

A Study on Industrial Revolution 4.0- Opportunities and Challenges for SME's

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ABSTRACT

India is a country of SME's as they play a very crucial role in Indian industrial sector. They have become the wheels of economic growth due to their flexible and innovative entrepreneurial spirit. SME's are playing very significant part in making millions of jobs at the little ability level. It contributes around 40% towards India's total exports which shows the geographical cover of the enterprises. As the technology is advancing, SME section can live the attack by discovery groundbreaking ways to match and surpass customer prospects. The Cloud-based knowledge is extremely multifaceted but effective in order to reduce costs. The increase of novel numerical industrial skill, recognized as Industry 4.0, is an alteration that brands it likely to fold and examine data across apparatuses, thereby earlier, more supple, and well-organized procedures to harvest higher-quality things at abridged costs. This industrial rebellion will upsurge output, swing economics, development manufacturing growth, and benefit to promotion the outline of the staff which imprison eventually altering the keenness of businesses and areas. The fourth manufacturing rebellion suggests a deep alteration in the way manufacture takes place, whereby old-style manufacturing plants are substituted by keen sweatshops based on announcement between persons, machineries and products through the application of the Cyber Physical Systems (CPS) for manufacturing. The CPS is networks of microcomputers, sensors, and actuators that can be embedded to have smooth functioning in the business operations. The goal of this paper is to investigate the transformation of business models in the fourth manufacturing revolution in the manufacturing industry considering the production chain relationships of small and medium enterprises (SMEs).The present paper highlighting the opportunities and challenges in the adoption and exploitation of Industry 4.0 technology by industrial Small and medium enterprises.

Keywords: SME's, Industry 4.0, technology, opportunity, challenges.

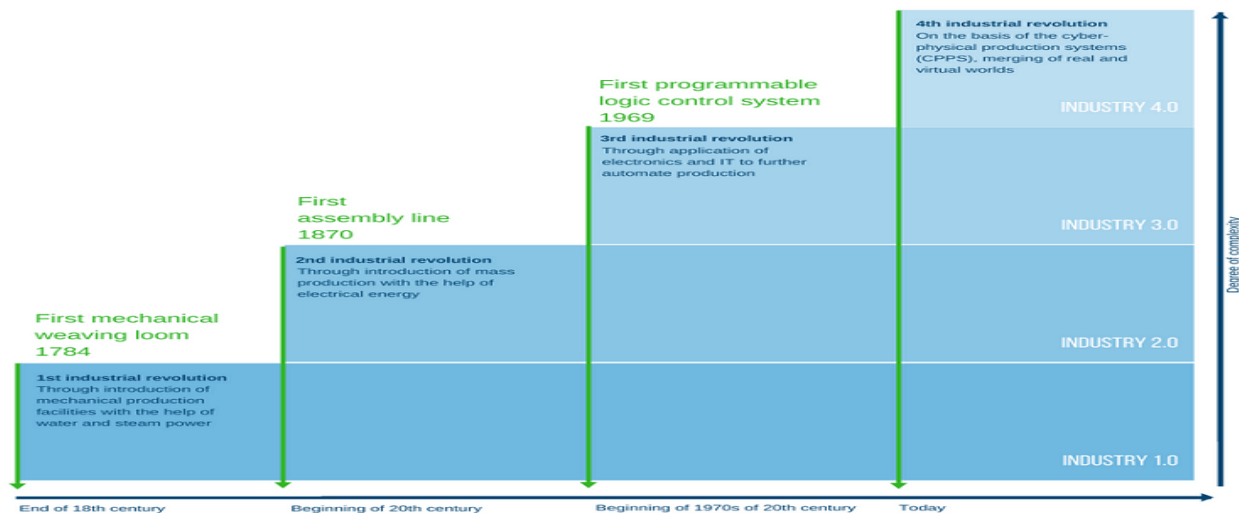
INTRODUCTION

Industry 4.0 is short term for the fourth business revolution. The term invented with a future-oriented scheme which was share of the German administration's high-tech policy. It has commanded to the mechanical integration of cyber-physical schemes (CPS) in fabrication and logistics, as well as the submission of the internet of belongings and the internet of facilities in industrial procedures, counting the penalties of all that for worth creation, commercial models, downstream facilities and work group which has economic possible attributed to CPS skill in industry. This potential is realized by means of networking of all elements of the value creation process in real time, enabled by CPS technology. The Industry 4.0 is a stint used for numerical rebellion in manufacturing production emerging from the complete schmoozing and mechanization of all extents of production. The equipment, apparatus, resources and end products catch ecological circumstances and processing status via sensors, communicate with one another via embedded software and thus optimize the manufacture process in an unparalleled manner. This allows businesses not only to organize their production process more professionally, but also, to production modified products within the outline of and at the same cost as automatic manufacturing. The variations rising from the numerical revolution in the manufacture and value formation process are fundamental and posture a real experiment to enterprises. In order to cope up with change and competition from large scale industry they need to develop strategies in good time to feat the new potentials of digitalization, to improve established procedures and develop new commercial models. Those who obstinately pause overdue run the risk of early demise. Though, a decent party-political, lawful and infrastructural outline should also helpful to allow businesses to rise to the challenge of Industry 4.0. Though many large businesses are already trying to forestall the possible and jeopardies of digitalization for their individual commercial models and have introduced invention

