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Research Article

Rising Demand of Digital Manufacturing in India during Post - COVID Era

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Abstract

A pandemic COVID-19 has increased the demand for medical equipment, medical accessories along with daily essentials for the safety of healthcare workers. This study aims to identify the operational challenges faced by retailers in providing efficient services. Manufacturing is a broader concept of manufacturing innovation in which the digital and material advancements enable the company to conceive products in a desired style and quantity in time scales shorter than the conventional methods while efficiently managing the entire product lifecycle. This paper reviews how the Digital Manufacturing industry played a key role in stopping the spread of the Coronavirus by providing customized parts on-demand quickly and locally, reducing waste and eliminating the need for an extensive manufacturer.

Keywords: COVID-19, Digital transformation, Digital manufacturing, Additive manufacturing, 3D Printing.

1. Introduction

Since the last century, global economies have been faced recession due to sudden changes in policy, oil prices, or other financial issues. The COVID-19 pandemic in India is part of the global pandemic caused by the severe acute respiratory syndrome coronavirus. As of May 2025, India had recorded 45,041,748 instances of COVID-19 infection. COVID-19 disease named by WHO, abbreviated as “corona virus disease 2019” was detected in the Wuhan city, China, on December 31, 2019 [1]. Prediction of the global pandemic confirmed when WHO declared it as a pandemic on March 11, 2020 [2]. It made complicated to be quarantine and maintain social distancing to eliminate the transmission. Most of the countries around the world banned travel and announced lockdown and restricted the movement of people. Due to lockdown and limited movement, distribution points became inaccessible and disrupted the supply chain. Due to spreading of the COVID-19, the supply of all the goods to protect the health of consumers becomes challenging as compared to normal situation. Increment in global competitions, diversification of customer demands, unpredictable market trends became the major challenges for the manufacturing market to integrate design, manufacturing, and product support processes to reduce the product development time and deal with constantly increasing complexity in products and manufacturing enterprises without compromise in quality.

Because of the threat it poses to human health around the world, the COVID-19 pandemic has had devastating effects on the economies of all countries. Businesses had to change their business models, working conditions, marketing communication, technology usage, strategy development, and supply chain relationships in order to continue operations that had come to a halt. In order to

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realize this change in the best way, businesses have attempted to integrate digital tools into their business processes. [12] As a result, the business world experienced a rapid digital transformation. Adoption of Industry 4.0 have eliminated the problems of retailers. Industry 4.0 is the integration of modern technologies like internet of things (IOT), cyber-physical system (CPS), Clod computing (CC), Big Data, etc. that provide flexibility, visibility, trackability and reliability in a system. [10] In 2025, smart industries are increasingly defined by their digital tools and ability to perform data-driven decisions. Currently, there are four main digital manufacturing trends that impact production workflows, workforce engagement, and operational flexibility. 1) Intelligent automation is taking over routine operations. 2) Digital twins for predictive and agile manufacturing. 3) Sustainability and energy efficiency in digital manufacturing. 4) Workforce digitization and training.

2. Conventional and Digital Manufacturing

Conventional manufacturing is an in-line process in which the product is first designed and the drawings are forwarded to shop floor for the production of the prototype. Digital technology is a cyclic process in which the product is designed conceptually and innovated in CAD software. These designs and the processes are simulated to verify the feasibility of manufacturing the product. The product is tested during each stage of the manufacturing process through different inspection techniques as well as by computer aided quality control methods. Supply chain management is also digitized for effective inventory and producing customized products. Product marketing is done with the help of the social media to improve the profitability. Digital manufacturing is an emerging area which supports collaboration across many phases of the product lifecycle which has been evolved from manufacturing initiatives such as design for manufacturability, computer integrated manufacturing, flexible manufacturing, lean manufacturing etc. [1] Along with the digital manufacturing over the conventional setup, the Process Design, Workflow, Plant Layout, Resource Management and all other such functions are affected and need to be reviewed with the changed perspective for achieving production goals. [8]

