

# 5 DIGITAL TECHNOLOGY SOLUTIONS FOR AGILE INDUSTRIAL ENTERPRISES

- New Age Manufacturing Systems Integration (IIOT)
- Enterprise Systems Integration
- Industrial Simulation
- Applications Development
- Data Analytics



## Five Digital Technology Solutions for Agile Industrial Enterprises

Digital disruption has already begun to affect manufacturing and there is no doubt that it is here to stay. According to a recent study by Fujitsu, it has been discovered that nine in ten (90%) of manufacturing professionals have reported in a survey that this sector has been impacted significantly by digital disruption and 95% of it is expected to be impacted in the future.

Digital technologies have started to redefine the way organizations operate; processes, revenue streams, customer relationships, etc. to name a few. Business leaders have also started capitalizing on digital disruption and also the opportunities it gives for their business.

A majority of the 21st-century factories will tighten the collaboration between people and machines. But the distribution of tasks between them is likely to change dramatically. With digital technologies powering a new industrial revolution, there has been a steady change in speed, quality, flexibility, and productivity.

Given below are the five digital technology solutions for agile industrial enterprises.

## 1. New Age Manufacturing Systems Integration (IIOT):

Industrial Internet of Things (IIOT) connects critical machines and sensors even in critical industries like defense, aerospace, healthcare, and energy. The possibilities of IIOT in the manufacturing sector promises a major change in the industrial world.

### IIOT for advanced manufacturing:

- Better visibility and control capabilities for remote locations.
- Real-time improvement of the manufacturing and supply chain.
- Improvement in plant safety and security.
- Making the manufacturing process a smarter one.

### IIOT for Asset Management:

#### IIOT is helpful in the case of asset management by allowing:

- Prognostic maintenance
- Statistical evaluation
- Taking measurements to increase the reliability

IIOT is still operated in closed environments and is limited only to internal communications. This is done keeping in mind the various threats to security like hacking. Before applying IIOT, it is necessary to analyze the risks involved and see if it is worth taking.

## 2. Enterprise Systems Integration:

Enterprise systems integration is a process of connecting existing systems and making them share and communicate information. Integrating the applications also enabled data to flow with ease between the systems, thus simplifying IT processes and increasing the agility of business processes.

**Many large companies use several kinds of software systems that can potentially benefit from enterprise system integration like:**

- Supply chain management (SCM)
- Customer relationship management (CRM)
- Human resources data
- Business intelligence and analytics
- Accounting software
- Enterprise resource planning (ERP)
- Internal and marketing communications

**Types of Enterprise System Integration Methods:**

**a) Tightly coupled system integration:**

When several systems are tightly coupled, an application allows the requesting system to directly connect with the API of the responding system. This application will create a request in the system and will transfer the request and response. It changes the response from the responding system into something that the requesting system can use.

**b) Service-oriented architecture (SOA):**

This is considered to be a better architectural pattern for enterprise system integration. SOA framework has been used in general software development. SOA is known to provide loose coupling, reusability, and flexibility when compared to its counterpart, tightly coupled architecture.

## 3. Industrial Simulation:

Industrial simulation is primarily used for reducing the risk of mistakes while modifying existing systems or creating new ones using virtual experiments. Everything depends on the model when it comes to industrial simulation. The main purpose of an industrial simulation model is to provide answers to the questions that are quantified.

Here are the different objectives upon which an ideal industrial simulation must be built on:

- **Independent data:**

The model must be based on structure and logics and its construction must not rely on figures. This model must ideally integrate the production plan of yesterday, today and tomorrow.

- **Limited size:**

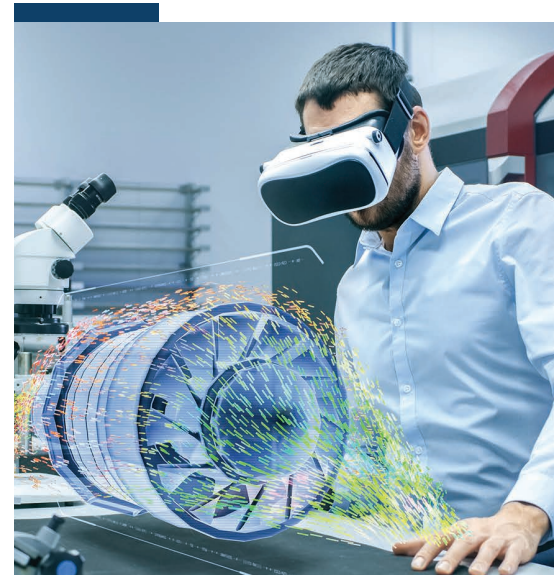
A slender model is considered better as it will be easier to understand and the maintenance is simpler and quicker to run. A big model might be filled with irrelevant details and might be based on poorly defined questions. Two precise and smaller models are better than one big model.