procedures, small and medium-sized enterprises seem to be creation heavy climate of it. The details for this is they are partially internal and partly outside. The firms must still adapt themselves to new changes in the market to maintain their competitiveness. The chief way of innovation is absorbed on Industry 4.0. This term is covering industry mechanization, robotics and digitization. Industry 4.0 brings enormous chances in terms of bigger productivity of industrial manufacture thereby reach sustainability. The research study of Deloitte (2014) conditions that large industrial firms already reflect Industry 4.0 to be very significant. To the conflicting, minor and medium-sized businesses do not reflect it to be of better significance to them. The firms must still adapt to the new changes in the market to maintain their competitiveness, as the word industry y4.0

MEANING OF INDUSTRY 4.0

Industry 4.0 is the term used to refer the fourth industrial revolution. It is mainly introduced to refer the processes involved in managing the industrial and chain production. It was principal publicly presented in 2011 as “Industries 4.0” by a cluster of legislatures from business, academics and politics beneath inventiveness to enhance the German keenness in the industrial organization. The German central government accepted the impression in its High-Tech Policy for 2020. Now all most all countries including India is trying implement in the respective fields. It started with first industrial revolution which used steam powered engines for production .next second revolution introduced telegraphs and railroads. The third revolution made businesses leaning on alphanumeric skills in production. The fourth business revolution has occupied the computerization of manufacturing procedures to a novel level by presenting customized and supple mass making technologies. This earnings that machineries will function self-sufficiently, or collaborate with persons in making a customer-oriented creation arena that continually upholding the work by themself and is talented to gather ,examines and recommend upon it as an self-governing object. The knowledge behindhand Industry revolution 4.0 is to generate a common network where machineries can connect with each other, named the Internet of Things (IoT) and with persons, called the Internet of People (IoP).



LITERATURE REVIEW

Trappey et.al.(2016) defines industry 4.0 as a concept which enables manufacturing with the elements of tactical intelligence and technologies like cloud computing, internet of things(IOT) and big data.

Apics(2005) states that to match with industry 4.0, SME’s must constantly work to improve their industrial management processes like planning, using resources, controlling production and measuring operational performance. Several production and switch management approaches previously in practice but it seems to be too rigid to implement in SME’s due to expertise and leadership (Achanga et.al,2016). However, generally accepted that it is essential to familiarize novel technologies if respective business process challenges(Alatoibi 2016) are healthy achieved and if augmented excellence and flexibility are to be

addressed in an environment of increasing complexity and offering possible solutions to problems of demand and volatile markets (Cheng et al. 2016). (Nieuwenhuis and Katsifou 2015) states that industry 4.0 has become a drive for ensuring the sustainability of industries especially SME's. so,if we want small and medium-sized businesses to be intelligent to produce more efficiently, it is necessary to fulfil the potential of Industry 4.0 (Ganzarain and Errasti 2016). The integration of the ideas of Industry 4.0 ideas will not only lead to changes in the production of SMEs but also expected to bring changes in other fields, such as labor markets and business models.

STATEMENT OF THE PROBLEM

The fourth industrial revolution so called "industry 4.0" is the brain child of technological advancement which consider that new technology is a future determinant of business environment. Throughout this development New value chains and business-technology models lead to the creation of new alliances and interconnections between businesses. Big Data database technologies, cloud computing, machine learning, Internet of Things, artificial intelligence, are the motivating factors for the successful implementation of industry 4.0. SME's which work on small scale and less investment find it difficult to cope with the new technology as it affects the employment of workforce also. Studies have been done to examine various factors and implications affecting SME's and its performance. While having robust research done on the SMEs and their contribution to employment and economy as a whole, studies failed to find the inevitable changes in business environment that will be caused by technology. As the technology keeps advancing at fast, SMEs must be worked to adapt to hiked technology environmental situation, at least, stay competitive role. In this era of industry 4.0., specifically, the 4th industrial revolution advocates a deep transformation in the way production takes place, whereby traditional manufacturing plants are replaced by smart factories based on communication between humans, machines and products which is the most challenging task for the SME. The present study highlights on opportunities available to SME's and also challenges facing by it while transforming into digitalization under fourth industrial revolution (4.0).