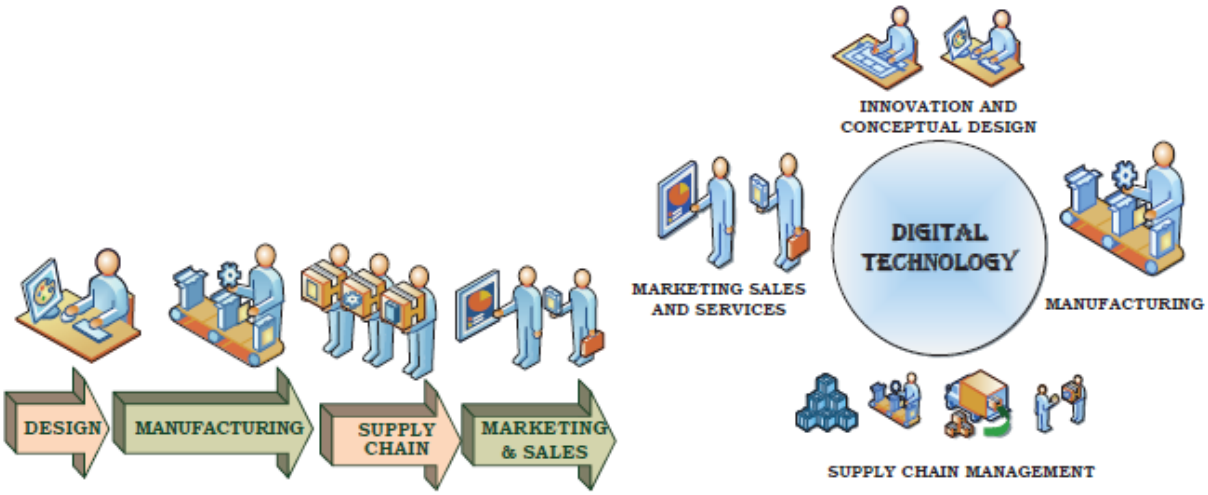

Fig. 1. Conventional and Digital Manufacturing Processes.

3. Industry-4.0

Currently, advanced technologies have wide impacts on manufacturing models, approaches, concepts and also on businesses. Industry 4.0 incorporates emerging technical advancement for the improvement of industry so as to deal with some global challenges that is oriented towards digital and virtual technologies. It is driven by real-time data interchange and flexible manufacturing, enabling customized production. [2] Digital Manufacturing existing under the umbrella of Industry 4.0 technologies and integrating technologies and information throughout the product life cycle.

Industrial entrepreneurs accept that digital manufacturing technologies will transform all aspects in the manufacturing systems of value chains.

Industry 4.0 or Industrial Internet of Things (IIOT) refers to the industrial transformation based on the utilization of emerging digital technologies to enable data collection and analysis through devices and business systems. Therefore, quicker, more flexible and more effective manufacturing processes can be adopted to produce high-quality, low-cost, highly customized goods. Increasing demands of the market for better quality and personalized goods determine the acceptance of new technologies. The philosophy of Industry 4.0 encourages the digitalization of traditional manufacturing. The production system is turned into an ecosystem of entities that interact in a universal manner. Over 90% of the manufacturing resources are not integrated in the industrial communication network.
Moving towards the current pandemic crisis of COVID-19, the reaction of the companies to COVID-19 challenges have accelerated the digital transformation already in various manufacturing environments. Thus, real-time data collection and advanced analytics tools might provide a more comprehensive, reliable, and up-to-date image of plant operations for teams operating remotely. [5]

4. Additive Manufacturing

Additive manufacturing or layered manufacturing (3D Printing, Direct digital producing) is a sophisticated manufacturing technique that replaces process-based job shop operations to product model driven operations supported a 3D CAD model. This technology uses digital files for the assembly of crucial medical components that has been proven essential throughout the COVID-19 crisis. 3D printing is a distinctive technique of making components beside standard reductive or formative producing technologies. In 3D printing the half is created directly in designed stage layer-wise, that shows a unique arrangement of advantages and confinements - a lot of on this to a lower place. The 3D printing technique has to suppose outside the quality for ever-changing human services. [7] Applications of Additive manufacturing processes are mentioned as below:
1. Automotive Industry: Applications of 3D printing within the automotive business vary from building prototypes, jigs, and fixtures, tooling, low volume user product and thought models and reproducing components.
2. Part and defence Industry: In producing light-weight components with geometric and material complexities necessary to make sure safe travel in rigorous conditions.
3. Chemical compounds and Material microstructures: 3D printing a flexible means that of providing efficient and customised product is revolutionizing all kind of chemical industries to kitchen utensil producing.
4. Medical Applications: Additive producing technologies square measure in the main employed in surgical and diagnostic aids, medicine development, tissue engineering etc.
5. Food: Food processing involves labour intensive and repetitive operation, automation in food manufacturing increases efficiency and quality. Food printing is a digital food manufacturing process allows customized colour, shape, flavour, texture etc. to a cookie.
6. Construction Engineering: Creating architectural models with the help of hand techniques prior to actual construction is a usual practice. It followed by architects which demonstrate the models to the customers.

