A BRIEF OVERVIEW OF INDUSTRY 4.0

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ABSTRACT

In this paper, a brief overview of Industry 4.0 is discussed. The manufacturing industries are changing from mass production to customized production as per the business requirement. The latest advancements in manufacturing field and applications in the industries help in improving productivity. Industry 4.0 stands for the 4th technological revolution, it is defined as the replacement level of organization and control over the whole value chain of the life of cycle of a product; it is inclined towards the rising individualized customer requirements. Industry 4.0 remains visionary but a sensible concept which consists of new technologies such as internet of things, industrial internet, smart manufacturing and cloud based Manufacturing. Industry 4.0 concerns the strict integration of human within the manufacturing process so on have continuous improvement and specialize in value adding activities and avoiding wastes.

Keyword: *Industry 4.0, technologies, internet of things, manufacturing, integration.*

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1. INTRODUCTION

Today very topical issue among the main competitors within the global industry is titled Industry 4.0. As per all the indications (developing machines, computer software, robotics, etc.) global business networks will soon appear. It will consists of "smart" machines, storage systems and manufacturing facilities in form of cyber-physical production system (CPS). This type of production system will automatically exchange information, initiate activities and independently perform control. The fourth technological revolution is predicated on the concept of smart factory. Smart factories have completely new approach to the assembly. The smart products can be identified and located easily. Their history, current state and future activities that are necessary to urge the ultimate look can be known in real-time. Well prepared database is extremely important because it's necessary to filter the specified reports so as to receive timely and useful information. Advantages of the virtual world are used because virtual world provides the simulation of various cases. Optimization of products, processes and therefore the entire supply chain are continuously improved. There are trusted-cloud based networks (Cloud technology). Cloud technology provides “smart” data centers, services and applications so users (companies) are able to do lower costs and operational efficiency. The new approach allows production consistent with the individual customer requirements. Today many companies have moved far away from production to mass customization production. The main goal is to possess a production system which will support any dynamic business processes. Such system are having flexibility. [3]

Industry 4.0 was first explained in 2011 in Germany which consisted of initiative of the federal government with universities and private companies. It was a program to develop and build advance production systems with the

objective of improving productivity and efficiency of the industry. The concept of Industry 4.0 consists of a new industrial stage of the manufacturing systems by combining series of new emerging technologies that add value to the whole product as well as its lifecycle. The new age industries demands a newer version industrial evolution and also the human role in production systems. In this concept, all working activities of the value chain will be performed with smart approaches and with the help of information and communication technologies (ICTs). The root of Industry 4.0 lies in the advanced manufacturing or also called as smart manufacturing concept. It is an adaptable system which is autonomous and the flexible lines adjust automatically as per the production processes for multiple types of products and their changing conditions. This allows to increase quality, productivity and flexibility and can help to achieve customized products at a large scale and in a sustainable way with better resource consumption [5].

Features of Industry 4.0 are horizontal, vertical and digital integration of the whole system. Key areas are standardization the management of complex systems, a comprehensive infrastructure security and privacy, work organization and design legal framework and the effective use of resources. It is important that managers at companies understand the industry 4.0 and the way it's actually. By finding an appropriate model, with strong support of development, a vision and path to Industry 4.0, which is restricted to a plant, are often created. The concept of Industry 4.0 must be integrated with specific areas of concern of factory. It is necessary to seek out areas of activities and make a step further towards the Industry 4.0. Potential problem might be the priority areas of action. The introduction and use of latest technologies doesn't mean certain thanks to Industry 4.0, because it might be a really narrow approach. The system won't function properly if there's advanced technology and outdated organization. There are several business models and possible strategies to enhance the assembly systems [3].

Table-1: Different Industrial Revolutions

First Industrial Revolution consisted of Water and Steam Power Engine	1784
Second Industrial Revolution came up with Mass Production using Electrical Energy	1870
Third Industrial Revolution saw the use of PLC and IT system in Automation	1970
Fourth Industrial Revolution consists of use of IoT and CPS	Current

1.1 Need of Industry 4.0

The need of Industry 4.0 is to convert the regular machines to autonomous, self-apprehensive and self- learning machines to boost their overall performance and conservation operation with the ongoing operation industry 4.0 aims at the construction of an open, smart manufacturing platform for artificial networked information operation. The main requirements of Industry 4.0 are: real time data monitoring, tracking the status and positions of product as well as to hold the instructions to control product processes [2].

