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**Activity: Module 1 Lesson 1**

**Part 1.**

State your arguments or lesson learned relevant to the topic presented. I will supply the first item and you will continue the rest.

1. Physical and engineered systems whose operations are monitored, coordinated, controlled and integrated by a computing and communication core which is also known as Cyber Physical System is one of the four main components of Industry 4.0 according to the Literature Review of Hermann, Pentek and Otto.

2. One of the component of Industry 4.0 is the Internet of Things (Iot). According to Alexander S. Gills (n.d) The internet of things, or IoT, is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to computer interaction.

3. A smart factory is a highly digitized and connected production facility that relies on smart manufacturing the vision of a production environment in which production facilities and logistics systems are organized without human intervention according to Diann Daniel (n.d).

**Part 2**

Cite at least 3 example of technologies that belong to INDUSRTY 1.0 to 4.0 and briefly discuss its functionality.

INDUSTRY 1.0

1. **Steam power** - Instead of weaving looms powered by muscle, steam-engines could be used for power. Developments such as the steamship or (some 100 years later) the steam-powered locomotive brought about further massive changes because humans and goods could move great distances in fewer hours.

2. **Mechanization of production** - What before produced threads on simple spinning wheels, the mechanized version achieved eight times the volume in the same time in increasing human productivity.

3. **Waterpower** - A Roberts loom in a weaving shed in 1835. Textiles were the leading industry of the Industrial Revolution, and mechanized factories, powered by a central water wheel or steam engine

INDUSTRY 2.0

1. **Telephone**- The telephone had a huge impact on the communication during the industrial revolution because it lets you communicate much faster , lets you communicate with people in different countries and helps reduce many misunderstandings which lead to bad outcomes.

2. **Electric light/energy**- Electrical energy was already being used as a primary source of power. Electrical ma- chines were more efficient to operate and maintain, both in terms of cost and effort unlike the water and steam based machines which were comparatively inefficient and resource hungry.

3. Typewriter- With the typewriter it was much easier to spread news to more people faster, it was also less expensive, because you wouldn't need as much workers to pay. It had a great impact on both offices, and newspapers, and businesses.

INDUSTRY 3.0

1. **Programmable Logic Controller (PLC)**- that signified automation using electronics. The integration of electronics hardware into the manufacturing systems also created a requirement of software systems to enable these electronic devices, consequentially fueling the software development market as well.

2. **Computers** - the software or computer systems also enabled many management processes such as enterprise resource planning, inventory management, shipping logistics, and product flow scheduling and tracking throughout the factory. The entire industry was further automated using electronics and IT

3. **Robots - Industrial Robots Improve Speed and Quality.**

INDUSTRY 4.0

1. **cyber-physical production systems-** smart factories, in which production systems, components and people communicate via a network and production is nearly autonomous.

2. **Machines which can predict failures -** trigger maintenance processes autonomously or self-organized logistics which react to unexpected changes in production.

3. **Digitalization of manufacturing -** The digitalization of manufacturing will change the way that goods are made and distributed, and how products are serviced and refined.