5. Benefits of Digital Manufacturing

• Integration of Product Design and Manufacturing Processes.
• Reduce Cost and Development Time for Process Design.
• Shorten Time-to-Launch to introduce new Product with Faster Ramp-up for Production Systems.
• Provide Manufacturability through simulation of manufacturing operations prior the production.
• Increase Quality by Validating Production Process Design.

• Reduce and eliminate Prototypes and Physical Mock-ups with Virtual Simulations.
• Improve Collaboration with Suppliers by Providing Early Access to Design, Production Process, and Resource information.
• Improve Concurrent Design Methods by Linking Product Design to Manufacturing & Controls Engineering.
• Validate Manufacturing Processes, Production Systems, and operational resources through Virtual Commissioning prior to physical implementation.

6. Applications of Digital Manufacturing

• Digital manufacturing has found larger applications in different industries such as aerospace and defence. This allows for the integration of supply networks through cloud computing to allow suppliers to collaborate effectively.
• Digital manufacturing technology is also perfectly aligned for incorporation into automated processes such as additive manufacturing, laminated object manufacturing, and CNC cutting, milling, and lathing.

7. Top Digital Manufacturing Trends in COVID-19 Era

Digital transformation is not only a slogan; it is a reality for most of the industries today. With Industry 4.0, an increasing number of manufacturers are moving to digital technology as companies are transforming from mass production to customized production. Digital manufacturing goes beyond just supply chain, it is about business operations and revenue growth, transforming products and improving the customer experience. These digital manufacturing trends are changing the way through which organizations do business.

Cybersecurity

The role of cybersecurity is important nowadays thanks to vital producing operation risks for connected devices, digital offer networks and every one producing systems. whereas advancement in sensors, computer science, and wireless technologies allows a paradigm shift in producing, cyber-attacks cause vital threats to the producing sector.

Security solutions ought to be engineered into the general system, as well as measures like advanced physical security, time period cryptography, high-level network security, restricted information access systems then on. Since good factories embrace machine-to-machine and man-to machine communication, management of identity, authorization and authentication structures should be designed to support of these interactions, but, at constant time, to produce access solely to the approved parties (man or machines).

Augmented Reality (AR)

Real-world interaction with the virtual world might create DM additional sensible, tacit, and applied. increased Reality (AR) may be a technology that allows the overlay of virtual info onto the $64000 world in time period. this permits for user-based interaction, facultative virtual info (texts, images, sounds, etc.) rendered onto a true setting. Main role of AR in DM is to produce Associate in Nursing overlay of virtual info onto the $64000 world in time period, permitting quick, integrated and correct decision-making. AR is employed in several producing life cycle phases, from assembly path simulation (process planning) to additional complicated tasks like substitution physical manuals with increased virtual contents (ramp-up for operation).

Autonomous Robots

Autonomous robots area unit in a very growing class of devices which will be programmed to perform tasks with very little to no human intervention or interaction. a rise in autonomous robots

being programmed with computer science to acknowledge and learn from their surroundings and create selections severally. the most role of autonomous robots in DM is to support the look and simulation of autonomous or hybrid workstations.

Internet of Things (IOT)

The Internet of things (IOT) describes the network of physical objects -"things" - that area unit embedded with sensors, software, and alternative technologies for the aim of connecting and exchanging information with alternative devices and systems over the web. The IoT will connect varied producing devices equipped with sensing, identification, processing, communication, actuation, and networking capabilities. IoT helps makers contour, alter and modify varied producing processes. IoT is remodeling several aspects of operations as well as time period production observance, up the accuracy of important metrics and products yield rate efficiencies.

