

IoT M2M Middleware Solution

i Introduction

The IoT M2M middleware solution is a platform for integrating and enabling advanced automation for handling of diverse data sources from agriculture and forestry.

The technology will operate behind the scenes to establish trouble-free and seamless interconnection, enhanced functionality of field devices and the FMIS adaptation of potentials of precision farming and smart farming.



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Customer

The customer is an international Multi-Disciplinary R&D Performing SME. They deliver top quality research and innovative solutions for ICT, Engineering, Mathematics, and Physics.



Requirement

To monitor agriculture field sensor data and take proactive actions which improves the crop quality, increase the food and fiber production.

To develop and demonstrate a pre-commercial intelligent integrated solution prototype based on a cross platform OPC unified architecture (OPC UA) specification entitling standards and related technologies for communication between automation systems and IT systems in farms and forest related process.

For their integrated solution, data needs to be extracted from multiple field level sensors and then make it available on the IoT Platform for further usage.

This communication is divided into 3 parts.

- ▶ OPC Session
- ▶ OPC Monitoring
- ▶ Scheduling



Challenges

- ▶ Real time livestock data information gathering.
- ▶ Real time agriculture field level sensor data gathering and proactive actions on that.
- ▶ Development of an input-output gateway module based on the OPC UA model specification for unified automation, including wireless standards for medium/long range.
- ▶ The system is addressing needs for seamless data transfer between complex field devices/automation systems and IT systems.



Solution

With the help of the IoT M2M middleware application, an organization can get data from field devices into its enterprise level solution. This application is integrated to an IoT product that collects data from multiple field level sensors and stored it in local DB. The data can be further used to generate reports or can be made available on various APIs.

OPC Session

- ▶ Application can have only one session per End Point. This session will be shared across devices.
- ▶ When Admin creates a session, a connection to the OPC Server is established.. If connection is established the connection is stored in the Pool. Here Pool is nothing but a background thread which is active throughout the application life cycle.

OPC Monitoring

- ▶ OPC Monitoring is based on OPC subscription.
- ▶ Monitoring is applied on a value.
- ▶ In monitoring, the OPC server pushes the data to the IoT M2M middleware whenever a value changes.

Scheduling

- ▶ Scheduling is applied on multiple fields, usually on a device level. A recurring interval is set on the platform, which pulls data from the OPC Server and stores on its own database.



Benefits

- ▶ Provision of a platform for aiding interoperability, connectivity and coherence amongst agriculture systems, equipment and processes.
- ▶ Apply standardized data formats for improved utilization of agriculture information sources and research data.
- ▶ Gather data from multiple sources
- ▶ Monitor and get only changed/update values instead of all the data

- ▶ Device Management - Manage multiple devices, categorize multiple data fields and values into single device
- ▶ Data Aggregation - Get all of your data, from multiple sources, at a single place!
- ▶ Export Data - Analyze collected data and generate different type of reports.
- ▶ Dashboard & Custom Graphs – create different type of graphs against device.

- ▶ Reporting is the core of application; all the reports are working as per business rules and providing output as expected by client.



Conclusion

The application ensured that organization can collect data from multiple OPC Servers and enable communication between automation systems and IT systems.



Achievements

- ▶ Real-time livestock data information gathering.
- ▶ Real-time agriculture field level sensor data gathering and proactive actions on that.
- ▶ Currently deployed live application is very user friendly where the user can monitor data coming from multiple sources on a single portal
- ▶ Its dynamic in nature and data synchronization facility is provided.
- ▶ Security, reliability, data safety backup,

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IoTSense is powered by Winjit Technologies which is an award-winning technology company for providing IT product and solutions globally.



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