A Review Paper on Industry "4.0" and Advance manufacturing with implementation of Automated and Intelligent Technique.

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ABSTRACT

This review paper primarily focused on the industry 4.0 and Advance manufacturing and basics of artificial intelligence in Industries. The Role of advance manufacturing technology and artificial intelligence in the industry "4.0". This paper focuses on the fundamental conception of Industry 4.0 and the state of current manufacturing systems. The purpose of the implementation of advance manufacturing processes and modern techniques is to atomise the industry to reduce the waste and make the process more efficient. A new manufacturing techniques is emerging, which can be characterized by two unique features: integrated manufacturing and intelligent manufacturing. The objective is to provide an overview of the Industry 4.0 and smart manufacturing programs.

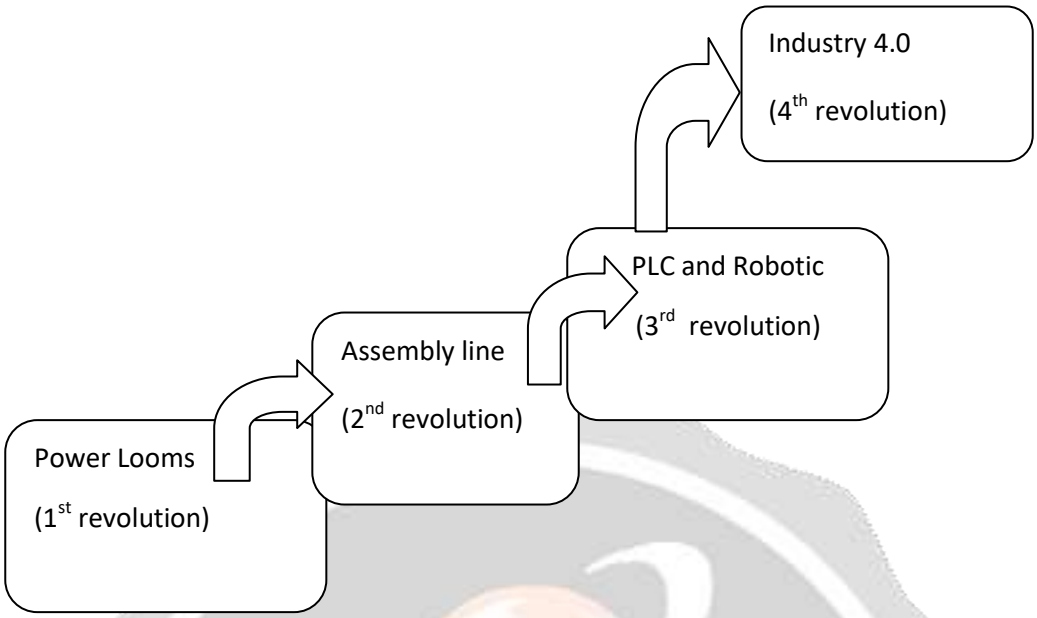
Keyword: - *:- Industry "4.0" , Advance Manufacturing , Artificial intelligence, intelligent manufacturing.*

1. INTRODUCTION

To compete in future markets, manufacturing companies should be able to produce small batch sizes of a product or even a single item in a timely and cost-effective manner, and they should have sufficient functionality, scalability, and connectivity with customers and suppliers to meet these requirements.[2] In addition, to meet such challenges, systems will become more complex and difficult to monitor and control. Traditional manufacturing systems (flexible manufacturing systems, dedicated production lines, etc.) will be unable to compete in future markets[4] Many technologies have recently appeared, the use of an advanced manufacturing technology (AMT) is one alternative for a small firm to remain competitive. An AMT can provide it with the tools and techniques required to accommodate the increasing demands of its customers.[1] Industry 4.0 has emerged as a new industrialization concept that explores these new technologies to cope with the challenges. The smart factory is the heart of Industry 4.0[3].The smart factory integrates these technologies to improve performance, quality, controllability, and transparency of manufacturing processes.[1]To get more advance and the effective process the manufacturing technology trend and of the two unique features of integrated manufacturing and intelligent manufacturing.

2. INDUSTRY "4.0"

INDUSTRY "4.0"defined I4.0 as "the fourth industrial revolution applying the principles of cyber-physical systems (CPS), Internet and future-oriented technologies and smart systems with enhanced human-machine interaction paradigms". Germany which has one of the most competitive manufacturing industries in the world and a strong machinery and plant fabrication, therefore it is important to master the challenges of a fourth industrial revolution. Hence the concept of industry "4.0" come into existence in German based industries and in the world too.[11]In the industry "4.0" is characterized by introducing the things which is done by the use internet, means internet of the things **(IOT).**In smart factories the production systems were integrated horizontally and vertically. The machines which are self-determined through items delivering their own production data to intelligent machines, which are aware of the environment, exchange information, and control processes in production.[7]



3 . ATIFICIAL INTELLIGENCE

According to the father of Artificial Intelligence, 'John McCarthy, it is "The science and engineering of making intelligent machine, especially intelligent programs".