Manufacturers area unit chop-chop investment in IoT to make new merchandise and services whereas driving down production prices. This transformation is ever-changing the method managers place confidence in however they interact customers and empower staff whereas up overall operations. Fig. 1 compiles the data provided in section 3 for the characterization of a coherent DM application domain in business four.0. The framework presents 3 main set of information: producing life cycle phases, the DM tools employed in every part, and therefore the business four.0 technologies which will be used with individual tools.

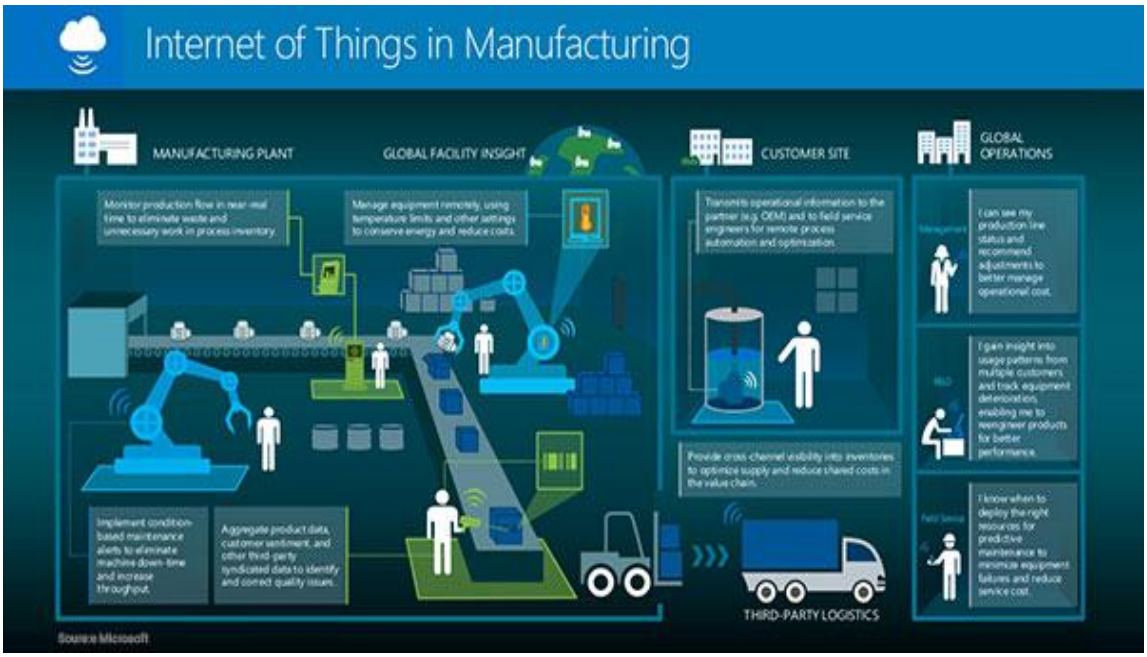

Fig. 2. IOT Applications in manufacturing.

Analytics

Analytics offers fast and straightforward access to production, inventory and alternative quality information that allows managers to regulate machines and platforms across the enterprise. Analytics helps makers determine quality problems additional with efficiency, increase production and scale back issues that cause a range of service problems.

Big data Analytics offers fast and straightforward access to production, inventory and alternative quality information that allows managers and operators to regulate machines and processes consequently. Data Analytics minimizes plant shut-downs and will increase overall productivity and yield potency. Makers will currently have call manufacturers predict the performance of their entire operations that ends up in Associate in Nursing improved offer chain, additional economical processes, and reduced waste.

AI and Machine Learning

AI continues to be a well-liked digital initiative that enhances deciding and improves the client expertise. Technologies that originate from AI embrace machine learning; laptop vision; language processing; speech recognition; robotics; etc. computer science is currently remodeling the producing business. the continuing maintenance of producing instrumentality and assembly line machinery ends up in huge expenditures as a result of unplanned time period prices.

ML is that the science of obtaining computers to find out Associate in learning act like humans do and improve their learning over time in an autonomous fashion while not specific programming. cc provides data to computers through information, observations, and interactions leading to improved performance.

Artificial intelligence (AI) in world producing market is predicted to grow at a CAGR of forty one.2% from 2020 to 2027 to achieve $18.8 billion by 2027. Moving on to the present pandemic crisis thanks to SARS-CoV-2, the reaction of the businesses to COVID-19 challenges ought to accelerate the digital transformation already current in several producing environments. Therefore, time period information assortment and advanced analytics tools might offer a additional comprehensive, reliable, and up-to-date image of plant operations for groups operative remotely.

