

TEXTILE 4 IS THE INDIAN TEXTILE INDUSTRY READY?



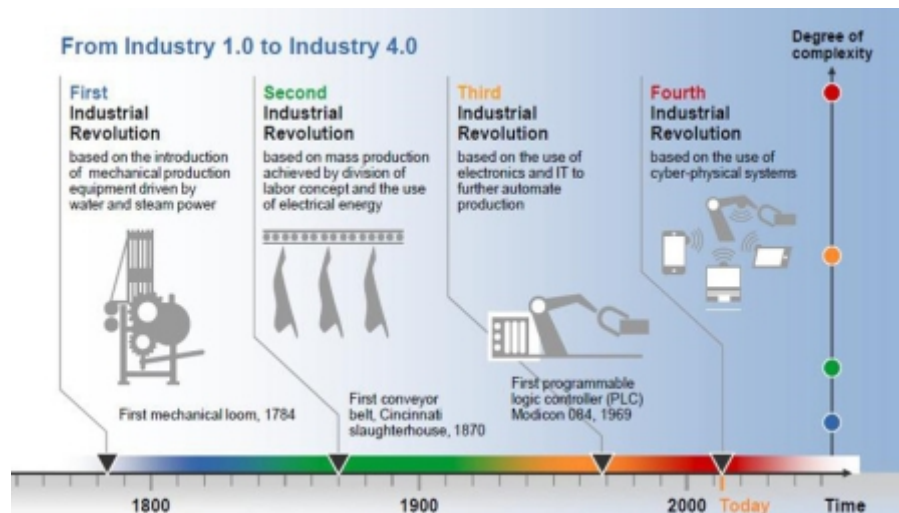
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Introduction

The industrialization of the world began in the late 18th century with the advent of steam engine and the invention of power loom. This has radically changed how goods were manufactured then. A century later, electricity and assembly lines made mass production possible. The 3rd industrial revolution began in 1970s, wherein computing-powered automation made it possible to programme machines and networks.

Today, a fourth industrial revolution, comprising of cyber-physical systems is transforming every part of manufacturing, supply chain and society in general. Under the title of Industry 4.0, many physical and digital technologies are converging through analytics, robotics, artificial intelligence, cognitive technologies, digitalization and internet of things. These technologies will create digital enterprises which can communicate, analyse and use data

to drive intelligent actions in the physical world. Such 'smart factories' can leverage use of these technologies in manufacturing, supply chain, decision making and communication and can create disruptive effects on the business in the coming years. The rise of new industrial digital technology, under industry 4.0, will



gather and analyse data across machines enabling faster, more flexible and efficient processes, which will help in producing high quality goods at reduced costs. This manufacturing revolution will ultimately help in increasing productivity, improving economics resulting in fostering growth and changing the competitiveness of organisations.

Textile and clothing industry and Textile 4.0

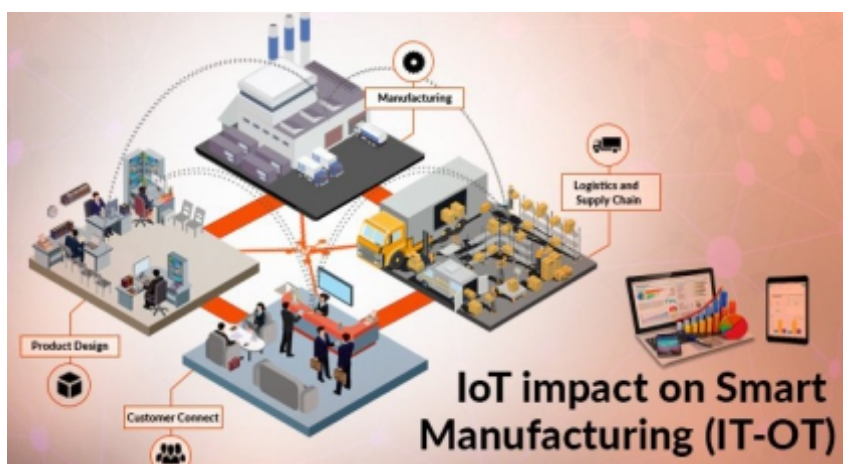
Due to use of intensive labour, lack of technology and rising costs the competitiveness of the textile industry in many countries is weakening. As a result of these constraints the level of productivity and efficiency as well as quality is getting affected. Since most of the textile manufacturing companies do not have flexible operational structure they are not adoptive to the changing outside world and to the change in the consumer demands. Also the new trend is to have customisation of the products with more variations requiring adjustment to market requirement in shortest possible time. Also the product life cycles are shortening with changing fashion trends as well as the global competition is increasing intensely. In this backdrop higher dependence on labour force with potential human errors in production, supply chain, etc. become an obstacle. Perhaps industry 4.0 may help the textile and clothing industry to solve these problems with possibility of flexible manufacturing, redesigning of industrial processes and technological advances. All the processes related to manufacturing and logistics may become more flexible and agile in textile value chain under Textile 4.0. This will help in giving quick and effective response to the market needs.

