

HOW TO IMPLEMENT INDUSTRY 4.0



Design principles and goals

There are four design principles identified as integral to industry 4.0

- Interconnection — the ability of machines, devices, sensors, and people to connect and communicate with each other via the Internet of things, or the internet of people (IoP)
- Information transparency — the transparency afforded by Industry 4.0 technology provides operators with comprehensive information to inform decisions. Inter-connectivity allows operators to collect immense amounts of data and information from all points in the manufacturing process, identify key areas that can benefit from improvement to increase functionality
- Technical assistance — the technological facility of systems to assist humans in decision-making and problem-solving, and the ability to help humans with difficult or unsafe tasks
- Decentralized decisions — the ability of cyber physical systems to make decisions on their own and to perform their tasks as autonomously as possible. Only in the case of exceptions, interference, or conflicting goals, are tasks delegated to a higher level

Components

The Fourth Industrial Revolution consists of many components when looking closely into our society and current digital trends. To understand How extensive these components are, here are some contributing digital technologies as examples:

- Mobile devices
- Internet of things (IoT) platforms
- Location detection technologies
- Advanced human-machine interfaces
- Authentication and fraud detection
- 3D printing
- Smart sensors
- Big analytics and advanced processes
- Multilevel customer interaction and customer profiling
- Augmented reality/ wearable's
- On-demand availability of computer system resources
- Data visualization and triggered "live" training

Mainly these technologies can be summarized into four major components, defining the term “Industry 4.0” or “smart factory”

- Cyber-physical systems
- IoT
- On-demand availability of computer system resources
- Cognitive computing

Industry 4.0 networks a wide range of new technologies to create value. Using cyber-physical systems that monitor physical processes, a virtual copy of the physical world can be designed. Characteristics of cyber-physical systems include the ability to make decentralized decisions independently, reaching a high degree of autonomy

Data

Data and analytics are the core capabilities of each component, driven by

- Digitization and integration of vertical and horizontal value chains — Industry 4.0 integrates processes vertically, across the entire organization, including processes in product development, manufacturing, structuring and service; horizontally, Industry 4.0 includes internal operations from suppliers to customers as well as all key value chain partners
- Digitization of product and services — integrating new methods of data collection and analysis—such as through the expansion of existing products or creation of new digitized products—helps companies to generate data on product use in order to refine products
- Digital business models and customer access — customer satisfaction is a perpetual, multi-stage process that requires modification in real-time to adapt to the changing needs of consumers

Smart factory

The Fourth Industrial Revolution fosters what has been called a "smart factory". Within modular structured smart factories, cyber-physical systems monitor physical processes, create a virtual copy of the physical world and make decentralized decisions. Over the internet of things, cyber-physical systems communicate and cooperate with each other and with humans in synchronic time both internally and across organizational services offered and used by participants of the value chain

Predictive maintenance

Industry 4.0 can also provide predictive maintenance, due to the use of technology and the IoT sensors. Predictive maintenance – which can identify maintenance issues in live – allows machine owners to perform cost-effective maintenance and determine it ahead of time before the machinery fails or gets damaged. For example, a company in LA could understand if a piece of equipment in Singapore is running at an abnormal speed or temperature. They could then decide whether it needs to be repaired.

Smart sensors

Sensors and instrumentation drive the central forces of innovation, not only for Industry 4.0, but also for other “smart” megatrends, such as smart production, smart mobility, smart homes, smart cities and smart factories.

Smart sensors are devices, which generate the data and allow further functionality from self-monitoring and self-configuration to condition monitoring of complex processes. With the capability of wireless communication, they reduce installation effort to a great extent and help realize a dense array of sensors.

The importance of sensors, measurement science, and smart evaluation for Industry 4.0 has been recognized and acknowledged by various experts and has already led to the statement “Industry 4.0: nothing goes without sensor systems

Scope of application:

Agriculture and food industry, Smart sensors in these two fields are still in the testing stage.

These innovative connected sensors collect, interpret and communicate the information available in the plots (leaf area, vegetation index, Chlorophyll, hygrometry, temperature, water potential, radiation). Based on this scientific data, the objective is to enable real-time monitoring via a smart phone with a range of advice that optimizes plot management in terms of results, time and costs. On the farm, these sensors can be used to detect crop stages and recommend inputs and treatments at the right time. As well as controlling the level of irrigation.