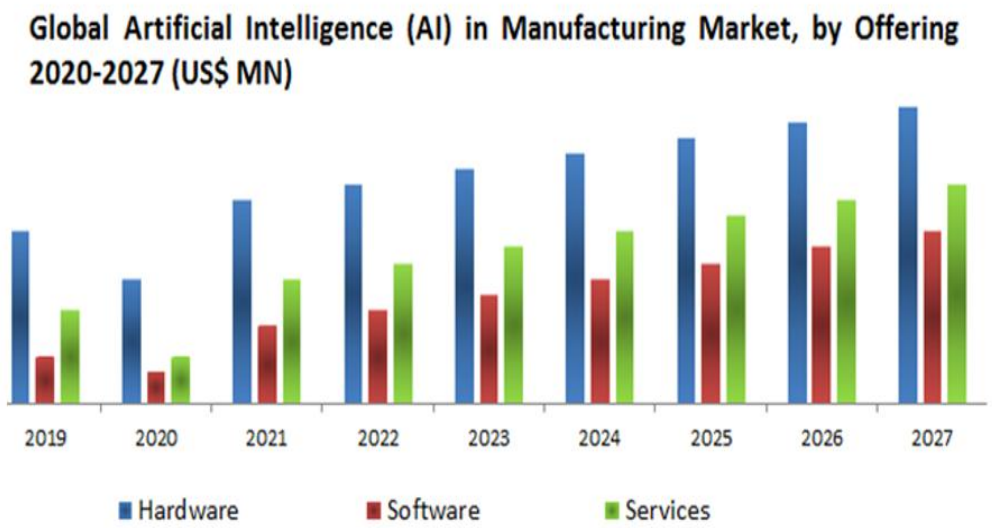

Fig. 3. Study analyzed revenue impact of COVID -19 pandemic on the sales revenue of market leaders, market followers and market disrupters in the analysis. (Source: https://www.maximizemarketresearch.com)

3D Printing

The objects will be used as a prototype; a tool jig or fixture employed in the producing process; or a finished sensible. 3D Printing permits makers to develop and revise merchandise chop-chop before enterprise the expensive processes related to ancient producing. This technology trend accelerates development and reduces the time-to market.

Manufacturers are finding that 3D printing will contribute to increasing production flexibility, additional increasing sales and driving revenue growth. Providing custom-built merchandise and services is additionally rising as makers admit 3D printing to contour and grow their mass customization and build-to-order product ways.

