Industry 4.0

Topic: Industrial Internet of Things

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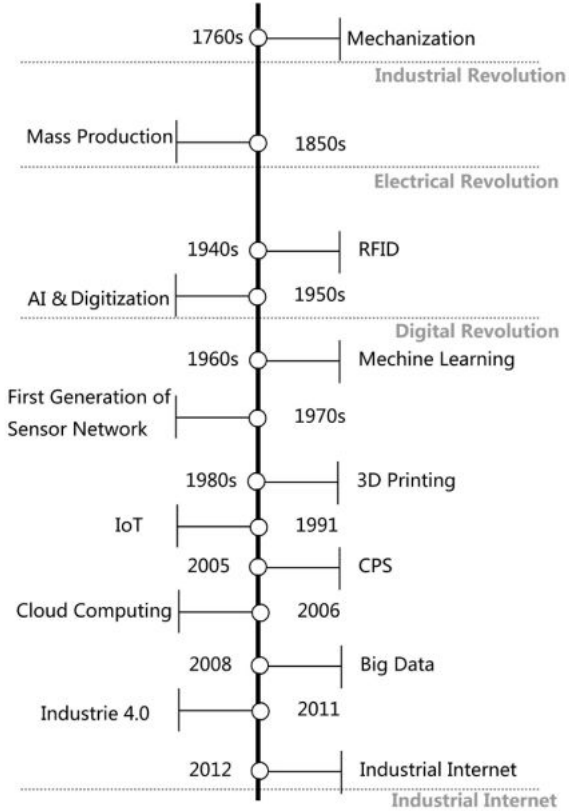
Introduction:

- In 2014, the Industrial Internet Consortium (IIC) was founded by AT&T, Cisco, Genral Electric, IBM and Intel, which sets benchmark for the Industrial Internet and promotes the development of the Industrial Internet.
- GE (General Electric) coined the name “ Industrial Internet ” as their term for the Industrial Internet of Things, and others such as Cisco termed it the Internet of Everything and others called it Internet 4.0 or other variants.



Timeline of key milestones of the Industrial Internet.

Industrial Internet

- As defined by GE, Industrial Internet is “the convergence of the global industrial systems with the power of advanced computing, analytics, low-cost sensing, and new levels of connectivity permitted by the Internet.”
- The interconnected devices in industries, automated assembly line, real-time data collected from sensor nodes, and their analysis together can be referred to as the Industrial Internet.
- It brings together the advances of two transformative revolutions: the myriad machines, facilities, fleets and networks that arose from the Industrial Revolution, and the more recent powerful advances in computing, information and communication systems brought to the fore by the Internet Revolution.


CPU
INDUSTRIAL
INTERNET
The convergence of the global industrial system with the power of advanced computing, analytics, low-cost sensing and new levels of connectivity permitted by the internet.
And with it, there's major transformation taking place in the industry.
#industrialinternet
http://www.geautomation.com/industrial-internet

- In the definition, the Industrial Internet is not entirely the same as the Industrial Internet of Things. After all, the global industrial system consists of many parts (including people, processes, information systems, infrastructure, all kinds of assets and also connected devices that are strictly not part of the Internet of Things as they don't use IP-based communications) and the Industrial Internet of Things piece is more in the dimensions of low-cost sensing and new levels of connectivity.

Elements behind the development of Industrial Internet:

- The three key elements of the Industrial Internet are:

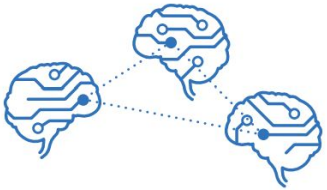
Intelligent machines, advanced analytics, and connected people

INTELLIGENT MACHINES

New ways of connecting the word's myriad of machines, facilities, fleets and networks with advanced sensors, controls and software applications.

ADVANCED ANALYTICS

Harnessing the power of physics-based analytics, predictive algorithms, automation and deep domain expertise in material science, electrical engineering and other key disciplines required to understand how machines and larger systems operate.