Application of Textile 4.0 by the textile machinery industry

Following the footprint of global manufacturing industry, textile industry is also trying to align itself for innovations and upgradations. While the textile machinery manufacturing industry, particularly in Europe, has already aligned itself fully towards industry 4.0, the textile goods manufacturing industry is somewhat slower in this regard. Most of the machines supplied by textile machinery makers have smart factory platforms built in so that they can collect, measure and analyse data through sensors, data loggers etc. and this information is used on user interface for taking actions or decisions. Many of the state of the art textile machines of today's generation are IoT enabled,

digitized and have ability towards artificial intelligence.

Many of the leading textile machinery makers have introduced complete production process monitoring systems through Internet of things (IoT), which can give various analytical reports on the real time basis and this is very useful in reorientation of the production and quality processes for better results. In case of some machinery makers, the data collected through operation of the machine is built into knowledge and is also used for predictive maintenance and predicting potential breakdowns (Machine Learning).



Textile 4.0: Rise of smart factories in textile manufacturing

The global textile manufacturing industry is gradually on its way to adopt to industry 4.0 due to which wide range of possibilities have emerged for using the above referred various technologies in their manufacturing and supply chain.

- By adopting IoT (internet of things), the decision making process for the management has shortened significantly in view of availability of lot of value through based information and analysis on real time basis. Initiatives of industry 4.0 through IoT are being driven by thousands of intelligent devices generating massive volume of data. However turning this data into value is a critical success factor.
- BMS Vision, SPIDERweb, T-data and Spinconnect are some of the production monitoring softwares used extensively by the textile companies for optimising the manufacturing processes and improving the productivity, efficiency and quality.
- KARL MAYER, leading supplier of warp preparation and warp knitting machinery, has a new concept of digital factory called KM.ON which helps

customers in machine networking, data management, maintenance support etc. through an App, irrespective of the location.

- Artificial Intelligence is used in analysing large chunk of data collected from manufacturing, purchase, marketing and logistics etc. This is used by the textile companies for trend predictions and machine diagnosis.
- Robotics and automation is making faster inroads into the garment manufacturing. Sewbots (sewing robots) are extensively used in China in garment factories. Tianyuan Garments, China's largest vendor to Adidas and Reebok, has put up a factory to make 26 million T-shirts per annum with use of 300 Sewbots. Automation is fast getting into textile operations and with help of it the textile producers are able to improve productivity, quality and reduce wastage.

flexibility in the manufacturing process by catering to customized demands. Mostly it will enter into high end fashion products in textiles.

- Integrating the electronic functionality into textiles will open up a whole new world for its applications.
- Conductive fabrics with a possibility of using thermochromic ink (undergoing reversible change of colour when heated or cooled) for printing will give the fabric very special functional abilities.
- Usage of electroactive polymers into textiles will give light emitting abilities to the garment.
- Nano technology and plasma technology will be used more widely in the future textiles for specific applications.
- Modification in the fibre and filament properties can give multifunctional capabilities to textiles.
- Smart and wearable textiles or intelligent textiles will be making big inroads into our daily lives in future. These devices can sense, measure and react to the environmental or body conditions. These textiles are already being used for medical, defence and sports purposes.