In the food industry: This industry requires more and more security and transparency and full documentation is required.

Today, IT has become a critical element for every business. A recent study Reveals that enterprises incur an average loss of \$72,000 for every single Minute of outage in IT services.

Some of the key aspects leading to an outage and business loss are:

- With increasing scale and complexity of enterprise data centers, IT Ops teams often find it difficult to understand application and infrastructure operational complexities and hence identify issues proactively. Silted IT operations lack the ability to provide a correlated enterprise-wide view across domains resulting in greater MTTR for incidents averaging 2.2 hours. Businesses employ an average of 6 employees to address each incident. This heavy reliance on people and tacit knowledge thereby increases the operational risk of human error

With huge volumes of data flowing into IT operations system, businesses are struggling to detect, diagnose and resolve critical issues and hence unable to meet their IT goals.

EFCS is a unique cognitive automation solution that judiciously blends intelligence and automation to transform the Enterprise IT Ops into a proactive, fast and reliable IT Ops.

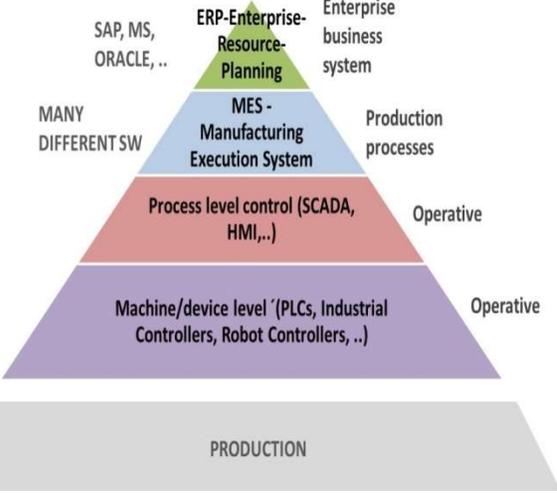
Key features and benefits

Builds a single source of truth for giving an end to end view of enterprise IT landscape

- Assimilates data from multiple Sources and combines it to construct a comprehensive blueprint
- Identifies and highlights areas that need attention with detailed reasoning and evidence proactively

Draws attention to just the right alerts at the right time

- Manages every aspect Of alert lifecycle such as alert prediction, detection, suppression, prioritization, and resolution
- Uses most advanced form of ML and AI for its forecasting and prioritization abilities respectively
- Eliminates up to 95% of alert noise



Why EFCS GSTD?
 Go-See-Think-Do, EFCS helps enterprise IT teams solve pain points, through the error, identify the source of problems, and fix it automatically. With EFCS, enterprises face no business disruption and no irate customers.

Objective Benefits



Improved business availability through **80-90%** reduction in operational risks & outages



Better end-user experience through **90%** reduction in time to perform activities



High ROI through **50-60%** of reduction in effort and cost

Finds root causes and heals incidents autonomously

- **Triage systematically to Identify the root causes of an incident**
- **Identifies and prescribes the best context-based action to fix the incident**
- **Industry leading feature that delivers closed-loop cognitive automation**
- **Reduces time to triage and fix Incidents by 90%**

Performs end-to-end activities readily

- **Automates all technology Lifecycle operation activities such as provisioning, commissioning, configuration, validate, backup & restore, and decommissioning**
- **Industry-leading model-driven advanced automation that can adapt itself to change**

- **Allows customization and extension of pre-built automation knowledge through developer studio**
- **Delivers quick ROI as it is equipped with a Comprehensive pre-built automation library for 30+ technologies across compute, network, and storage layers.**
- **Reduces up to 60% of manual Effort**

Meets enterprise needs

- **Scales horizontally to support expanding IT landscape**
- **Offers flexibility to upgrade capabilities to work with newer technology versions and newer technologies**
- **Supports internationalization**
- **Meets all kinds of security and safety needs**
- **Provides in built integrations to industry standard ITOM tool**

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EFCS™ an open, extensible platform that is specifically designed to optimize your time while helping you make Smart business decisions.

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