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The **Value** of FDI

From Instrument to Cloud with FDI

Abstract

“Standardized, intelligent system interfaces are the key success factors to achieve the **benefits of IIoT and Industrie 4.0** in the process industry. They are the foundation for enabling our core processes, supply chain information and plant data to integrate more easily eliminating the need for expensive, proprietary and often custom solutions. **FDI (Field Device Integration)** is a **big step forward** to integrate field devices into automation networks with **standardized, vendor-independent tools and procedures” – NAMUR.**

This article focuses on the key role of FDI in digital transformation by deriving valuable information from field devices to deliver the business value by putting plant performance information in the hands of those who need it.

The audience of this article includes plant owners, instrument suppliers, system suppliers, automation engineers, business and technical leaders in the process industry.



End User Benefits

Asset Performance Monitoring and Optimization

FDI technology is paving the way towards efficient plant asset optimization and hassle-free adoption of the Industrial Internet of Things (IIoT) and Industrie 4.0 by providing secure data to the cloud for enterprise-level application integration. With its backing by **Namur Open Architecture**, FDI along with OPC UA will monitor and optimize the asset performance across the enterprise. FDI provides secure and harmonized access to the field devices over disparate communication channels. KPI monitoring will help business owners in understanding the performance of the key process areas across their global assets, thus saving time and money while improving performance worldwide.

Predictive device maintenance

System life cycle management is a challenging task for both end users and suppliers. In the process industry, every field device needs to be configured, calibrated and maintained over its entire life cycle. Intelligent field devices add difficulties in the maintenance of these critical assets due to their configuration requirements. An unpredicted failure of these assets leads to huge financial losses if they cannot be replaced and reconfigured quickly. FDI Cloud Integration will help in delivering additional insights over time across enterprises to predict and prevent these failures thus improving productivity.

Remote Diagnostics

In a digitalized FDI cloud environment, end users can access the desired information from field devices from any location through the internet for remote diagnostics and supervision of field devices. The communication via OPC UA will provide local monitoring with global overview and aggregation via cloud computing without the need for end users to develop their own global IT infrastructure. This technique offers agility in workflow, increased safety, operational improvements, and reduced costs.

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FDI: Building Block of Digital Transformation

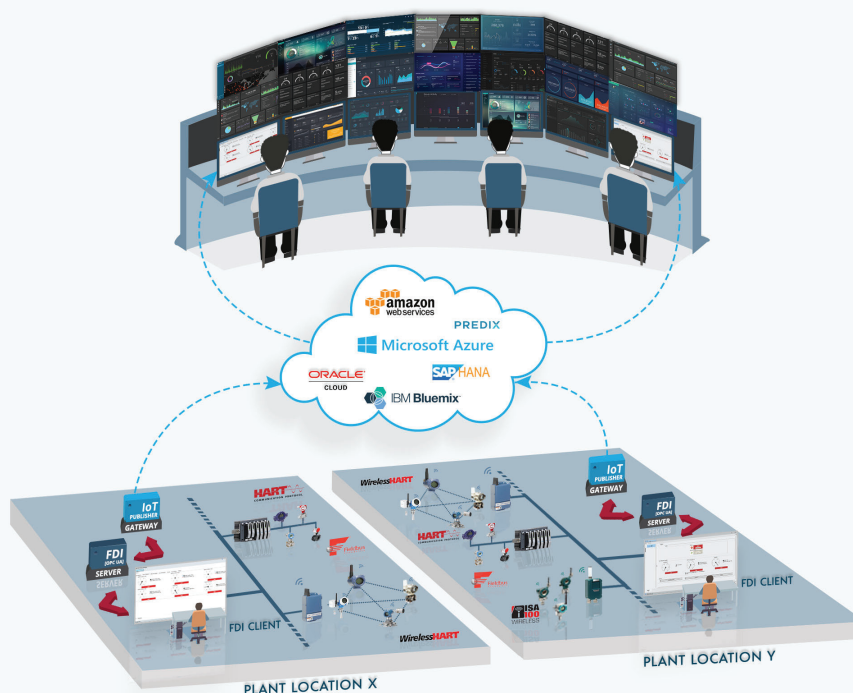
Industrial Internet of Things (IIoT) and Industrie 4.0 are redefining manufacturing at an unmatched level of efficiency, productivity, and performance. IIoT brings together intelligent devices, advanced analytics, and people at work; its services run in the cloud and interact with physical devices via virtual representatives – all with the aim of creating valuable insights.

