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How Can Industry 4.0 Boost Indian Manufacturing Sector?

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ABSTRACT
Industry 4.0 is a smarter way towards manufacturing. It increases efficiency on the manufacturing line in as much as it creates accountability of business right from the product prototype development to final roll out and then all through the supply chain. Developed nations have already understood its importance and drawing benefits from it in almost all manufacturing sectors and India has just woken up to the promises and challenges that Industry 4.0 offers to the nation's third largest manufacturing commitment that it has to the world. This paper provides an overview of Industry 4.0, its relevance to the Indian manufacturing sector and how can it deliver what it has delivered elsewhere in the world.

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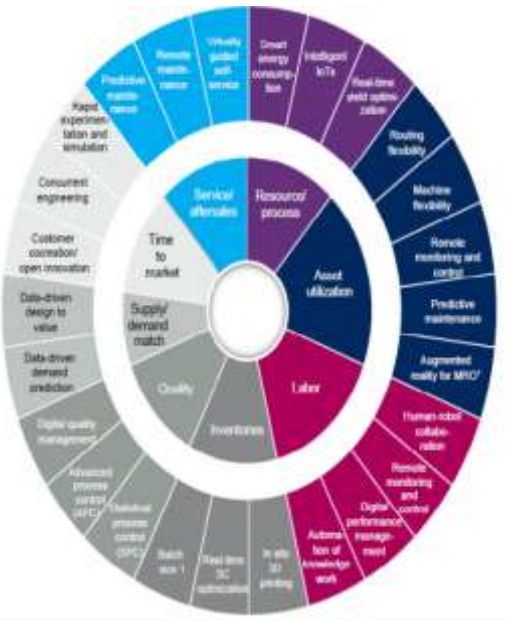
I. INTRODUCTION

Industry 4.0 can be termed as the world's 4th industrial revolution. Industry 4.0 helps manufacturing industry increase efficiency, reduce costs, and create 'smarter' products by employing automated procedures resulting from the seamless coordination between humans and machines, which are powered and guided by several digital systems. Industry 4.0 is a smart factory concept in which digital systems networked with each other and other processes of the factories to provide precision commands to semi-finished products, raw materials, robots, machines, tool, and men. This coordination between all of them leads to flexibility, correct use of resources, and integration of business partners, processes and customers (Intralogistics, 2014).

Industry 4.0 can, in other ways, be termed as a networked factory, in which men and machines work in coordination with each other. It does not only lead to higher levels of artificial intelligence than men of previous generation but also machines and robots of previous generation too. Germany is a classic example of this coordination (Hattermann, 2016).

This has led to the unimaginable changes in the business models that were previously employed by industries, including the manufacturing sector (Arnold, 2016). At the core of these changes are hardware and software, which translate given data sets and commands into actionable processes that result in smart production. The smartness in the production line is such that the entire life cycle of a product is influenced. Before Industry 4.0 this was not possible as digital intervention was either not present or was totally minimal. Industry 4.0 has made it possible to test 3D prototype of a product many times and long before the actual product is finally mounted on the assembly line (Bock, 2017). Now processes like logistics, supply chain management and product control can be rehearsed long before the actual products are made (Hermann, 2016).

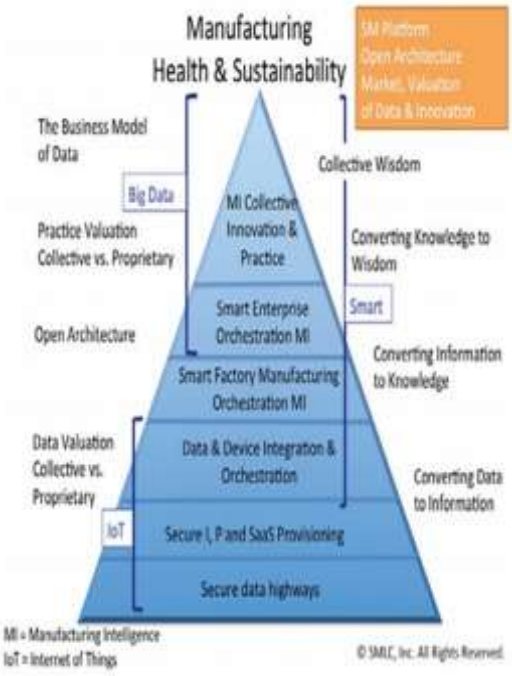


Source: McKinsey (http://portal.sinteza.singidunum.ac.rs/Media/files/2016/293-298.pdf)

The McKinsey Digital Compass lists 8 main value drivers on Industry 4.0 map and also its corresponding effects on increased productivity, cost reduction; reduction in time to market, forecasting accuracy, reduction in total machine downtime, reduction is costs incurred on quality, and increase in productivity in technical professions.

