THE ROLE OF INDUSTRY 4.0 OF SMALL AND MEDIUM ENTERPRISES IN UTTAR PRADESH

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Abstract:
The fourth industrial digital revolution in industrial production emerging from the comprehensive networking and computerization of all areas of production. Equipment, machinery, materials and products apprehend environmental conditions and processing status via sensors communicate with one another via embedded software and thus optimize the production process in an unprecedented manner. From an industrialization point of view, the state has the highest number of micro, medium and small enterprise (MSMEs) in India. The small and medium scale sector has been assigned an important role in the industrial economy of the country on account of some of its inherent advantages like low capital intensity, high employment generation capacity, GDP and export earnings, regionally balanced development and even distribution of wealth and income. The fourth industrial revolution has begun and offers attractive opportunities for industrial companies. However, the industrial internet is not an end in itself. It is closely tried to clear economic objectives and holds the potential for clear differentiation in global competition. This study focuses on the fourth industrial revolution which helps to develop small and medium enterprises in Uttar Pradesh.

Keywords: Small & Medium, Enterprises, Uttar Pradesh, Industry 4.0, Development, Employment Generation, etc.

Introduction

Uttar Pradesh is the state located in northern India. It is the most popular state in India and is the fourth largest Indian state by area. It is the second largest Indian state by economy. Uttar Pradesh is not only one of the largest states in India; it is also one of the most important regions in India from an economic point of view. Agriculture has been one of the biggest sources of revenue for the residents of Uttar Pradesh. The service sector and industrial sector is the second largest sector of U.P's economy like- Ghaziabad, Kanpur, Allahabad, Moradabad, Bareilly, Aligarh, Sonbhadra and Varanasi are known for their industrial importance in the state. Here in the industrial sector a large pool of skilled, semi- skilled and unskilled labour employed. The population is also looked upon as a largest consumer base in the country with around 200 million peoples. Its contribution to gross state domestic product (GSDP) expended at a compound annual growth rate (CAGR) of 11.29% to 3.76 trillion (US$ 213.44 billion) where as the net state domestic product (NSDP) expended at a (CAGR) of 11.24% to 12.22 trillion (US$ 189.62 billion). The state has witnessed a high rate of infrastructure growth in a recent past. There has been a considerable rise in the number of industrial cluster/ hubs and public private partnership (PPP) projects in the infrastructure domain. The state has become a hub for the semi conductor industry with the several major players having their offices and research and development (R&D) center in Noida. The small scale Industries constitute an important segment of the state economy in term of employment generation, source of foreign exchange earnings and exports the favourable government policies coupled with availability of large pool of human resources make the state one of the best location for sitting up SSI's units within the state.

Objectives of the Study

1. To understand the importance of employment generation and development of industrial economy in the context of Uttar Pradesh.
2. To review the challenges faced by MSME (Micro, Small &Medium Enterprise) in adopting industry 4.0 technologies.

Research Methodology:

The present study is exploratory in nature and relies extensively on secondary data used. The secondary data were collected from various published annual reports of the ministry of MSME,s and annual reports of Uttar Pradesh MSME,s development schemes, and Journals, magazines, old research papers literatures and websites. The scope of this study is confined only to Industry 4.0 of Small and Medium Enterprises in Uttar Pradesh.

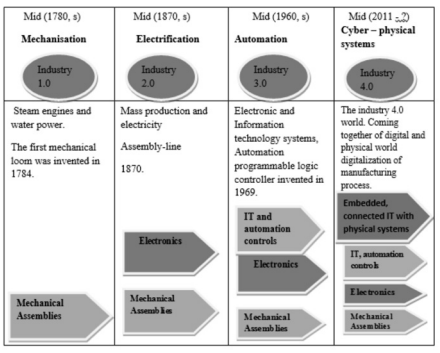

Figure 1: Development of Industry 4.0

What is Industry 4.0?

Industry 4.0 it is a new method of production that is creating a fourth industrial revolution. Go a bit backward, about 250 years ago under the 18th century James Watt's made new improvements to the steam engine since then first industrial revolution has started.

Since the beginning of the assembly line in 1913, Henry Ford's started the second industrial revolution, which resulted in a huge increase in production of the time they were discontinued in 1927. Soon after this every manufacturing industry started using the assembly line to increase efficiency and productivity as well as cut cost, the days of mass production had arrived.