OBJECTIVES OF THE STUDY

1. To understand the existence of industry 4.0 in SME's
2. To examine the opportunities of SME's under industrial revolution 4.0
3. To identify the challenges of SME's in industry 4.0 and offer suggestions..

RESEARCH METHODOLOGY

The study is descriptive in nature as it is based on secondary sources of information. Different books, journals, newspapers and relevant websites have been referred. An attempt has been made to examine the strategy, challenges and opportunities of SME's in implementing and working with the fourth industrial revolution.

INDUSTRY 4.0 COMPONENTS AND DESIGN PRINCIPLES

As industry revolution 4.0 is digitalized era which is made up of various components like cyber physical system ,internet of things, internet of services and smart factory. A cyber-physical system aims at the integration of computing and physical processes. This means that computers and networks are able to monitor the physical process of manufacturing at regular interval at a certain process. The Internet of Things is what enables objects and machines such as mobile phones and sensors to "communicate" with each other machines as well as human beings to work out solutions. The Internet of Services aims at creating a wrapper that simplifies all connected devices to make make maximum uses by simplifying the process. It is the customer's gateway to the manufacturer. Smart factory is the factory which helps CPS to communicate with IOT and assist the people and machine in executing the task. The design principles of industry 4.0 allow manufacturers to investigate a potential transformation to Industry 4.0 technologies by sme's. These are interoperability, virtualization decentralization, realtimecapability, serviceorientation ,modularity.

Status of industry 4.0 in SME's: innovation is the most important driver of economic growth for large and small medium enterprises. To survive in the competitive scenario, they have to adapt themselves to the

technological changes or else will perish from the market. The current economy is directing towards innovation in the name of industry 4.0. The increase of new numerical industrial technology, recognized as Industry 4.0, is an alteration that assistances to gather and examine data across machineries, allowing faster, flexible, and achieve well-organized procedures to produce higher-quality goods at reduced costs. This manufacturing revolution will increase productivity, replace economics, foster industrial growth, and modify the profile of the staff in the sense more qualified skilled workforce.—ultimately changing the competitiveness of companies. Large organizations with huge capital investment are affordable to implement digitalization in their central corporate strategy. Whereas SMEs operate and function with very limited resources and also they have limited vision in terms of organizational goals find a problem in putting industry 4.0 paradigms into practice. They are usually supposed to have additional emphasis on economic necessities rather than communal areas mostly because of their existence strategy and their comparatively limited monetary base and are rival against the fund-rich well recognized MNCs creation the stand-up uneven and unequal. The SMEs are increasingly playing a crucial role in the economic and communal development of the country. As associated to business enterprises, SME's pay more lengthily as they have a part of 40% in terms of capacity, employment 80%, exports 60% and 92 per cent in rappers of number of initiatives. SMEs can only attain Industry 4.0 by subsequent SME-customized application strategies and approaches there by understanding SME-adapted ideas and technological solutions.

OPPORTUNITIES FOR SME'S IN INDUSTRY 4.0

Productivity: Industry 4.0 will lead to increased productivity for the SMEs. Through the technologies like automated robots, big data, cloud computing etc. the SMEs can excerpt insights from their data to change from sensitive to prognostic maintenance, monitor improvements, reduce waste and increase yield. Furthermore, they can tune quality management and thereby prevent costly rework. The emerging machine-machine and human-machine networks are able to optimize themselves automatically and, in interaction with people, solve problems themselves. This enables to increase the productivity. a customized product can be made for customers at the same price as a serial product today, providing a considerable boost to customer satisfaction.

Revenue Growth: Industry 4.0 will too foster income growth. Builders' request for improved and technical gear and new statistics applications, as healthy as customer demand for a broader diversity of progressively modified products, will leads to additional revenue growth for the business and customized products to the consumers.

Employment: The growth Industry 4.0 stimulates, will lead to an increase in employment. However, different skills will be required. In the small term, the tendency toward superior automation will move some of the frequently low-skilled worker who performs humble, repetitive responsibilities. At the similar time, the rising use of software, its connectivity, applications and new analytics will raise the demand for staffs with capabilities in software growth and IT skills, like mechatronics who are experts in the field of manufacturing that includes manifold industrial disciplines. Though it is a challenge it is needed to expertise in the same field .so that they can easily implement in their business strategies and gain competency. . Information about IT specialists is an indicator of companies' degree of digitization, and an analysis of Statistics Denmark states that innovation and more digitization require, that the company must have its own IT specialists employed.

