ITC INFOTECH

Business-friendly Solutions

INSIGHT for Cognitive Manufacturing

OVERVIEW

Most of the manufacturers are currently reaping the benefits of first phase of Industry 4.0 initiatives and are getting ready for the next phase. In the first phase, manufacturers focused on real time production visibility and reporting through comprehensive connectivity on shop floor. The next groundbreaking level to be achieved in manufacturing transformation is intelligent manufacturing systems which can be realized through combination of connectivity and technologies like advanced analytics & machine learning. Based on the outcomes of the first phase, production personas can collect large amount of high-quality data using sensors. Vertical and horizontal data integration guarantees seamless data exchange, and a large amount of data can be stored and managed via cloud technologies. Artificial Intelligence & Machine Learning in manufacturing will open completely new possibilities in this direction.

ITC Infotech's 'INSIGHT for Cognitive Manufacturing' enables organizations to leverage the production data and enable greater insights for optimization of manufacturing operations for higher efficiency gains. The solution helps various shop floor personas with not just real time as-is production operations view but more advisory centric insights across four dimensions of operations

Asset Advisor

Provides remaining useful life and predicted maintenance date of the assets based on the model derived through historical data and current constraints

Process Advisor

Aids the quality manager to ensure all the products are of good quality by monitoring the real time values of key parameters and notifying when there are deviations

Sustainability Advisor

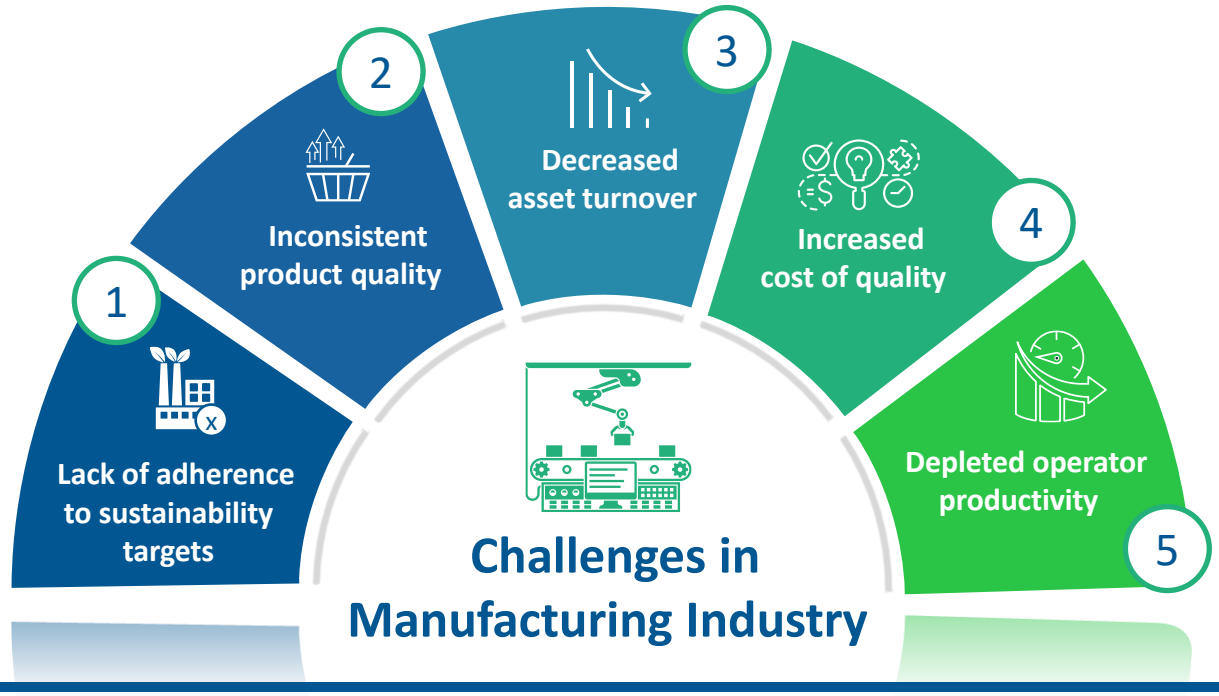
Ensures the plant is running within the committed energy consumption levels, monitor and optimize energy consumption