As a result of the third industrial revolution in 1970, the computers started at the bottom of the factory giving the rise to the automated assembly line for mechanical work. Computers have changed humans rapidly; another major inflection point in productivity, seemingly today every manufacturing functions that can be automated. Has been highly automated factories turn out the complex consumer electronics products that we take for granted at prices we can afford.

This is not end, right now our vision is for industry 4.0 fourth industrial revolutions for "cyber physical production system" in which sensor-laden, smart production, smart manufacturing functions, machine process, modular system, smart embedded device start working together wirelessly either directly or IoT the internet of things (Internet cloud), AI artificial intelligence, machine learning, robotics. This is the industrial 4.0 vision for the fourth industrial revolution.

The fourth industrial revolution or industry 4.0 is upon us and replacing the inefficiencies of traditional automation with automatically coordinated automation using the internet things together with artificial intelligence and another technology.

The concept of cyber physical system was first defined by Dr. James Truchard, Based on the virtual representation of a manufacturing process in the CEO Software of National Equipment in 2006. On January 2012, the German Federal and education and research ministry established the working group of comprehensive strategic recommendation to implement industry 4.0 on the word created by the group. The industry 4.0 project is now part of the German government's official high-tech strategy, who is actively working in with private sector partners discussed the industry 4.0 at the April's Hanover fair, which is why we are suddenly hearing about it. Industry 4.0 is more than a sight in comparison to a reality at present. But this potentially one with far – reaching consequences, and the concept is evolving because people think of the innovative ways of implementing it, though some things are all ready clear-

1) The sensors will be involved in every stage of the manufacturing process in which the raw data, as well as the necessary response by the control system, will be provided.
2) Industrial; control system will be distributed so far and widely flexible will enable stain process control well.
3) RF technologies will tie together the distributed control modules in wireless mesh networks, enabling systems to be reconfigured on the fly in a way that is not possible with hard-wired centralized control system.
4) Smart connected embedded devices will be everywhere, and designing and programming them will become that much more challenging not to mention interesting and rewarding.
5) Programmable logic will become increasingly important seems it will be impossible to anticipate all the environment changes to which control systems will need to dynamically respond.

The prospect of Industry 4.0 in today's digital India:

- Internet of things (IoT) - To enable real-time machine to machine interaction.
- Big data analytics - To facilitate real time decision making.
- Cyber security - To ensure data security and secured communication.
- Cloud computing - For ensuring computational, storage and network capabilities.
- Additive manufacturing - To help reduce lead time and improve customization.
- Robotics - To provide for automation of manufacturing process and help improve efficiency.
- M2M - To facilitate communication of machine and software.

The Impact of Industry 4.0 on micro, small & medium Enterprise's of Uttar Pradesh

India is the sixth largest manufacturing country; manufacturing sector becomes an integral part of the country's long term vision, as the government focus on a campaign to be carried out in India (make in India). The aim of the government is to increase the share of manufacturing in GDP from existing 17% to 25% by 2022. A number of initiatives and policy reforms such as implementation of the GST (Goods and Service Tax) and easing FDI policy (Foreign Direct Investment) has been taken by the government at present, India is missing its Global partners for adoption of industry 4.0. An important part of the Indian manufacturing sector is still in the electrification phase, which works independently from each other with the use of technology limited, the

integration of physical system on cyber platforms, the basic premise of 4.0 is still act its infancy. A part from this, due to high cost constraints, there is very little access to Micro, Small & medium enterprise segment technology. It is said that India's moving ahead with progress that India is seeing to very important and competent 4.0 technologies IoT and big data is developing the right platform on the basic of our smart factories. As per the Report of the Working Group on Micro, Small and Medium Enterprises (MSMEs) Growth for 12th Five Year Plan (2012-2017), the sector contributes 45% of the manufacturing output and 40% of total exports of the country. Currently, the Sector consists of 36 million units, and as of this year, provides employment to over 80 million persons. More than 6000 products ranging from traditional to high-tech items are being manufactured by the MSMEs in the country. Two things that make the MSMEs crucial to 'Make in India' are the labor to capital ratio in MSMEs. More employment generation potential and the overall growth in the sector is much higher than in the large industries, and secondly, help in industrialization of rural & backward areas, thereby, reducing regional imbalances, assuring more equitable distribution of national income and wealth. Thus, growth in the MSMEs can directly lead to better equity and inclusion in the Indian Economy.

