



SRI KANYAKA PARAMESWARI ARTS & SCIENCE COLLEGE FOR WOMEN

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INDUSTRY 4.0

DEPARTMENT OF
COMPUTER APPLICATIONS

‘Industry 4.0’ stands for the fourth industrial revolution. Other related terms include the ‘Industrial Internet’ or the ‘Digital Factory’, although neither takes as complete a view. While Industry 3.0 focused on the automation of single machines and processes, Industry 4.0 focuses on the end-to-end digitization of all physical assets and integration into digital ecosystems with value chain partners. Industry 4.0 is used interchangeably with the fourth industrial revolution and represents a new stage in the organization and control of the industrial value chain. Cyber-physical systems form the basis of Industry 4.0 (e.g., ‘smart machines’). They use modern control systems, have embedded software systems and dispose of an Internet address to connect and be addressed via IoT (the Internet of Things). This way, products and means of production get networked and can ‘communicate’, enabling new ways of production, value creation, and real-time optimization. Cyber-physical systems create the capabilities needed for smart factories. These are the same capabilities we know from the Industrial IoT like remote monitoring or track and trace, to mention two. Industry 4.0 has been defined as “a name for the current trend of automation and data exchange in manufacturing technologies, including cyber-physical systems, the Internet of things, cloud computing and cognitive computing and creating the smart factory.

Evolution of Industry from 1.0 to 4.0

There are four distinct industrial revolutions that the world either has experienced or continues to experience today.

The First Industrial Revolution:

The first industrial revolution happened between the late 1700s and early 1800s. During this period of time, manufacturing evolved from focusing on manual labor performed by people.

The Second Industrial Revolution:

In the early part of the 20th century, the world entered a second industrial revolution with the introduction of steel and use of electricity in factories. The introduction of electricity enabled manufactures to increase efficiency and helped make factory machinery more mobile.

The Third Industrial Revolution:

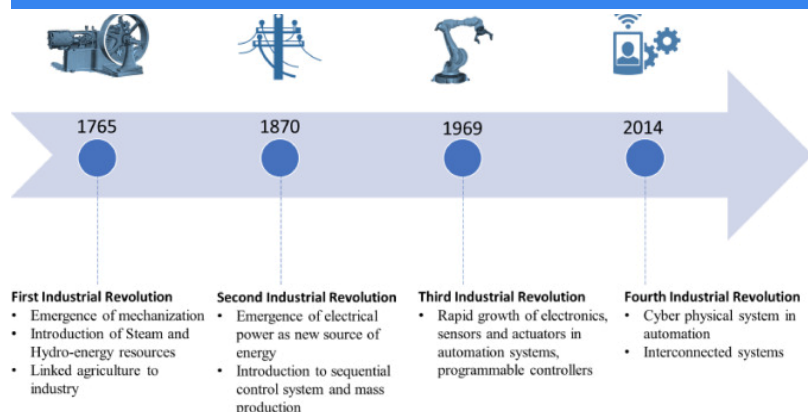
Starting in the late 1950s, a third industrial revolution slowly began to emerge, as manufactures began incorporating more electronic and eventually computer technology into their factories. Less emphasis on analog and mechanical technology and more on digital technology and automation software.

The Fourth Industrial Revolution, or Industry 4.0:

In the past few decades, a fourth industrial revolution has emerged, known as Industry 4.0. Industry 4.0 takes the emphasis on digital technology from recent decades to a whole new level with the help of interconnectivity through the Internet of Things (IoT), access to real-time data, and the introduction of cyber-physical systems. It connects physical with digital, and allows for better collaboration and access across departments, partners, vendors, product, and people. Industry 4.0 empowers business owners to better control and understand every aspect of their operation, and allows them to leverage instant data to boost productivity, improve processes, and drive growth.

-H.AFRAAH SAEEDA FATHIMA I BCA

HISTORY OF INDUSTRY 4.0



INDUSTRY 4.0

TECHNOLOGICAL PILLARS

Big Data and Data analytics:

Data analytics, once an IT application is now penetrating into manufacturing and supply chain industry. This is cost-efficient and safer than the conventional routine maintenance method.

Horizontal and Vertical Integration:

Horizontal integration takes networking among the cyber-physical systems and enterprise systems to an unprecedented level. Vertical integration makes it even better.

Industrial Internet of Things:

An ecosystem in which all the sensors and actuators with the ability to function separately and communicate with every other element is called IOT. Industrial IOT is the same but with increased ruggedness to survive the harsh environments of the industry.

Autonomous Robots:

Autonomous robots transfer raw materials, half-finished and completed goods in an easier, faster and smarter way. They operate based on a complex logic algorithm, meaning they don't require any preset path to carry out their duties. These robots catalyze the manufacturing process.