Quality Advisor

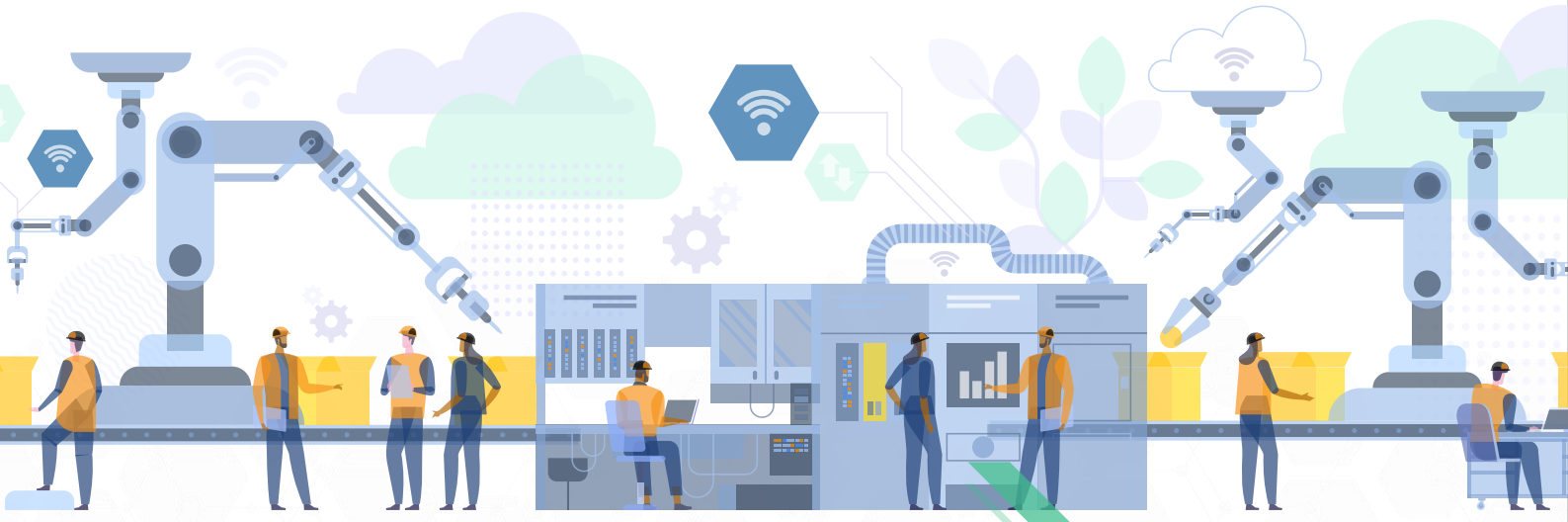
Brings in significant improvement in quality inspection through digitization of visual inspection thus increasing accuracy and reduction of inspection time

Challenges

Despite the instability in economic conditions manufacturing industry is expected to continue to grow in the next few years. Following are some of the internal challenges faced by the manufacturers:



ITC Infotech's 'INSIGHT for Cognitive Manufacturing' solution helps to address these challenges and spearheads the manufacturers to the next phase of Industry 4.0.



The Solution

'INSIGHT for Cognitive Manufacturing' is a PTC ThingWorx powered solution developed to help manufacturers traverse through the next phase of their Industry 4.0 journey. It comprises of advanced Industry 4.0 use cases spread across various areas such as asset, process, sustainability, and quality. Following are the details of the use cases under the INSIGHT framework:

Asset Advisor

Predictive maintenance is the critical component of asset advisor. Traditionally manufacturers have been relying on preventive and scheduled maintenance. Asset advisor has prebuilt algorithms which need to be fed with data sets to ensure accurate prediction of equipment failure date and the maintenance date. This reduces unplanned downtime thereby increasing productivity and capacity utilization.

