITC Group businesses. The company provides technology solutions and services to enterprises across industries such as Banking & Financial Services, Healthcare, Manufacturing, Consumer Goods, Travel and Hospitality, through a combination of traditional and newer business models, as a long-term sustainable partner.

ITC Infotech is a fully-owned subsidiary of ITC Ltd, one of India's foremost private sector companies and a leading multi-business conglomerate.

www.itcinfotech.com | contact.us@itcinfotech.com