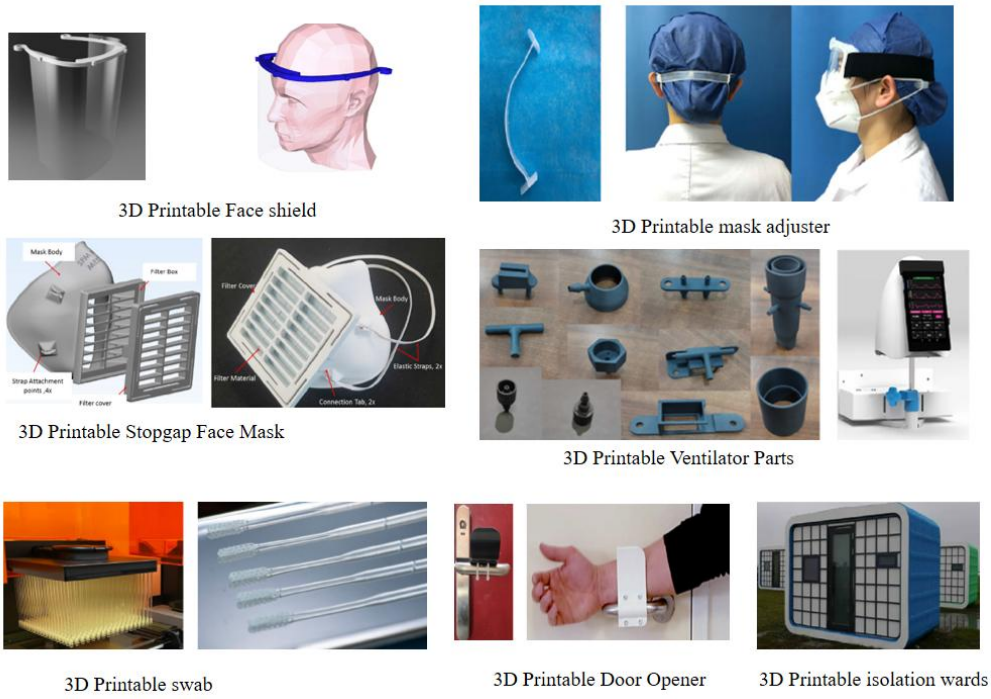

Fig. 4. 3-D printable PPE designed to prevent wearer exposure to infection or illness during COVID-19 pandemic.

Edge Computing

Edge computing refers to the allocation of computing workloads to the "edges" of a network–to devices and resources nearer to network endpoints than a centralized information center or cloud. Edge devices will be sensors, IoT enabled machines, gateways, or single-board computers. Edge computing has monumental potential to modify digital initiatives supported by mobile and IoT technologies. This digital trend permits good applications and devices to reply to information virtually instantly while not latency, permitting call manufacturers to require action on insights quicker than before. Since information is being processed close to the supply, it reduces information measure usage. This technology helps eliminate prices and make sure that applications will be used effectively and firmly in remote locations.

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The role of cybersecurity is crucial these days because of vital producing operation risks for connected devices, digital offer networks and every one producing systems. Whereas advancement in sensors, computing, and wireless technologies allows a paradigm shift in producing, cyber-attacks cause vital threats to the producing sector.Security solutions ought to be designed into the system, as well as measures like advanced physical security, period of time encoding, high-level network security, restricted information access systems and then on. Since sensible factories embody machine-to-machine and man-to machine communication, management of identity, authorization and authentication structures should be designed to support of these interactions, but, at constant time, to produce access solely to the licensed parties.

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Fig. 5. Autonomous Robots.

Manufacturing organizations that invest in digital technologies can emerge additional competitive. With the explosion of connected devices and platforms in conjunction with huge quantity of knowledge, organization have to be compelled to quickly adapt to a digital world. Implementing sensible, connected technologies, producing is remodeling however elements and merchandise area unit designed, made, used, and maintained. Thus, leading to organizations characteristic quality problems additional with efficiency, rising worker resource potency, and optimizing overall offer chain and processes.

8. Business continuity through Digital Technologies during extreme disruptions of COVID-19

The Extreme disruptions area unit events that interrupt the regular flow of products or services inside a system like pandemics. Extreme disruptions have devastating effects for business and provide chain performance and thus SME potency, gain, and survival. Their effects area unit increased and exacerbated as producing, services, and commerce area unit globally connected. Manufacturing process analysis is important for producing corporations to enhance market competition. [6] To avoid a possible pandemic-level occurrence of Coronavirus, recommendations to utilize advanced producing resources to produce hospital services during a short period of your time. The government of India have launched completely different schemes/services to boost funds and adopt new technologies in producing and another sector. [7] Recent studies [9] state that the digitalization of trade have driven a brand new wave of productivity through the producing sector.

COVID-19 had a new impact not solely on health and humanity however additionally on the worldwide economy. The forceful shift in consumer behavior has created AN everlasting ripple result on businesses from all industries. The short term behaviors of customers handling this crisis tend to last long-run impacting business models, partnerships, and therefore the competitive landscape.

The producing trade had a varied response to the COVID-19 state of affairs – whereas some makers were reducing production, others were increasing and adapting new technology to satisfy the growing demand. Shifting to a versatile resolution, automotive industries were developing ventilators and masks. This had opened opportunities for brand new partnerships and collaborations. The global COVID-19 pandemic brought with it a range of public health challenges and economic consequences. 3D Printing and additive producing were known as upon to assist quickly fill inventory and provide shortages of medical instrumentality. i.e., personal protecting instrumentality to respirators and ventilators. This speedy and centered response by the producing sector and

therefore the additive producing community was integral to a range of different essential crucial infrastructure sectors and their employees. because the country gears up to resume producing once the Coronavirus imprisonment, the Centre is ramping up new methods to alter AN uninterrupted offer chain and an unionised acquisition market. Government made public a mechanism to confirm that the native producing sector's merchandise area unit purchased regionally.