Textile factories of future with application of Textile 4.0

The future of the textile manufacturing will have data driven smart manufacturing with convergence of different technologies and more adoptive machine-human interface.

With a right approach by the Indian textile industry towards adoption of Textile 4.0, following benefits can be accrued.

- Shorten time and cost to market by at least 20%
- Increase productivity and efficiency

Technology convergence under Textile 4.0

As far as textile industry is concerned different technologies are converging resulting in major disruption in the textile manufacturing and also the products. The future of textiles lies on the potential of technology convergence which would result in development of smart and intelligent clothing.

- 3D printing is expected to bring in a huge shift in textile manufacturing in future by bringing

- Seamless information flow across the value chain
- Enhance value addition by 10%
- Reduce cost by 5% every year
- Reduce rejection rate by 50% due to better control on quality
- Become globally competitive

For achieving the above objectives, the Indian textile companies need to realign themselves with the following steps

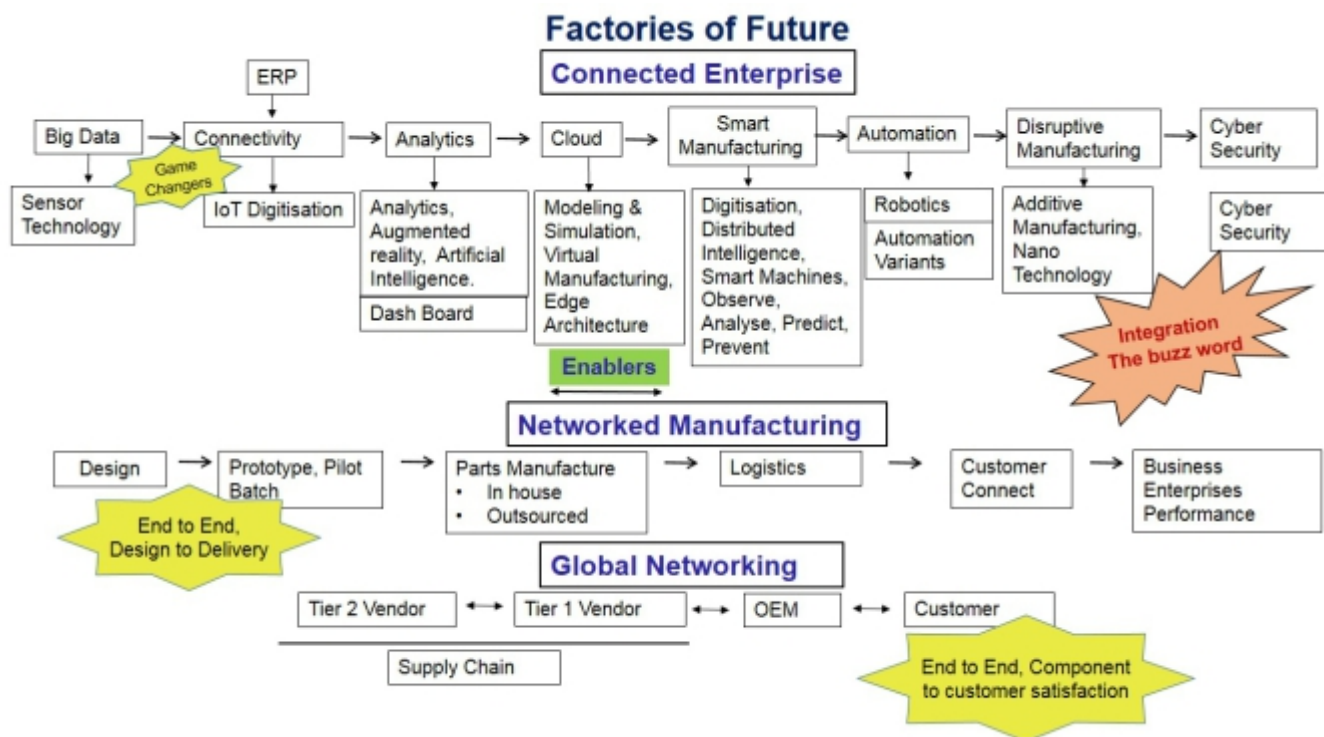
- Initiate experiments with technology through pilots
- Upgrade the present IT infrastructure and technology platforms
- Increase spend on R&D and innovation
- Shift towards compliant and environment-friendly manufacturing
- Create sustainable advantages in business leveraging the technology
- Re-train the work force with required skill sets for new technologies
- Keep in mind the social angle w.r.t. workforce and consumers