Make in UP – Leveraging the success of Make in India. The 'Make in India' program of the Government of India has been able to draw the global attention by driving investments, fostering innovation, developing skills, protecting Intellectual Property and building best-in-class manufacturing infrastructure. As a strategy to usher industrial growth in Uttar Pradesh and capitalise on the positive global sentiments generated by the progress of Make in India campaign, the UP will embrace this landmark initiative and strive to implement it in letter and spirit by launching a comprehensive program of 'Make in UP'. In lines with the 'Make in India' program, the 'Make in UP' program will adopt a strategy that inspires, empowers and enables in equal measure in making UP a manufacturing hub of India. Towards achieving this goal, Government of UP will implement the following:

1. Creation of a dedicated Make in Uttar Pradesh Department.
2. The Make in UP Department will identify and create industry and sector specific State Investment and Manufacturing Zones (SIMZ) with an aim to spur manufacturing, generate employment, raise living standards and meet national & international trends of sustained growth.
3. To boost the entire manufacturing value chain in the identified zones, the Government will ensure necessary timely interventions in consultation with all stakeholders in addition to the fiscal and non-fiscal measures mentioned in this policy.

Vision of the Policy

The vision of the Industrial Investment & Employment Promotion Policy of Uttar Pradesh. Nationally and internationally competitive investment department of MSME, generating employment and inclusive balanced economic growth of the state.

The Government of UP will strive to achieve the vision through the following strategies -

- Enabling infrastructure – Developing new infrastructure and upgrading existing ones
- Employment generation – Creating opportunities
- Fiscal incentives – Attracting investments
- Ease of doing business - Creating a conducive industrial environment
- Make in UP – Leveraging the success of Make in India
- Skilled Manpower – Reaping the benefits of demographic dividend
- Innovation – Promoting Start-Ups
- Micro, Small & Medium Enterprises – Ensuring all round industrial growth
- Sector approach – Benefitting from sectors of strength
- Sustainable & Inclusive growth – Ensuring clean & balanced distribution of economic growth
- Investment Promotion and marketing 'Brand Uttar Pradesh'
- Domestic & Global Environment – Gaining from external factors and being responsive to them

Mission

- Increase capital investments in the state.
- Provide quality infrastructure for industries to flourish.
- Promote ease of doing business to create business friendly environment.
- Generate maximum direct and indirect employment and self-employment opportunities for both skilled and unskilled workforce.
- Skill the workforce of the state to ensure employability and empowerment.
- Provide pro-active support to micro, small and medium enterprises.
- Promote the spirit of innovation and incentivize entrepreneurship among youth.
- Ensure balanced, sustainable and inclusive economic development.
- Ensure effective implementation of the policy.

Uttar Pradesh Government Schemes

1. Prime Minister Employment Generation Programme (Pradhanmantri Rozgar Srijan Karyakram), ASIDE, Industrial

Infrastructure Upgradation Scheme, Quality Improvement, Scheme for establishing Pollution Prevention Plants, registration of Intellectual Property Rights and Geographical Indicators, Credit Guarantee, Marketing Assistance, Skill Development, Management Development, Bar Coding, etc. and in the area of classified industries, such as textile, hosiery, leather footwear, food processing, etc. maximum benefits of the Central government schemes will be channelized to the entrepreneurs in the State. Through this, it will also be ensured that MSME sector of Uttar Pradesh gains a competitive edge in exports. A special cell will be created in the Directorate of Industries for the implementation of the Central government schemes, under which an officer in-charge will be appointed for every scheme. In this cell, as and when required services of external experts would be obtained for financial management, project management and monitoring.

2. To augment the effectiveness of the marketing system of handicrafts sector, direct purchasing schemes under the arrangement of exhibition of manufactured goods will be implemented by corporation and private sector. Skills of handicraft artisans will be improved and new designs would be made available to them. Under the State scheme, based on proper valuation of handicraft products, their selling price would be determined and they would be sold on the basis of commission. Under this scheme, provision will be made for artisans to provide advance amount proportionate to their goods produced so that they do not face working capital scarcity.
3. Modernisation and technological development of micro, small and medium enterprises would be encouraged. In this regard, schemes will be implemented to provide loans at lower interest rates to entrepreneurs.
4. State level financial institutions will be revived for financing Micro, Small and Medium Enterprises (MSMEs), through which implementation of the Central government and the State government schemes will be ensured.
5. Efforts would be made to obliterate regional imbalance in the State and to provide more employment opportunities to young men and women of less developed regions. Poorvanchal (Eastern U.P.), Madhyanchal (Central U.P.) and Bundelkhand regions will be given special concessions, such as Capital Investment Scheme for small enterprises, Interest Subsidy Scheme and other Capital Subsidy Schemes. Implementation of such schemes would lead to eradication of regional imbalance in the State, increase in the productivity of these regions and availability of employment opportunities for the workforce.

