Applications of Computing in Manufacturing Industry

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OBJECTIVES

FOLDER 01

STUDENTS ARE EXPECTED TO LEARN AND IDENTIFY THE FOLLOWING:

- WHAT IS MANUFACTURING INDUSTRY
- CONTRIBUTION OF COMPUTING IN MANUFACTURING
- ADVANTAGES AND DISADVANTAGES

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FOLDER 02

Applications of Computing in Manufacturing Industry

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TOPIC

FOLDER 03

WHAT IS MANFACTURING INDUSTRY

The term manufacturing industry relates to those parts of the economy which produce goods through changing unprocessed materials into completed items by means of different methods including machines, human effort as well as chemical or physical treatments.

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FOLDER 03

Computing Technology

Computing technology refers to the machines and systems used in the field of computer science to process, store, communicate, manipulate, and compute data. It is in the form of computers, tablets, web, cloud computing, and social media.

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FOLDER 04

Automation and Robotics:

- Through the control of machines performing repetitive tasks fast and precisely, computing has been used to revolutionize manufacturing through automation and robotics. Errors are reduced, efficiency is increased, continuous production is enabled hence making assembly lines and quality control faster and reliable.

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FOLDER 04

Internet of Things (IoT)

- The internet of things is revolutionizing the manufacturing industry, leading to the transformations in its efficiency, quality and productivity. It enables real-time tracking of production which makes it easy for manufacturers to reduce idle periods, determine when maintenance is required and improve on quality by means of continuous defect detection. Besides, it strengthens supply chain visibility, thus giving producers an edge over their competitors in the market.

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FOLDER 04

Computer-Aided Design (CAD):

- Computing enables the creation of digital models and simulations, facilitating faster and more accurate product design.

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FOLDER 04

Additive Manufacturing/3D Printing

- Additive manufacturing, also known as 3D printing, is a faster and more efficient method of creating goods from 3D models using materials like plastics (polymers), metals, and concrete. It is widely used in fields like aerospace, medical prototyping, consumer goods, and automotive.

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ADVANTAGES AND DISADVANTAGES

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ADVANTAGES

FOLDER 05

The implementation of innovative technologies can improve the way businesses in the manufacturing sector operate.

- Increase the efficiency of your business systems
- Cost reduction
- Increase the speed, flexibility and efficiency of the production process
- Expand the range of what can be produced
- Improved quality assurance

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DISADVANTAGES

FOLDER 06

The manufacturing industry, while vital for economic growth, can have significant environmental consequences. Furthermore, automation and globalization can lead to job displacement and unfair working conditions for employees in the sector.

- Environmental impacts (Pollution, Depletion of natural resources, Waste generation)
- Social impacts (Job Losses, Health Problems, Unequal working conditions)
- Machine breakdowns
- Lessen the productivity

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OVERVIEW

FOLDER 07

Impact of Computing Technology on Manufacturing:

- Increases efficiency, precision, and automation.

Key Contributions:

- Automation and robotics
- Internet of Things (IoT)
- Computer-Aided Design (CAD)
- Additive Manufacturing / 3D Printing

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FOLDER 07

Benefits:

- Higher productivity
- Cost savings
- Improved business efficiency
- Enhanced quality assurance

Drawbacks:

- Environmental impact
- Economic challenges
- Human implications

Conclusion:

- Despite drawbacks, computing technology is essential for innovation and competitiveness in manufacturing.
- Manufacturers rely on it, and interest will grow as technology advances.

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CONCLUSION

- Computing technology has revolutionized the manufacturing industry by increasing efficiency, precision, and automation. Its major contributions include automation and robotics, the internet of things (IoT), computer-aided design, and additive manufacturing/3D printing.
- The benefits include higher productivity, cost savings, increased efficiency of business systems, and improved quality assurance. However, there are always some drawbacks that businesses must consider while implementing advanced computing technology in their industry. These include substantial environmental, and human implications within the manufacturing industry. Despite these disadvantages, computing technology is still critical for driving innovation and competitiveness in manufacturing. Manufacturers have become dependent on it, and as technology advances, they will become increasingly interested in using it in the manufacturing industry.

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FOLDER 101

GROUP 4

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THANK YOU