Process Advisor

Manufacturers are always challenged in improving yield in productions. Traditional control systems do an excellent job at controlling equipment when all parameters are relatively stable. However, equipment age, raw material characteristics vary depending on the batch or supplier, and other environmental parameters. Therefore, it is not always possible for operators to consistently adapt control parameters and do it in a timely fashion to ensure optimum production yield, quality, and waste reduction. Operators today continue to heavily rely on their experience, intuition, and judgement. Process advisor's in-built algorithms determines the association between the monitored parameters and quality of the product. Process advisor constantly monitors the parameters and provide an alert if any deviations arise so that necessary interventions can be taken to ensure consistent quality.

Sustainability Advisor

Energy consumption is significant in several industries and there is a need for optimum use of energy, even under varying operating conditions. ESG compliance is mandatory for most of the companies and sustainability advisor tracks the key KPIs associated with sustainable manufacturing such as energy intensity, emission of greenhouse gases, % of waste re-used, etc., The efficiency model constantly monitors the energy consumption of assets and compares them with compliance standards. It also has capability to scale up these consumption metrics to a production area level as well. This advisor is not isolated to assets in a manufacturing plant but can be extended to monitor sustainability of any facility or building.

Quality Advisor

Machine vision surpasses human vision at the quantitative and qualitative measurement of a structured scene because of its speed, accuracy, and repeatability. Machine vision system is more accurate and faster as compared to a human eye inspection. Quality Advisor has ready-to-use algorithms which can quickly train the model to ensure classification between good and bad images. The machine learning algorithm present iterates to sharpen the model thereby increasing the accuracy levels.

Solution Features:

Asset Advisor

- Ready-to-use algorithms which quickly analyzes the historical data and derives the components, associated parameters, their dependencies and monitors the value trends during normal operations and during anomalies
- Predict the rest of life for components/assets and propose a maintenance date to prevent failure
- Easy to extend and deploy to multiple assets within a plant or across multiple other plants

Process Advisor

- Pre-built logic which takes historical data as input and develops a model on the trend of influencing parameters during various intervals across varying quality output
- Observe and alert for deviations in key influencing parameters to ensure consistent quality outputs

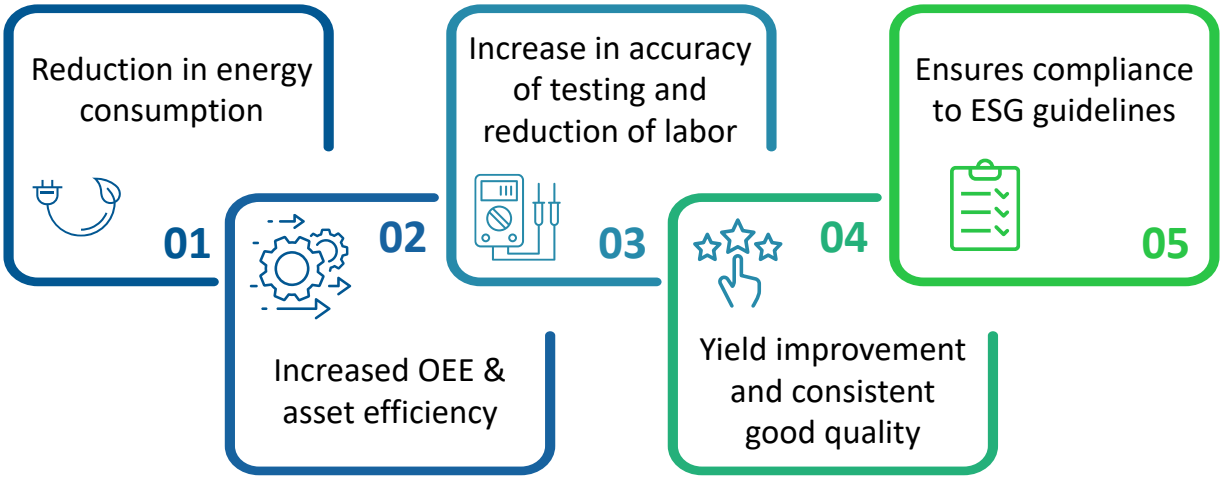
Sustainability Advisor

- In-built efficiency model to monitor energy consumption of assets and compare them to benchmarks

Quality Advisor

- Easy to train and deploy visual inspection models thereby decreasing significant effort and time in implementation
- Machine learning model ensures continuous enhancement of algorithm there by increases accuracy

Business Benefits



About ITC Infotech

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