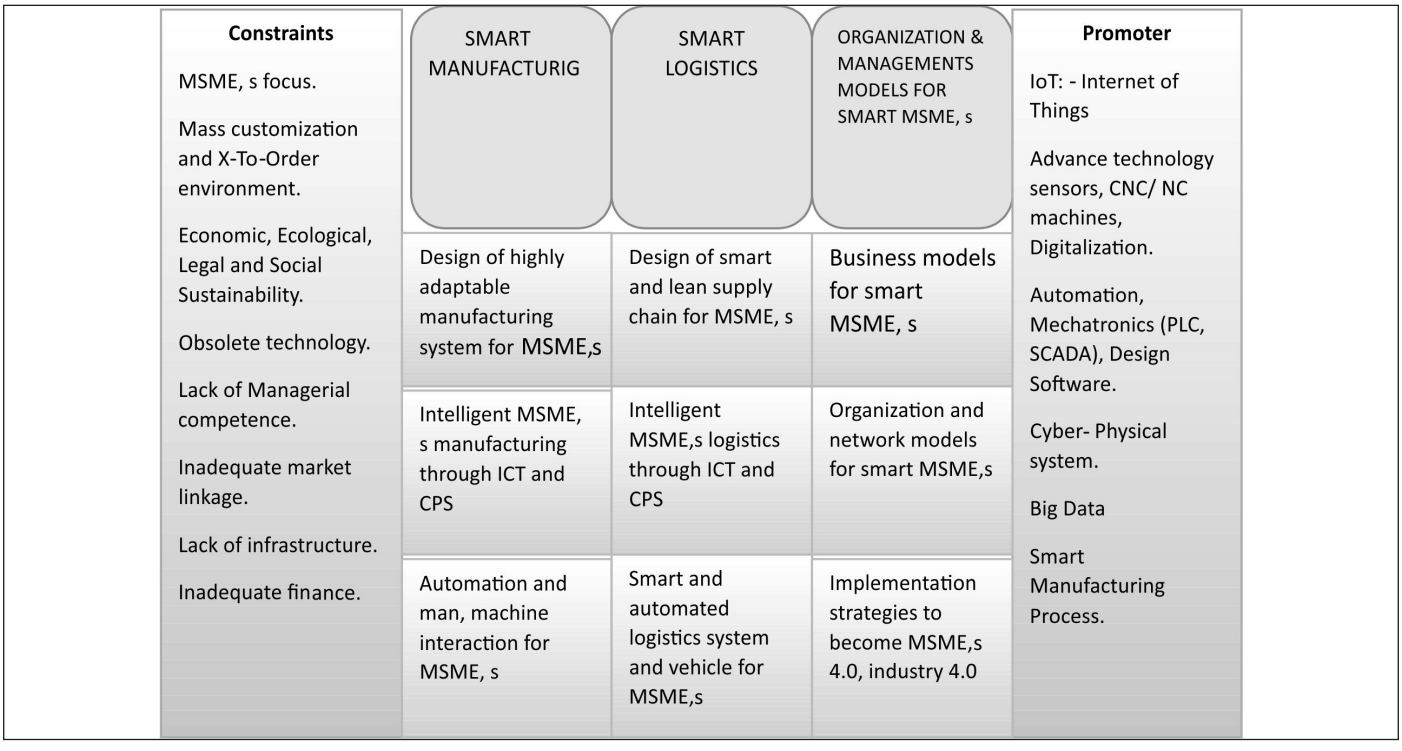

Figure 2: MSME 4.0-Industry 4.0 for Micro Small and Medium Enterprises

Constraint of MSMEs

Inadequate Infrastructure: The sector must be availed infrastructural technology and skilled manpower in tune with the global trends. Most of the MSMEs are either in decades old industrial estates, or functioning in the urban areas or have come up in scattered fashion in rural areas where the state of infrastructure like power, water, roads, etc are in poor condition or unavailable. The scale of manufacturing must also be focused upon.

