Factory Operations Visibility & Intelligence

Overview

Factory Operations Visibility and Intelligence (FOVI) is designed to collect sensor data generated on the factory floor, production-equipment logs, production plans and statistics, operator information, and to integrate all this and other related information in the cloud. In this way, it can be used to bring visibility to production facilities, analyze and predict outcomes, and support better decisions for improvements.

Applicable Industries

- Automotive
- Heavy Vehicle

Applicable Functions

- Facility Maintenance
- Procurement & Sourcing
- Production - Manufacturing

Case Studies

How Touchscreens Can Motivate Assembly Line Workers to Do Quality Work

When UTC Aerospace required a solution to manage assembly line workers with no previous manufacturing experience, it decided to try something new that set a precedent for its future manufacturing oper ...

FMCG Case Study – CPG Line Monitoring

The leading CPG company operates several warehouses, mostly closer to the last distribution point (Large retailers). Products in various categories are packaged in specific delivery or display cartons ...

Scaling Data Science for the Industrial IoT

Conventional techniques for extracting and testing algorithms must get smarter to keep pace with the phenomena they're tracking. The challenges are mainly in the following areas:
- Volume, velocity ...

Market Size

Estimate A	The industrial control and factory automation market is projected to reach USD 153.30 Billion by 2022, at a CAGR of 4.88% during the forecast period. Source: marketsandmarkets.com
Estimate B	Unlocks 25B of Industry 4.0 value Source: japantag-duesseldorf-nrw.de
Estimate C	Worth up to 75B by 2022 Source: marketsandmarkets.com

User Viewpoint

Business Value

How does this use case impact an organization's performance?

A smart infrastructure in a factory can push data regarding the production process to the cloud. Then, a custom factory simulation can be developed, allowing the management to view the entire process holistically, and begin to understand where efficiency can be enhanced, or costs can be cut.

FOVI will result in a better analysis of inefficiencies and causes of defects, reduced rate of product rejection, faster product repair, and related cost savings, enhanced product quality and production throughput, ability to handle higher volumes. This can easily be translated into concrete dividends for the firm.

System Capabilities & Requirements

What are the typical capabilities in this use case?

According to IIC, system capabilities includes ability to combine, visualize, and correlate diverse data sources that greatly vary in nature, origin, and lifecycles; Available as a cloud-based service; Support for Manufacturing and Repair process control based on priorities in delivery schedules; Extensibility with enhanced visual rendering tools for process status and flow, product tracking, schedules, and machinery status; Plug-in capabilities for analytics and diagnostics.

Deployment Environment

Where is the 'edge' of the solution deployed?

The platform of FOVI systems can be deployed in any factory operation sites. System requirements differ significantly based on the environment due to safety, data security, and regulatory factors.

Stakeholder Viewpoint

Investment Decision Makers & Influencers

Which organizations, departments, or individuals typically makes an investment decision and allocates budget?

The owners of factories are the investment decision makers for the purchasing of agricultural drones.

System Operators

Which organizations, departments, or individuals are responsible for

operating and maintaining the system?

The IT team of the factory are typically the system operators.

System End Users

Who are the regular users of the system?

End users are the IT team and operation team who use the system to help them with factory digitalization. End users can also be the service companies who provide system services to factories.

External Data Users

Which external stakeholders are provided with limited access to the data?

System developers and industrial researchers could be the external data users to improve their products.

Technology Viewpoint

Analytics

What types of analysis are typically used to transform data into actionable information?

By applying advanced analytics to the data their systems generate, factories can identify and predict performance bottlenecks and make smarter decisions about how to improve factory operations, manage workforce and supply chain risks, and enhance the product design process.

Real-time analytics: With millions of intelligent devices streaming huge volumes of data continuously, it's imperative that the IIoT platform, which must deal with data ingestion, processing, storage and predictive analytics in order to provide meaningful and actionable insights in a timely manner, operates in near real-time. Indeed, such sophisticated analytics as a real-time pipeline leakage capability requires a streaming analytics platform that delivers meaningful and actionable insights from processed data in a matter of seconds. In Europe, for example, a large utility company is using sensors and analytics to anticipate pipeline leakage in real-time. Maintenance work can be scheduled at the appropriate time, not only significantly reducing unscheduled downtime, but also the costs associated with ordering replacement parts urgently and bringing in unscheduled maintenance workers at short notice, which is typically charged at a much higher rate.

Edge intelligence: Initially, IT/OT integration will involve the movement of IIoT data to the cloud for further processing and analytics. But limited network bandwidth, energy availability, and security considerations may necessitate a decentralized distribution model, which, by delegating analytics, intelligence, and decision-making

capabilities to edge devices with the contextual ability to process and analyze data independently, and communicate with other devices to accomplish tasks, could deliver better accuracy, improved performance and timeliness.

Source: accenture.com

Cybersecurity

What factors define the trustworthiness of the solution?

The challenge of implementing a secure, vigilant, and resilient cyber risk strategy is different in the age of Industry 4.0. When supply chains, factories, customers, and operations are connected, the risks posed by cyber threats become all the greater and potentially farther reaching. Cybersecurity should become an integral part of the strategy, design, and operations, considered from the beginning of any new connected, Industry 4.0–driven initiative.

In analyzing the cyber risks of interconnected DSNs, we have identified two main areas impacted by increased supply chain connectivity: data sharing and vendor processing.

Data sharing: Increased access to data for more stakeholders

Vendor processing: Vendor acceptance and payment in a broader market

Source: deloitte.com

Cloud & Edge Platforms

What factors define the cloud and edge platforms used to integrate the solution?

Initially, IT/OT integration will involve the movement of IIoT data to the cloud for further processing and analytics. The connection of digitally networked sensors and sensor-based data to visualization and analytics environments hosted in the cloud or on premises. IIoT enriches existing data ecosystems to enhance decision support for actions influencing control, design, and service in industrial operations.

Connectivity

What factors define the connectivity solutions used to provide both device-to-device and device-to-cloud communication?

IIoT connectivity means that equipment vendors can offer services that increase brand equity and improve customer retention and future product design.

Data Viewpoint

Data Types

What data points are typically collected by the system?

Giving the workforce mobile and wearable technologies such as Daqri's helmet or Apple's Watch can boost employee efficiency on the factory floor by providing real-time access to such data as status, alarms, and instructions while freeing the hands to hold tools or equipment.

Armed with additional external data such as weather conditions, price volatility, traffic conditions, and potential strikes, manufacturers will be able to identify and predict what materials they need at the right time, based on the anticipated production run.

Source: accenture.com

Implementation Viewpoint

Business & Organizational Challenges

What business challenges could impact deployment?

The cost of installation and maintenance of new computers, servers, and network equipment to collect and distribute data needs to be minimized.

Installation Challenges

What installation challenges could impact deployment?

Contextual and background data is often buried and in various formats. Storage and distribution of large amounts of raw data require considerable computing resources and infrastructure.

IoT ONE Use Case

Accelerating the Industrial Internet of Things

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