Investment: Adapting production processes to incorporate Industry 4.0 will require that producers in all regions invest in new technologies and skills during the next years. This will lead to additional investments in the society in general.

Innovative business models and plan development: Industry 4.0 reinforces the business policies and commercial models of engineering SMEs in the setting of the chances and tasks of Industry 4.0. This is an essential precursor that will enable SMEs to assess, improve and adapt their innovation strategy. It will also help them understand how to apply their capabilities to their market environment and which aspects of Industry 4.0 will be important for sustaining their competitive advantage.

Reduced costs: In the last 10 years, the price of sensors, fog infrastructure, band-width and processing control has dropped meaningfully. The cutting-edge skills are touching into normal manufacturing making the application of business 4.0 more pertinent and appropriate to manufacturing industry. This really makes it possible for the SME's to install digitalization. There is apparent to be a growing mandate for the personalization of mass-produced goods. Smart automation can reach this economically as related factories, can deliver greater variation for customers still at high volumes, and while simultaneously increasing speed and reducing waste.

CHALLENGES FOR INDUSTRIAL SME'S IN INDUSTRY 4.0

Higher investment cost: The development and introduction of Industry 4.0 technologies require substantial investment. More difficult are the conditions for young, innovative ICT companies that develop applications for Industry 4.0 that are disruptive rather than incremental and turn them into marketable products. Such companies initially tend to lack a positive cashflow and dependent on external capital. Banks will not offer credit facility for newly started because they often do not understand the often entirely new products or business models of young ICT companies and do not receive sufficient collateral. So they will be able to entice venture capital to a disproportionate extent, so it is difficult for implementing the digitalization under industry 4.0

Skill and training: For implementing industry 4.0, SME's need to develop Industry 4.0 skills and attract relevant personnel. Especially IT specialists are needed for the company's transformation into a digital age and in regard to purchasing new technologies and IT systems. Information about IT specialists is an indicator of companies' degree of digitization, and an analysis of Statistics Denmark states that innovation and more digitization require, that the company necessity to have its own IT specialists employed. But it lacks in getting highly trained and qualified IT professional as it is costing huge to the business and the lack of personnel leads to bottlenecks in production. teamed up with IT employers to develop an IT Academy stimulate training for IT employees and is currently developing a program to retrain professionals from other field of IT employment, so overcoming this problem of lack of labors in IT skilled personnel is the biggest challenge for SME's. In many cases is difficult for SMEs to find the right employees for IT work in general and I4.0 employment in particular.

Lack of resources: With regard to individual Industry 4.0 processes and technologies, however, it appears that across the board, regardless of company size and branch, little use is made of the evaluation of large data streams to optimize processes or for downstream services. Accordingly, cloud services are implemented little and not of higher-level which is generally applied in large business. Due to lack of resources, It is not easy for small and medium-sized enterprises, to assess the technological maturity of the relevant solutions and their business uses.

Knowledge of automation: A lack of standards and norms with regard to interface technologies is another reason why investments in the integration of IT systems are either not carried out or delayed. Only 20% of SME use ICT applications, 16% on economic activities, only 55% of SME's know how to use internet and 40% do not need the internet. Technology upgrading is used as a cost and not as an investment. So lack of knowledge of automation forces these enterprises for low investment in automation. The lack of general standards thus makes it difficult for SMEs to join value creation networks with different standards and norms, thereby constraining their room to maneuver.

SUGGESTIONS

- It is very crucial to grasp the connections between business and social needs, as society need customized products and services. so in this way definitely the revolution is must..
- Building the technological foundation is very important to upgrade in technology, such as the tool base for analytics for adopting competitive strategy.
- Building the right organization structure and capabilities to overcome the competitors.
- Develop partnerships that are essential in the digital world to share the knowledge as well as resources.

- Upgrade technological infrastructure, such as fixed- and mobile-broadband services to complete the work within less span of time. Infrastructure must be rendered fast, secure, and reliable enough for companies to depend on it for near real-time data so that overall cost can be reduced..
- Get the right skills and therefore adapt school curriculum, training, and university programs and strengthen entrepreneurial approaches to increase the IT-related skills and innovation abilities of the workforce – as well as upgrade the existing workforce.
- it is important to further analyze this approach in order to be able to draw conclusions on the demographics of labor in the future. This will help workers of today prepare for a future.

CONCLUSION

The big revolution in the field of technology is industry 4.0 which change the virtual world into digital world is very much vital for all those engaged in manufacturing and providing services. This manufacturing revolution will increase productivity, upgrade economics, foster industrial growth, and modify the profile of the workforce as technical and qualified workforce—ultimately varying the competitiveness of companies and regions. Though various challenges are coming in the way of SME's still common opportunities will enable to increased productivity, competitiveness and growth.

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