2 LITERATURE REVIEW

The authors have examined Industry 4.0 technologies in terms of application and sustainability implications. They have introduced a measure framework for sustainability based on the sustainable development goals; incorporating various economic, environmental and social attributes [1].The authors have explained overview of Industry 4.0 and the 9 pillars of it with suitable applications. They have identified the challenges and the issues arising with implementation of Industry 4.0 [2]. In this paper, authors have provides an overview of several concepts and strategies. Various strategies and concepts from literature are compared in order to find the field of area that are not covered yet [3]. In the paper, the authors have briefly surveyed the state of the art in the area of Industry 4.0 as it relates to industries [4]. The authors have aimed to understand the adoption patterns of Industry 4.0 technologies in manufacturing firms and have proposed a conceptual framework for these technologies, which is divided into front-end and base technologies [5].

3 BENEFITS OF INDUSTRY 4.0

1. Higher productivity and better efficiency:

Industry 4.0 helps you do more with lower efforts. This means a briskly product process that uses lower raw accoutrements and product coffers to supply further while keeping the prices down. As the mortal input is minimum and machines have enhanced covering systems, the smart manufactories enjoy lower time-out, because preventative conservation are frequently done at the proper moment. It also helps to detect any product- related problems in real time and break them with acceptable data in hand.

2. Reduced costs

The original investments for enforcing Assiduity4.0 results are substantial but change doesn't be overnight or on its own. Still, when transition to a smart plant has been made, in addition to better productivity you'll be suitable to see a considerable cost reduction.

3. Advanced quality and better client experience

In addition to the enhanced product capabilities of smart manufactories, they also hold the key to better client experience. Assiduity4.0 enables to apply results for better product shadowing to identify problematic products and snappily find out the reasons behind the blights.

4. Increased profitability

We've covered advanced quality and effectiveness, better costs and better client experience, which all add up to better profitability. In addition to that, smart manufactories enable businesses to develop new and innovative products vastly briskly, and indeed offer guests personalised products.

5. Personalized products

Industry 4.0 is a way to move down from mass product and towards further individualized products. Some indeed say that the position of customization resembles crafts manufacturing. The several artificial revolutions led us to a product process where we could produce thousands of identical products briskly, with advanced quality and more efficiently. But every customization meant that some of the ministry or indeed the whole plant demanded to be set up consequently – which caused precious time-out.

4 LIMITATIONS OF INDUSTRY 4.0

1. High Costs:

Not only is technology a major cost to consider, but the moxie in enabling the technology to be enforced. Having the know- style in newer fields like IoT, Augmented Reality, and AI can lead to major budget constraints, not to mention a lack of understanding among all parties involved.

2. High Rate of Failure:

The difficulty in launching Industry 4.0 enterprise is that there's frequently a lack of direction when it comes to establishing objects. They're frequently cross-functional systems with numerous stakeholders, which can mean systems can come mired in clashing pretensions, and may simply chat out.

3. Cyber security:

People, products, and outfit is, and will decreasingly be, connected to the internet. Although this gives us lesser access to data via the pall, it opens up openings for hackers to pierce networks.

4. Need for Skilled Labour:

Manufacturing and Industries as a whole, continues to calculate on humans to enable product. Still, with the move to digitally connected systems, there's a lesser need for largely professed labour, which may unintentionally reduce the need for low- skill labour.

5. Industry and market disruption:

With new technologies available, being results will ultimately be phased out. Analogous to the Blockbusters of the world, certain diligence will be unfit to survive what Industry 4.0 brings to vend.

CONCLUSION

The paper substantially concentrated on the conception of fourth industrial revolution, called Industry 4.0 which allows smart, effective, effective, personalized and tailored product at reasonable cost. Various components such as faster computers, smarter machines, detectors, data storehouse and transmission could make the machines and products smarter to communicate with each and learn from each other. With the help of the developing technologies, Industry 4.0 will have a lot of scope in future. The data is collected from the product lines and optimization of that data for the further use of effective machines, Energy Saving and Optimized conservation scheduling can be done using the data.

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