

Manufacturing Cloud Command Center on AWS



Abstract

Manufacturing Leaders miss key insights that can be derived by connecting multiple factories and comparing their performances across the key Metrics. They should identify the best-performing entities, leverage them, and learn from them.

Manufacturing Cloud Command Center connects multiple factories and enterprise apps like ERP/MES. It provides E2E Visibility & Analytics for key KPIs across the Enterprise level (Geographies/ Product Groups), Factory level(Lines/ Stations), and the Machine level.

This is a unique solution, which addresses multi-layered visibility, and traceability (across Enterprise, plant, and machines) and helps users benchmark and learn from their peers.

Introduction

Manufacturing leaders miss key insights that can be derived by connecting multiple factories and comparing their performances across the key metrics. On the other hand, factory leaders and managers observe suboptimal factory performances due to a lack of granular visibility and insights across their production lines, stations, and machines.

'**Manufacturing Cloud Command Center**' connects multiple factories, and enterprise apps like ERPs/MES to provide end-to-end visibility.

For manufacturing leaders, it provides end-to-end visibility across all geo/ divisions/ product groups/factories for key KPIs. The solution standardizes the monitoring mechanisms across the organization and ranks the best-performing entities.

For the factory team, it enables end-to-end monitoring across production lines, stations, and machines. They can learn from the best-performing factories.

The solution leverages QuickSight (an ML-powered BI tool) for NLP-based searches, identifying trends, detecting anomalies, receiving proactive alerts, and self-service visualization that enables higher flexibility for the users.



Our Solution

'Manufacturing Cloud Command Center' connects factories across the organization and enterprise apps like ERPs. For manufacturing leaders, the solution provides end-to-end visibility across all geographies / product groups/ factories for key KPIs, develops standardized monitoring mechanisms, rank/reward the best performing entities, and leverages analytics to identify trends and improvement areas, and suggest meaningful targets. For the factory team, it enables end to end monitoring, proactive alerts, cognitive escalation, and historical performance tracking. They can learn from the best-performing factories across the organization.

The solution leverages AWS Quicksight, a machine learning-powered data visualization/ business intelligence tool. The solution successfully cleared the Foundational Technical Review by AWS which assures that our solution follows AWS Well-Architected best practices.

The key use cases of our solution are:

Use Case(s)	Role(s)	Customer Issues	How does the APN partner address the issue (Solution)?
End-to-end visibility across the organization	Leaders	Lack of enterprise level insights	The solution connects multiple factories and provides end-to-end visibility across all geographies/ divisions/ product groups/ factories for key KPIs
Compare multiple factories and learn from the best	Leaders	Compare factories/ product groups/ geographies and learn	Compares performances of entities across the key KPIs. It ranks the best-performing entities and learns from them.
Standardized organization -level metrics/KPIs	Leaders	Common monitoring mechanism	Create enterprise level, standardized monitoring metrics Implement fact-based rankings and rewards for best performing entities.
Redirect production	Leaders	Maximize utilization of best performing entities	Redirecting production from poor performing factories/ manufacturing lines to the best performing entities.
Granular visibility: line, station, and machine level	Factory heads and managers	Lack of granular visibility	End-to-end monitoring of key plant KPIs Historical performance tracking
NLP search and self-service visualizations	Factory leaders/ users	Need flexible insights for the diverse user base across the company	Users to search the key metrics using their natural language leveraging the NLP capabilities. Users to create a custom visualization based on their needs
Machine learning-based forecasting and anomaly detection	Factory leaders/ users	Plans for upcoming months is not based on the reliable forecasts.	Predict the future value of the key metrics and revisit the plan. Detect anomalies across KPIs and perform contribution analysis to understand the root cause.
Proactive Alerts	Factory users	Need faster alerts, during deviations.	Need timely alerts to the users whether there is a deviation of any specific metrics.



ERP



PLM



MES/EAM

Enterprise Apps



Manufacturing Cloud Command Center

Plant 1



Shop floor Automation



Robots



Machines



Smart Sensors

Human Input



Wearables



HMI/Computer

OT Apps



Shopfloor Apps

Unstructured Data



Audio/ Video

Plant “..”



Plant “N”



Benefits

Enterprise-level and granular level visibility along with business insights typically result in 5-10% improvement in OEE and 5-15% improvement in EBITDA.

Typical benefits across the manufacturing value chain are:



5-10% improvement in productivity

- End-to-end visibility and insights view across all the enterprise, plant, line, station, and machine levels to improve throughput



10-30% reduction in rework and scrap

- Predict anomalies, identify trends and improvement areas, and create proactive alerts to improve first-time pass.



15% reduction in breakdown maintenance

- Analysis of key maintenance metrics with historical tracking and insights to improve the maintenance activities.



10-20% reduction in delivery lead time

- Identify bottlenecks, leverage alerts, and learn from the best-performing factories and manufacturing lines.

Tech Mahindra NXT.NOW™ Advantage

TechM's industry 4.0 assessment framework maps the client requirements to KPIs and provides actionable insights that deliver tangible business value.

TechM's advanced tools, proven AI-ML models, and accelerators for faster implementation and a demo for faster GTM.

TechM has impressive success stories including Implementing the solution for a large auto tier-1 in the US connecting their 35+ factories and achieving proven benefits. In addition, TechM has also established digital operations for a global appliance manufacturer.

Tech Mahindra

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