The potential of IIoT and Industrie 4.0 to bring digital transformation to how the industry works is unparalleled. It will allow automation industries to transit 'dumb' analog architectures to 'smart' ecosystems that optimize assets, predict maintenance schedules, and remotely diagnose impending issues - resulting in improved performance, reduced costs and safer operations for humans and environments.

In a typical industrial environment, it is challenging to fetch meaningful information from multiple vendor host systems over disparate industrial communication networks. For IIoT to work, the convergence of information technology (IT) and operational technology (OT) is essential. It is, therefore, crucial to have a standardized interface to derive valuable information from the plant floor up to the enterprise level.

FDI technology has OPC UA built-in and allows data from intelligent device networks to be utilized by generic applications and to have this data published into the IT world with access to cloud-based applications.

The FDI standard lays the foundation for system-wide interoperability and seamless communication via cloud services. FDI-Cloud integration will help in remote data visualization to increase the transparency in asset performance monitoring and optimization of business operations across the globe.

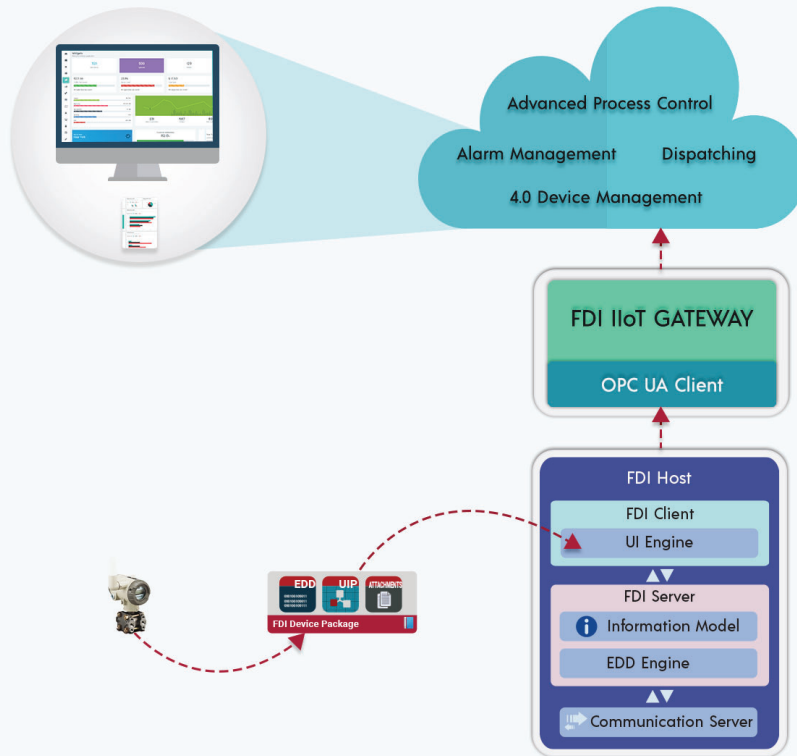


FDI + OPC UA = IIoT Connected

In FDI technology, there are 2 parts to the system: the field side (Device Package) and the host side (Server). On the field side, a device specific software and documentation are encapsulated into its FDI Device Package. On the host side, the FDI Server imports the FDI Device Package and hosts the FDI Information Model, which is accessible by any FDI or generic OPC UA Client application. In this way, FDI IIoT Gateways are able to fetch device information from the FDI Information Model via OPC UA Services and publish it to the cloud for further processing. This enables any enterprise application to access field data for business operations.

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FDI in association with OPC UA will accelerate digital transformation through next-generation IIoT applications like Advanced Process Control, Alarm Management, 4.0 Device Management, and Dispatching.

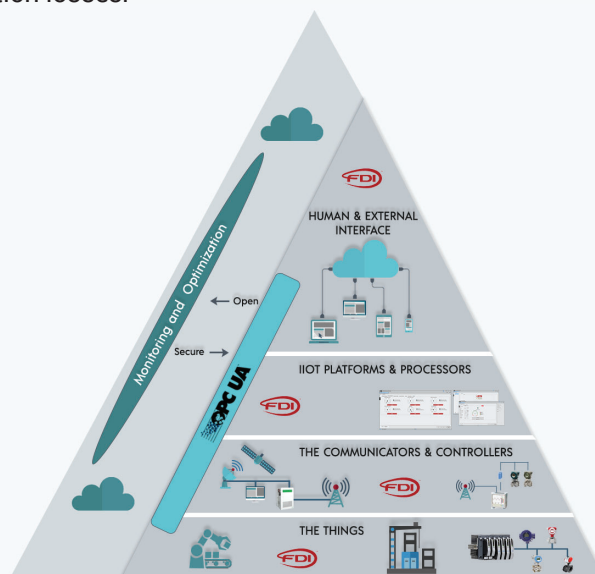


FDI supports NAMUR Open Architecture (NOA)