The Cloud:

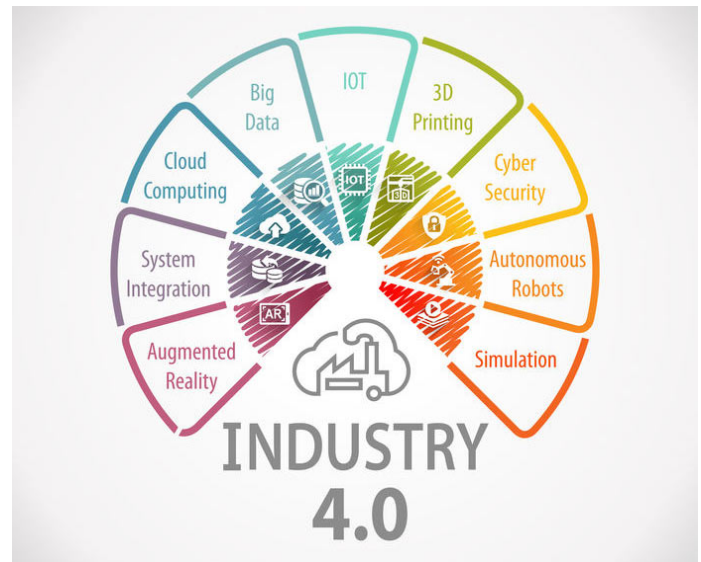
Cloud is a remote system that can be accessed provided from anywhere using the internet. There are a lot of cloud services available today of which notable are IaaS, PaaS, SaaS.

Cyber Security in Industry 4.0:

Cyber security becomes the talk of the town since the dawn of Information technology. The greatest nightmare of any information technology firm is having their server and data hacked. Connectivity makes the system vulnerable to anyone in the same network to access the designs.

Additive Manufacturing and 3D Printing:

Companies are already using additive manufacturing techniques like 3D-printing to make prototypes and Proof of concepts.



THOUGHTS:

Industry 4.0 is definitely a revolutionary approach to manufacturing techniques. The concept will push global manufacturers to a new level of optimization and productivity. Not only that, but customers will also enjoy a new level of personally customized products that may have never been available before.

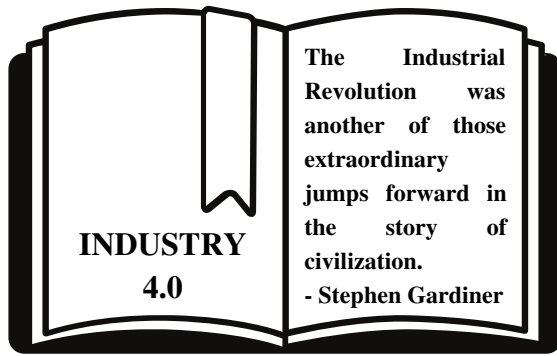


If you go back to 1800, everybody was poor. I mean everybody. The Industrial Revolution kicked in, and a lot of countries benefited, but by no means everyone.


- Bill Gates

BENEFITS OF INDUSTRY 4.0



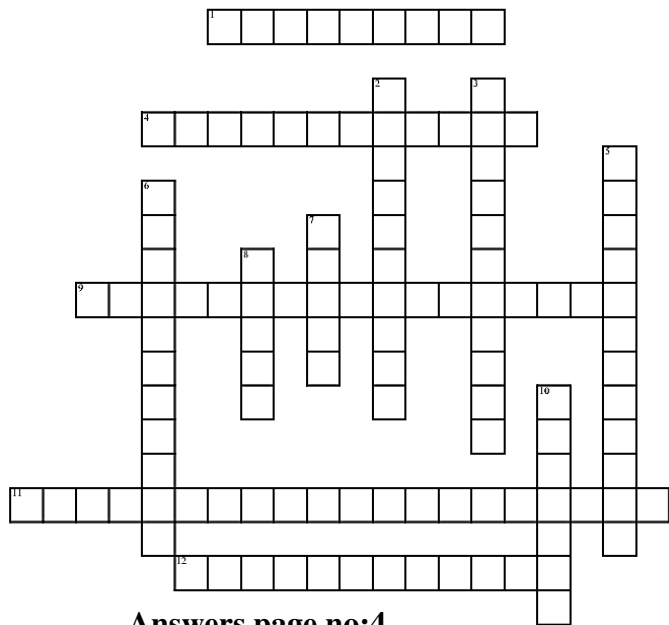


ROBOTICS IN THE AGE OF INDUSTRY 4.0



Robots are an important piece of the Industry 4.0 puzzle. Artificial intelligence (AI), cloud computing and data analytics will also make industrial robots more reliable than ever. The goal of Industry 4.0-enabled robotics is zero downtime and maximum efficiency.