Artificial Intelligence is a way of making a computer, a computer-controlled robot, or a software think intelligently, in the similar manner the intelligent humans think.

Artificial Intelligence is accomplished by studying how human brain thinks, and how human learn, decide, and work while trying to solve a problem, and then using the outcome of this study as a basis of developing intelligent software and system.

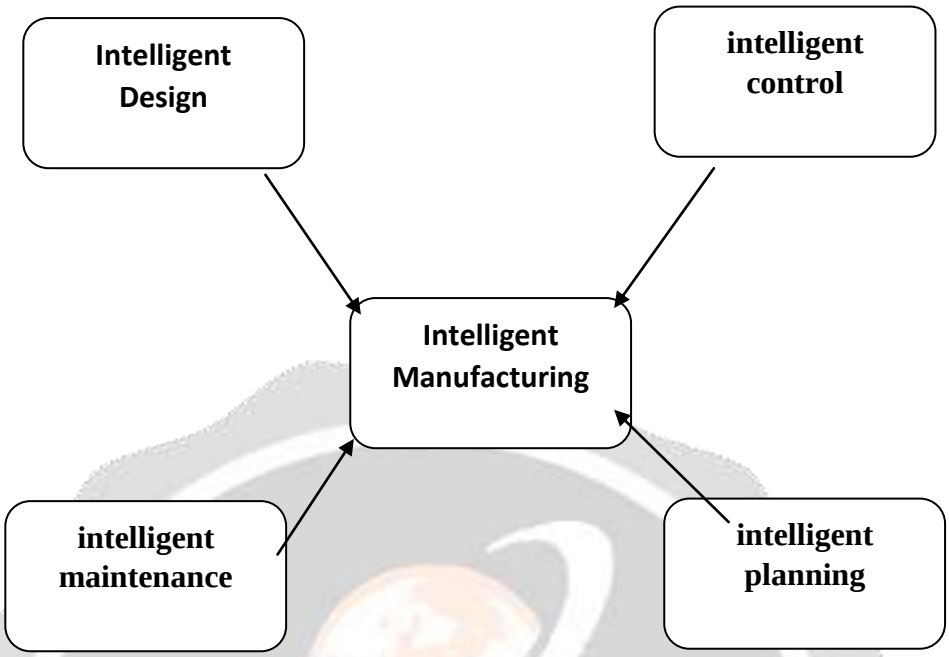
The purpose of AI is to make the expert system which exhibit intelligent behaviour, learn, demonstrate, explain, and advice its user. To implement Human Intelligence in machine – creating system that understand, think, learn, and behave like human.[5]

The main purpose of artificial intelligence is HOW TO MAKE MACHINE MORE AND MORE INTELLIGENT AS HUMANS.[10]

4. INTELLIGENT MANUFACTURING

Intelligent manufacturing means using the combine intelligence of people, processes and machines to impact the overall economics of manufacturing. Its purpose is to optimise the manufacturing resources, improve business value and safety, and reduce waste both on the floor and in that office operations, all while meeting costumer demand for delivery and quality. Manufacturer achieve this with the latest ,manufacturing executions system, intelligent device, machine to machine devisees and data analysis for its productions line and facilities.

The intelligent manufacturing system requires • intelligent design, • intelligent operation, • intelligent control, • intelligent planning • intelligent maintenance.[6]



5. ADVANCE MANUFACTURING TECHNOLOGY (AMT)

In finding ways to increase competitiveness and productivity, the use of an advanced manufacturing technology (AMT) is one alternative for a small firm to become or remain competitive. An AMT can provide it with the tools and techniques required to accommodate the increasing demands of its customers. It enhances a firm's ability to simultaneously lower costs, increase quality, and provide rapid delivery of customized products, and therefore has become the cornerstone of many new manufacturing strategies.[1,8]

5.1 Design Principle of Advance Manufacturing Technique And Smart Factory

1.Modularity 3. Decentralization 5. Service orientation
2.Interoperability 4. Virtualization 6. Real-time capability (responsiveness)[8]

6. CONCLUSIONS

In this paper, we focus on new trends in the manufacturing field, particularly the vision of Industry 4.0, which will revolutionize manufacturing systems. By the industry 4.0 In future we may have various modern techniques which were gifted by advanced technology to improve the productivity and more efficient any safe and clean way of manufacturing

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