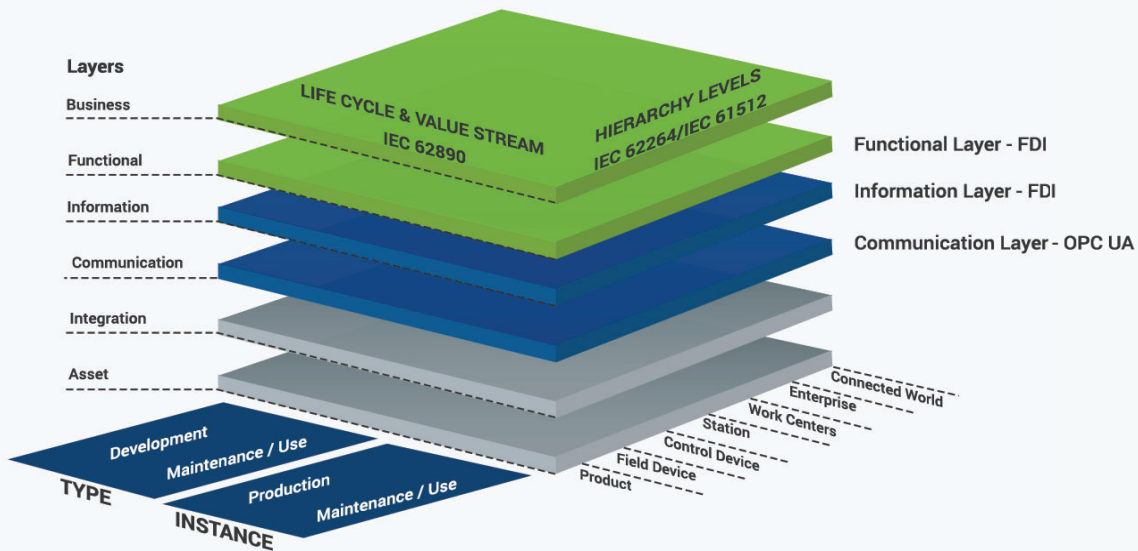
NAMUR aims to equip old and new plants with futuristic Industrie 4.0 monitoring and optimize operations beyond the classic automation pyramid, which consists of field level, basic automation, manufacturing execution and Enterprise Resource Planning (ERP).

NAMUR Open Architecture (NOA) visualizes open and secure access for monitoring and optimizing plant assets without compromising the safety, availability, and reliability of the existing installed base.

NOA enables easy and flexible integration of sensor field data to the monitoring and optimization system via OPC UA and FDI. One of the core elements of the FDI specification is an OPC-UA Server that can be built into compliant products to generate insightful data from field devices to higher-level systems to increase the transparency of plant assets and reduce production losses.



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FDI supports Reference Architecture Model Industrie 4.0 (RAMI 4.0)

German Industry Associations **BITKOM, VDMA, and ZVEI** recommend a **Reference Architecture Model for Industrie 4.0 (RAMI 4.0)** to realize the vision of a “**Smart Factory**”. RAMI 4.0 focuses on automation and seamless exchange of data emphasizing both vertical integration inside the factory setting and horizontal integration across the value chain beyond the factory floor. As shown in the image, RAMI 4.0 captures the three-dimensional representation of the Industrie 4.0 critical components. Six layers in the vertical axis represent the business applications, functional aspects, information handling, communication and integration capability and the ability of an asset to implement Industrie 4.0 features.

FDI integrates seamlessly into the Reference Architecture Model for Industrie 4.0 at the Functional and Information Layer along with OPC UA as the standard for Communication Layer.

Conclusion

The emerging trends Industrial Internet of Things (IIoT) and Industrie 4.0 will unleash new opportunities in the world of industrial automation. However, in the latest wave of the Industrial Revolution, optimization in the process automation industry remains unchanged i.e. **increase the throughput and reduce the cost**. **FDI cloud integration** will facilitate access to real-time information with **improved availability and connectivity** of smart field devices. FDI/OPC UA Information Model provides valuable information that allows cloud-based applications to retrieve field device data for delivering business value.



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