CROSSWORD



Answers page no:4

Across:

1. Wealthy landowners enclosed farms with hedges and fences and conducted experiments
4. Farmers planted crops to restore the nutrients to soil
9. The development of industries for the machine production of goods
11. Increased output of machine made goods.
12. A person who managers, organizes and takes on risk of a business

Down:

2. Is an economic system in which the factors of production are privately owned
3. Is a business owned by stockholders
5. The growth of cities and the migration of people into them
6. A social class made up of skilled workers, professionals, business people, and wealthy farmers
7. Workers joined together in voluntary labor associations
8. Selling away ownership of company or parts for money.
10. A large building in which machinery is used to manufacture goods factory

MERITS

- ➔It is easy to do backend integration with ERP/MES etc.
- ➔It is possible to host micro services.
- ➔It enables execution of transactions with soft real time.
- ➔It enables simple distribution of functionalities to multiple nodes.
- ➔Clear and monitored communication paths in industry 4.0 makes resource management very simple.
- ➔It is easy to add new protocols and processes.

DEMERITS

- ➔The IoT security is a major concern. The companies are working to address the security related loop holes.
- ➔Skills and education of workers working on industry 4.0 based processes need to improved.
- ➔Need to eliminate any IT snags as this will cause costly production outages.
- ➔Reliability and stability are required for M2M (Machine to Machine) communication. This demands very short and stable latency timings in the system.
- ➔It requires to maintain integrity of production processes.
- ➔It requires to educate staff to adopt this 4th industrial revolution.

WORD SEARCH

A P M O N G U Z R U S B V C O H I N M Z Z F H S
 H P O B M C B M E R Y U A A B C M I A V I C A S
 Q R Y T T I D S P B O J U P B B T G K R X K O R
 T K S Z C N R P A A N I C I L E P N R W R U U D
 L S E O U D Q X E N G J J T L Q A O X U Q X R C
 O H V Z R U D N R I E V W A E Q H T G D F U B Q
 R D B Q J S R O L Z M B V L W A G T Z W P V C I
 R J E B P T E I A A N C K I O K B O J K M G P I
 I H X V D R T T C T T H N S L F S C Z C M M L O
 C A R P U I A C I I O N H T T P O R C H S A C W
 H R Y M K A L U N O S K K R O F E F M X U O D C
 A D P D H L S D A N J I M O B Q G D R T O O L D
 R W E T A R L O H K E K B U A I K T E X T I L E
 D W I I V E E R C C L H I M C Y O I E F U B L V
 A U Y J O V U P E A I P K L S C L M G V N B G C
 R Z T J F O M S M P W C D C I L W F V R E L G Y
 K V Q W B L A S P I H T Y W C T E L E G R A P H
 W B Y I B U S A H T I U T X N I N V E S T M W Z
 R B M V V T L M O A T Y Y Q A F R O I R E F N I
 I T O W I I F W H L N U S N R Q V F H Z Y W O R
 G E O D C O I M K J E R Z S F T N E I C I F F E
 H E J N A N Q O M V Y M E T S Y S Y R O T C A F
 T G I N T E R C H A N G E A B L E P A R T S T T
 N G I E R O R V N O I T A N I M I R C S E D S G

urbanization	cash crop	Eli Whitney	Francis Cabot Lowe
Samuel Slater	Richard Arkwright	textile	cotton gin
mechanical reaper	discrimination	telegraph	interchangeable par
mass production	capital	capitalist	factory system
industrial revolution	inferior	reign	efficient
invest			



Everyone is talking about it, so the converting process towards Industry 4.0 deserves to be understood in depth.

CROSSWORD ANSWERS

ACROSS:

1. Enclosure
4. Crop Rotation
9. Industrialization
11. Industrial Revolution
12. Entrepreneur

DOWN:

2. Capitalism
3. Corporation
5. Urbanization
6. Middle class
7. Union
8. Stock
10. Factory

FACTS ABOUT INDUSTRY 4.0

FACT#1: Industry 4.0 is a valuable tool in product customization.

FACT#2: Industry 4.0 helps drive, develop, and push post modern ERP.

Fact #3: Industry 4.0 means a greater integration with Cloud technology.

FACT#4: Industry 4.0 analytics walk hand-in-hand in creating planning and production efficiencies.

-DHANUSRI R I BCA

TOP 5 INDUSTRIES IN INDUSTRY 4.0

- Hosting: Microsoft
- Analytics: Uptake
- Microchips: Nvidia
- Sensors: Festo
- Connectivity Hardware: HMS

CONCLUSION

Industry 4.0 is the result of a tipping point in technology innovation. The IoT, cloud, big data, and more is pushing industry 4.0 forward. This industry promises to change the way business is done. Business models will be redefined, more processes will become automated, and organization will optimize their value chain even further.

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