Obsolete Technology: Except a few industries, the MSME sector is characterized by low and outdated technical practices, making it a handicap when compared with other emerging markets technological levels. Also the sustainability gets jeopardized with an increased competition in the domestic market from imports. The government should focus on technical imports from technologically developed countries so that our products should get an indirect association with an established label which is already recognized in the export market.

Finance: Banks, trade promotion organizations and other support institutions can take measures to help overcome such problems. Also due to high risk perception among the banks about the sector, there is a problem of access to adequate and timely credit at a reasonable cost. The transition costs for the loan appraisal are also high for the sector.

Limited Access to Global Markets: The inward performance of foreign companies has been highly successful in India but the outward performance of the Indian companies is not a success story as a result of globalization. Same is the case with Indian MSME sector, which is a serious threat to the sector. Reasons cited can be technological obsolescence, scale of operations, lack of promotional marketing, inability to access institutional credit and intense competition are some of the shortcomings of the sector while addressing the global market.

Branding and Marketing: The branding and marketing activities of the MSMEs are extremely low due to low exposure of the market, low promotional outputs, and the high costs involved in the branding of the products. Though Provenance Paradox is observed in case of products from emerging economies (BRICS) to developed nations, branding strategies should be developed in such a way that offers minimal resistance for the acceptance of the products from the emerging economies in the export markets. A tie-up in contract manufacturing with a foreign branded manufacturer & marketer, a strategic alliance with a technology provider, a stake sell out to a foreign partner, a merger or an acquisition with a foreign entity, etc. can help the MSMEs in this regard to enhance their brand image in the overseas market.

MSME, s Promoter for Industry 4.0

Industry 4.0 starts from smart factories. Digitization, standardization, intelligence and control, and smart manufacturing. This includes smart mobility, power, building, logistics, etc. New technologies, such as analytics, big data, IoT, cloud, etc. has made us switch to Internet based thinking. The product, process, information, services and platform, integrates all of this.

- Real time, believable data about your factory, leading to data driven decisions.
- Better lot planning, more in depth understanding of line flow.
- Better product traceability.
- Reduced manufacturing cycle time, Smart and automated logistics system and vehicle for MSME, s
- More accurate/meaningful manufacturing and engineering data.
- Better understanding of equipment utilization and OEE.
- Reduced rework and scrap.
- Reduced manufacturing costs, and smart manufacturing process.

Conclusion

As we discussed earlier fourth industrial revolution is on its way to occupy the world and likely provides large opportunities. Through Industry 4.0 it is feasible to create prolonged ecosystem with qualified employees and to bear on India's edge in manufacturing and can orchestrate to large scale customization. Although it is very tough to manage the process centrally if players in the system apply right levers there will be reinforced effects. Thus it is imperative to communicate the ideas that players in government and corporate sector will profit most if an initiative of Industry 4.0 goes together. By adopting Industry 4.0, we will have a major competitive advantage over global competitors in economy. But first and foremost we need to have the essence of speed in order to capture this opportunity and to achieve our goal. India ready to embrace the new industrial revolution, the government need to invest heavily in the country's education system and bring the literacy rates to respectable number. Currently, India's literacy rate is a shade more than 70 percent. That surely has to change. Further, localisation of production should be promoted, and startups should be given enough freedom. It is only then that the fourth industrial revolution would bring about a meaningful change in the lives of Indians. The present study mainly focus on MSME,s micro small and medium enterprises in Uttar Pradesh and ready to adopt the changes in MSME,s in UP such as the Fourth Industrial Revolution. To make changes in the MSME,s we have to adopt new technology and smart manufacturing process, smart production, machine process, modular system, smart embedded device start working together wirelessly either directly or IoT the

internet of things (Internet cloud), AI artificial intelligence, machine learning, robotics, etc. MSMEs over the years have assumed greater significance in our burgeoning national economy by contributing to employment generation and rural industrialization. This sector possesses enough potential and possibilities to pushbutton accelerated industrial growth in our developing economy and well poised to support national programme like 'Make in India'. In lines with the 'Make in India' program, the 'Make in UP' program will adopt a strategy that inspires, empowers and enables in equal measure in making UP a manufacturing hub of India. Towards achieving this goal.

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