



IIOT Application in Predictive Maintenance (Manufacturing)

Unit Code: ASC/N6463

Version: 1.0

NSQF Level: 5.5

Automotive Skills Development Council || 153, GF, Okhla Industrial Area, Phase 3
New Delhi 110020 || email:garima@asdc.org.in

Description

An individual at this job is responsible for Monitoring and analyzing real-time data through collect, process, and interpret data from various sensors and devices connected to the IIoT network to identify patterns and trends that could impact the manufacturing process.

Scope

The scope covers the following :

- Integrate Manufacturing Machinery into EDGE devices, servers in the IIOT network.
- Verification of Manufacturing system integrated in the IIOT Network Via Communication Protocol.
- Manage deployment of IIOT & Develop Maintenance Trends & Patterns.

Elements and Performance Criteria

Integrate Manufacturing Machinery into EDGE devices, servers in the IIOT network

To be competent, the user/individual on the job must be able to:

- PC1.** Engage with key stakeholders, including executives, managers, and operational teams, to understand their specific data visualization and reporting needs
- PC2.** Identify and integrate relevant data sources, including IIoT sensors, manufacturing databases, and ERP systems
- PC3.** Choose appropriate data visualization tools such as Tableau, Power BI, or custom-built solutions to align with the complexity of data and the preferences of end-users.

Verification of Manufacturing system integrated in the IIOT Network Via Communication Protocol

To be competent, the user/individual on the job must be able to:

- PC4.** Verify the Manufacturing systems & devices integrated as per design documents
- PC5.** Guide the team during verification of the connections on IIoT Sensors, I/O-Links to the machines, robots Automation systems with the appropriate Network Protocol Like OPC UA, Mod Bus
- PC6.** Manage the activities related to device protocol upgraded to IIOT network protocol.
- PC7.** Document the design principles, rationale, and guidelines used in the dashboard architecture

Manage deployment of IIOT & Develop Maintenance Trends & Patterns

To be competent, the user/individual on the job must be able to:

- PC8.** Identify the specific real-time data points and metrics relevant to manufacturing operations & define appropriate refresh rates for updating real-time data on the dashboard.
- PC9.** Integrate customization features that allow end-users to personalize their dashboard views and reporting systems to generate periodic reports
- PC10.** Implement measures to validate the quality and accuracy of real-time data & Enable user interaction with real-time data through features like zooming, panning, and filtering
- PC11.** Integrate notification and announcement features to alert users of significant events derived from real-time data.
- PC12.** Record the Deployed IIOT Networks on Predictive Maintenance Trends.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** Organization procedures for health, safety and security, individual role and responsibilities in this context.
- KU2.** Organization's emergency procedures for different emergency situations and the importance of following the same.
- KU3.** Understanding the fundamentals of IIoT, including sensor technologies, data communication protocols, edge computing, and cloud integration
- KU4.** Familiarity with different types of sensors used for monitoring manufacturing assets and the principles of data acquisition.
- KU5.** Understanding of data transmission protocols, edge computing concepts, and their applications in IIoT.
- KU6.** Knowledge of cyber security principles, encryption methods, and access controls for securing IIoT data.
- KU7.** Understanding of SCADA, ERP, and other manufacturing systems and their integration with IIoT applications.
- KU8.** Awareness of data privacy regulations, industry standards, and compliance requirements
- KU9.** Data Transmission Protocols like MODBUS, Ethernet.
- KU10.** Understanding of factors influencing scalability in IIoT applications
- KU11.** Knowledge of Visualization Tools like Tableau, Power BI

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** read safety instructions/guidelines
- GS2.** modify work practices to improve them
- GS3.** work with supervisors/team members to carry out work related tasks
- GS4.** Complete tasks efficiently and accurately within stipulated time
- GS5.** inform/report to concerned person in case of any problem
- GS6.** make timely decisions for efficient utilization of resources
- GS7.** write reports such as accident report, in at least English/regional language

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Integrate Manufacturing Machinery into EDGE devices, servers in the IIOT network</i>	12	12	-	8
PC1. Engage with key stakeholders, including executives, managers, and operational teams, to understand their specific data visualization and reporting needs	4	4	-	2
PC2. Identify and integrate relevant data sources, including IIoT sensors, manufacturing databases, and ERP systems	4	4	-	3
PC3. Choose appropriate data visualization tools such as Tableau, Power BI, or custom-built solutions to align with the complexity of data and the preferences of end-users.	4	4	-	3
<i>Verification of Manufacturing system integrated in the IIOT Network Via Communication Protocol</i>	16	16	-	6
PC4. Verify the Manufacturing systems & devices integrated as per design documents	4	4	-	1
PC5. Guide the team during verification of the connections on IIoT Sensors, I/O-Links to the machines, robots Automation systems with the appropriate Network Protocol Like OPC UA, Mod Bus	4	4	-	2
PC6. Manage the activities related to device protocol upgraded to IIOT network protocol.	4	4	-	1
PC7. Document the design principles, rationale, and guidelines used in the dashboard architecture	4	4	-	2
<i>Manage deployment of IIOT & Develop Maintenance Trends & Patterns</i>	12	12	-	6
PC8. Identify the specific real-time data points and metrics relevant to manufacturing operations & define appropriate refresh rates for updating real-time data on the dashboard.	3	3	-	1
PC9. Integrate customization features that allow end-users to personalize their dashboard views and reporting systems to generate periodic reports	3	2	-	2

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. Implement measures to validate the quality and accuracy of real-time data & Enable user interaction with real-time data through features like zooming, panning, and filtering	2	3	-	1
PC11. Integrate notification and announcement features to alert users of significant events derived from real-time data.	2	2	-	1
PC12. Record the Deployed IIOT Networks on Predictive Maintenance Trends.	2	2	-	1
NOS Total	40	40	-	20

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N6463
NOS Name	IIOT Application in Predictive Maintenance (Manufacturing)
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Production Engineering
NSQF Level	5.5
Credits	2
Minimum Educational Qualification & Experience	Completed 3 year UG degree (In trades: Manufacturing/Mechanical/Automobile/Electrical/Electronics/IT or relevant) OR Pursuing 3rd year of UG (In trades: Manufacturing/Mechanical/Automobile/Electrical/Electronics/IT or relevant)
Version	1.0
Last Reviewed Date	NA
Next Review Date	NA
CCN Category	1