Textile 4.0: a way forward for the Indian textile industry

The ecosystem for industry 4.0 is supportive in India as more than 80% of the country has good coverage of 4G and 3G. India also is a superpower in information technology. When the whole world is moving towards industry 4.0 rapidly, our Indian textile industry cannot

be left behind. The good news is that many of our leading textile companies, although are not fully industry 4.0 compliant, are already using some of the applications via the latest textile machinery they have installed recently. Most of these state of the art machinery is IoT enabled, has automation, possibility of cloud computing, use digitization and get collected data analysed for decision making. Some Indian textile companies are already using 'Manufacturing Execution System (MES)' from BMS Vision, Belgium which help in optimizing the production processes across the textile production chain. Some of the mills are using the specialized software packages like T-Data (Truetzschler), Spiderweb (Rieter) and Spinconnect (LMW) on the respective suppliers' machinery for online monitoring of the production and quality. Many of the Indian spinning mills have installed spindle monitoring systems on their ring frame which give real time data that can be used for improving productivity and efficiency. In weaving as well many mills are using online monitoring systems like 'Loomdata' for monitoring the weaving shed performance. Many of the leading finishing technology suppliers from Europe already have machines which can interact intelligently with the human beings and help in optimising the process parameters, utilities consumption etc.

The Indian textile companies are also taking baby steps towards Textile 4.0 but the pace has been much slower since the required ecosystem including IT infrastructure and specially trained manpower is still



not up to the level. The Cobots (collaborative Robots) are being extensively used in China and Srilanka in garment making and now the garment innovation centres in Bangladesh are using them in jeans manufacturing. In this backdrop I expect the Cobots to soon enter India in garment manufacturing once big corporates put up sizeable capacities at one place. The automation and artificial intelligence is gradually making a backdoor entry in the textile industry and in the coming years more and more textile production centres will become smart factories. Indian textile industry will have no choice but to catch up with the rest of the world by converting the production centres into smart factories in view of rising labour costs, increasing manufacturing and energy costs and wastages in the processes. Only by getting into Textile 4.0 bandwagon now or later will Indian manufacturing become more competitive against major textile producing countries like China, Bangladesh, Vietnam and Srilanka. The Indian logistics sector is also fast adopting industry 4.0 and the supply chain of textile industry will get benefited due to the same in terms of proper production planning as well as fast movement of goods.

In view of the new challenges the textile industry will be posed with the advent of Textile 4.0, it is necessary that the business leaders and the managers understand its implications and prepare a roadmap to successfully integrate the manufacturing, supply chain, marketing towards achieving Textile 4.0 compliance. Textile 4.0 will also need a totally different skill set for the managers and the operators and a specialized training will be required for them to make them useful in the new era. With adoption to Textile 4.0 the traditional jobs are likely to be lost making way for new generation of IT and technology oriented employees.

Looking at the major paradigm shift required in the thinking of our textile industry, the Textile Association of India (Mumbai Unit) has organised 2 international conferences on the subject of Textile 4.0 in the last one year. More than 600 delegates, including some mill owners, got benefitted by participation. Indian textile industry has a long way to go before it becomes Textile 4.0 compliant and can compete strongly against the other nations. One thing is sure that for the Indian textile industry the preparation of roadmap to Textile 4.0 is inevitable, whether we like it or not.