PEOPLE AT WORK

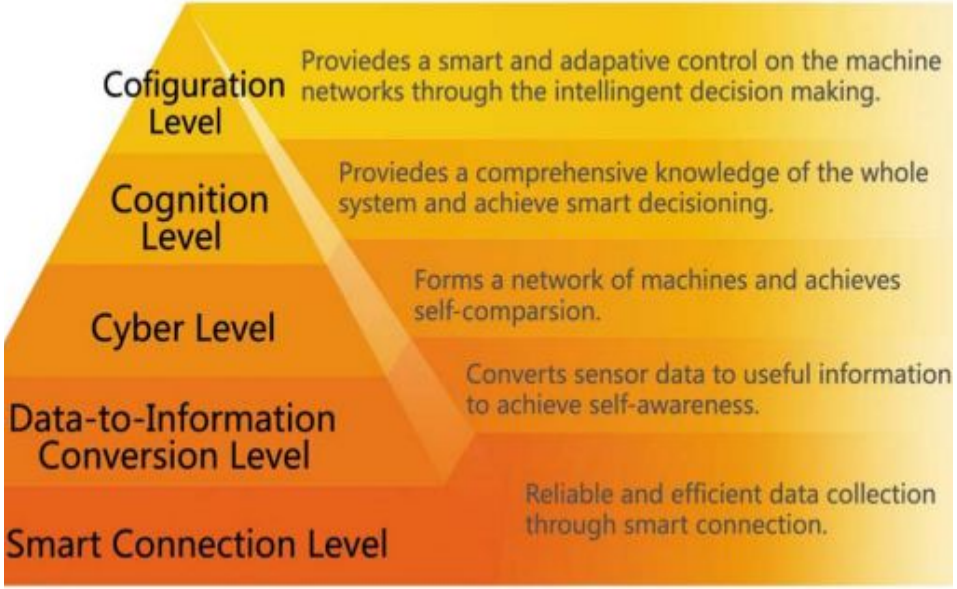
Connecting people, whether they be at work in industrial facilities, offices, hospitals or on the move, at any time to support more intelligent design, operations, maintenance as well as higher quality service and safety.

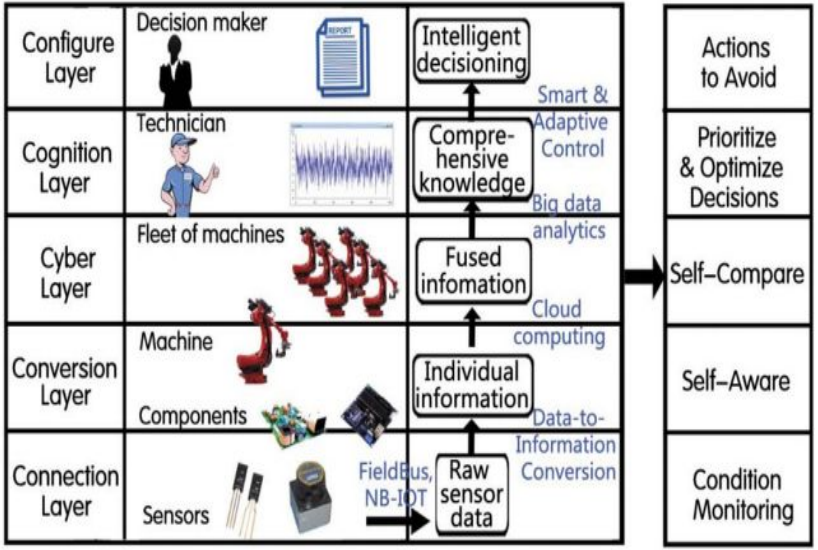
Catalysts behind the development of Industrial Internet:

- The investment in the deployment of sensor nodes, required instruments, business processes, and updated user application interfaces will promote the development of new technologies.
- The security of sensitive information, data, and intellectual property (IP) requires a robust security system.
- To instigate the growth of new talents such as advanced engineering studies, data scientists, and software experts promote industrial development.

ARCHITECTURE OF THE INDUSTRIAL INTERNET

- The Industrial Internet is generally understood as the application of CPS, generally adopted architecture is the unified 5-level architecture, namely the 5C architecture





Application of Industrial Internet:

- Aviation industry
- Transportation
- Healthcare
- Public Sector
- Power Production

Challenges in Industrial Internet

- Mixed Criticality
- Network Latency
- Fault Tolerance
- Scalability
- Functional Safety
- Security Challenge

References

- 1. Li, Jian-Qiang, et al. "Industrial internet: A survey on the enabling technologies, applications, and challenges." IEEE Communications Surveys & Tutorials 19.3 (2017): 1504-1526.
- https://www.i-scoop.eu/internet-of-things-iot/industrial-internet-things-iiot-saving-costs-innovation/industrial-internet/