- **Structured Database:**

It is necessary to organize the data related to the model into relational data tables. Creating a database structure is one of the first steps in building a model.

- **Understanding how the User interface will be used:**

The end-user interaction with the UI is built based on their profile and also the time that the user will devote to the simulations. Discussions on this will help in defining the indicators, their format and assists in providing the data tables that we had mentioned above.



## 4. Applications Development:

The global competitiveness is growing rapidly and the market trends are unpredictable with the customer requirements being diversified. This has challenged the manufacturing market to integrate the product support processes, design, and manufacturing to shorten product development time without compromising the quality. Hence, to maximize efficiency, lean manufacturing is considered as the simplest solution to manufacturing. The improvement in the products and services over time calls for applications that are developed with scalability.

Application development in the manufacturing industry helps with resource management, decreases the decision making time and also enhances employability, accessibility and productivity. Integrating the applications into existing business software helps in bridging the gap between humans and machines.

According to recent research on mobile applications in the manufacturing industry, 7 out of 10 experts in the manufacturing field use mobile and wireless solutions to streamline their operations. Applications that will provide an interface to the machines will provide data that will help maintenance technicians to track the operations on the production floor.

## 5. Data Analytics:

Data analytics in smart factories helps find the accurate status of the equipment as well as the order of production operations to make the right decisions. The results of data analytics should be used to improve the intelligence of equipment.

### Platforms for Data Analytics:

Different types of technologies are now emerging related to data analytics. Some of the platforms provide technical components for functions like data collection, storage, and analytics for cloud computing. The users will be allowed to have a flexible choice in selecting any of these components and produce the relevant analysis tool. This would provide a cloud platform for connectivity like security and data uploading services.

The data analytics platform provides the customers with an out-of-the-box analytics system which is characterized by customization, maintenance, and easy deployment. Currently, most of the manufacturing companies do not have the required level of IT expertise. Along their journey, these companies must evolve, acquire and benefit from the latest data analytics technique, instead of being stuck in loophole due to complexity and the increase in specialized requirement of skillsets.



## **What AXISCADES does**

We blend our engineering, manufacturing and industrial enterprise knowledge with technology to help our customers apply digital capabilities to products, processes, and assets. Our experts help you get the single version of the truth and organize your data effectively.

### **New Age Manufacturing Systems Integration (IIOT)**

- Build Tags as you need for any number of devices, OPC servers without limits and connect to any PLC, Databases and enterprise system.
- Collect all your industrial data, connect to any SCADA or ERP system, and build virtually any kind of MES application.
- Reduce operating costs, while increasing asset utilization and operating efficiency resulting in improved profitability.

### **Enterprise System Integration**

- Collect all your data i.e. Machine Data, ERP data, PLM data and other Enterprise data in a centralized, unified data source, leveraging MQTT and Kafka as complementary infrastructure for Enterprise data hub.
- The MQTT & Kafka architecture decouples devices from applications and connects the data to MQTT infrastructure for a superior operational solution and enables cloud for other applications.
- Decoupled architecture separates a system's memory access and instruction cycle processes from execution-stage processes by implementing a data buffer. Both the data fetching and execution stage processes use the data buffer and the processor's pipelining ability to execute both stages' processes in parallel.

### **Industrial Simulation**

Our experts can help you with your end to end simulation needs.

- Build an effective pre-production simulation solution
- Reduce engineering and manufacturing handshake delay
- Reduce the gap between technology development and industrialization

We predict the actions by visualizing and analyzing your data.

AXISCADES is a leading, end to end engineering solutions and product company. We bring expertise that caters to the digital, engineering and smart manufacturing needs of large enterprises. With decades of experience in creating innovative, sustainable and safer products worldwide, AXISCADES delivers business value across the entire engineering lifecycle.

Our deep domain expertise and engineering solution portfolio covers the complete product development lifecycle from concept evaluation to manufacturing support and certification for the Aerospace, Defense, Heavy Engineering, Automotive, Medical Devices & Industrial Product industries.

AXISCADES is headquartered in Bangalore and has offices across India, North America, Europe and the Asia Pacific region.