Relevance to Manufacturing Sector

Industry 4.0 is transforming manufacturing sector like never before. Its applicability has come to be established in every other field of manufacturing now, which includes advanced manufacturing systems, autonomous vehicles, additive manufacturing, industrial mobile devices, logistics, and sensors used in manufacturing industry for data collection. As mentioned above, it has heralded modern industry into a period of smart manufacturing by using more than one determinants in the act, like Internet of Things (Winnig, 2016), Big Data (Hartmann. 2016), and machine precision, as given in the pyramid below.



Source: Dr. Jay Lee, Behrad Baghery, Hung Ann Kao, Edzel Lapira, Manufacturing leadership journal, February 2015, Industry 4.0 and Manufacturing Transformation, 31.03.2016. http://www.mljournal-digital.com/meleadershipjournal/201502?search_term=Industry%204.0&doc_id=-1&search_term=Industry%204.0&pg=48#pg48

Relevance to Indian Manufacturing Sector

By and large Indian manufacturing sector is divided into two types - unregistered and registered. Small scale industrial units on account of several factors are not able to keep pace with the state-of-the-art (Spieth, 2014) technological processes industrial units which give the country top-notch products try to keep abreast with modern technological advances. Industry 4.0 is one of their top priorities.

Ever since liberalization, India has slowly and slowly begun to be recognized as the promising hub of manufacturing sector. Except for the pace of reforms which was termed as "slow" by International Monetary Fund (IMF) some years back, recent decisions by the union government - ease of doing business and GST being two of many

- the manufacturing sector in India is now poised for a new growth.

The manufacturing sector in the country has now attracted a new focus and concerted efforts are being made by the union and the state governments to boost a rise in sectors like machinery, automobile, pharmaceutical, aviation, and electronic and semiconductor. Foreign investors are now looking keenly at India as their next manufacturing destination on account of reduced cost of labor and competitive prices. Given that the nation draws salient features of Industry 4.0 into its manufacturing, India will have a lot to offer to the world in manufacturing sector (Iyer et al, 2011).

How Can Industry 4.0 Help?

India manufacturing sector has been known for not meeting customer demands in time, and, in reality, a very casual approach towards time management and commitments. Industry 4.0 helps overcome that. It ensures in-time manufacturing and provides a boost to increased productivity by proper utilization of relevant technologies (Fettermann, 2018).

Industry 4.0 is not only able to influence operations management but also every second product development stage. This is because the cyber-physical interface of Industry 4.0 precisely knows the requirements of the manufacturing that the product needs to be given. The system is made so adaptable to pre-defined commands that it leaves no scope for error, unless for a technical glitch. Industry 4.0 ensures that the product follows a unique command configured for its development. Right from the conceptualization stage to the final roll out of the product, Industry 4.0 ensures that it not only is supposed to roll out the product but also establish the desired collaboration between the customer waiting at the end of the line for the product, manufacturer in the beginning and supplier in the middle. Industry 4.0 takes care of the whole supply chain management too (Tjahjonoa et al, 2017).

What goes in India's favor is that in just another year or so, India would be the third largest automobile market, apart from being major automobile manufacturing hub in the world. A whopping 25 percent of nation's GDP is contributed by the automobile sector; a moment that does not only instill pride but also calls for greater authenticity and reliable in the catering to the market. Industry 4.0 growth drivers can be conveniently integrated into the sector to boost it (Paris, 2017).

Industry 4.0 can boost India's manufacturing sector through some of its key enablers. Data enablers help transmit most appropriate and relevant data to applications that are responsible for the final manufacture and roll out of the product. Three crucial components of Industry 4.0 are responsible for this seamless execution - data visualization, digital manufacturing, and floor control network (Brettel, 2014).

Coordination between them all leads to operational efficiency. This also helps men as well as machines to identify issues quicker than later and suggest remedial actions in the shortest possible times. That is where the human interface plays a major role and debunks the myth that Industry 4.0 is going to entirely replace human workforce, a common but largely unfounded worry in the Indian industrial sector.

II. CONCLUSION

Industry 4.0 has is helping many developed European nations, especially ones like Germany, which being the manufacturing hubs, maintain an edge in the industry. Ever since the recent policy changes brought in by the union government, India is fast catching up with the developed world to stand shoulder to shoulder in the manufacturing sector. But this calls for greater workforce alertness, efficiency and reliability if India's manufacturing sector needs to be boosted further and propelled towards an unprecedented growth. Drivers from Industry 4.0 are going to help men by employing machines along with.

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