The Government of India (GoI) have launched completely different schemes/services to boost funds and adopt new technologies in producing and another sector. Republic of India is a very important player and tremendous potential for scattering new technology within the Indian market and acquire economic advantages with cheap additive technology value, and future prospects still rise. India's producing sector solely accounts for sixteen per cent of the country's gross domestic product as compared to twenty nine per cent in China, twenty one per cent in FRG, twenty eight per cent in Asian nation, and twenty per cent in state. However, to boost the contribution of producing in India's gross domestic product, the govt has launched flagship schemes like Make in India, Skill India and Start-up India, and has also set an ambitious target of increasing the contribution of the manufacturing sector to 25 per cent of GDP by 2022.

Fig. 6. Government of India (GOI) have launched different schemes/services to raise funds and adopt new technologies.

Post COVID-19, the worldwide sensible producing market size is calculable to grow from USD 181.3 billion in 2020 and projected to succeed in USD 220.4 billion by 2025, at a CAGR of four.0%. The estimation for 2020 is down by ~16% as compared to pre-COVID-19 analysis. Factors that drive the expansion of the sensible producing market embody the increasing demand for merchandise & resolution propelled by COVID-19, the importance of digital twin in maintaining operations inside the producing scheme, and therefore the rising & increasing role of cooperative robots in aid and producing sectors. Moving on to the pandemic crisis, the reaction of the businesses to COVID-19 challenges accelerated the digital transformation already current in several producing environments. Real time data collection and advanced analytics tools could give a additional comprehensive, reliable, and up-to-date image of plant operations for groups operational remotely. In the wake of the COVID-19 pandemic, businesses globally have undergone unprecedented transformations, compelled by the imperative of digitization [13].

Tata Steel in Kalinganagar, is one among 44 global elite facilities on the World Economic Forum's Lighthouse Network of companies.

Schneider Electric, aims to bring its Bangalore and Hyderabad facilities on to the network.

Siemens, whose parent companies are already Lighthouse Network players.

ZETWERK

manufacturing platform that takes on key tasks such as finding the right fab shops, purchasing materials, and handling quality assurance.

ALTIZON
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Altizon in Pune is an Industrial IoT platform that connects assembly lines to the Cloud and analyses its outcome.

Chizel is a B2B cloud platform for manufacturing of plastic and metal parts for autos.

ClairViz
Connect.Converge.Analyze.Act

Mumbai start-up Clairviz, analyses the data from Cloud-connected assembly lines, installed and monitored sensors at the Hindustan Petroleum's Mumbai refinery and oil depots.

Fig. 7. Some known Indian companies & start-up using digital manufacturing.

9. Digitisation of MSMEs

COVID-19 affected the MSME sector then businesses were digitally beneath ready. Technology is that the backbone of MSMEs gain success within the post-COVID world. Digitisation isn't any longer facultative currently. Trade fairs, for instance, won't be doable for an extended time, thus holistic e-marketplaces can become a vital method for MSME makers to achieve dead set potential customers, suppliers and lenders to grow their system and business.

10. Conclusion

In this paper, we have a tendency to known the consequences of the employment of Digital Technologies to secure business continuity throughout extreme disruptions and international society shocks. supported the researches, our investigation offers measurable proof that the foremost potential medical service things that may be invented utilizing 3D printing ar those who have a high profit with one set of kit and with limitless accessibility of hardware within the market. Digital producing appearance set to continue and grow within the future as utilization of data for various production processes becomes more and more automatic. With systems that ar able to move with one another, the event of trade four.0 appearance in trend for joined-up production so as to sustain in hyperbolic competition and improve the contour processes. Digital producing in future will be stewed all the way down to a straightforward scheme: connect assets, collect data and correct settings.

References

1. Phani Kumari Paritala, Shalini Manchikatla, Prasad KDV Yarlagadda, Digital Manufacturing-Applications Past, Current, and Future Trends, 2017. Procedia Engineering, Elsevier, 174, p. 982 – 991.
2. Elias Hans Dener Ribeiro da Silva, Ana Carolina Shinohara, Edson Pinheiro de Lima, Jannis Angelis, Carla Goncalves Machado, Reviewing Digital Manufacturing concept in the Industry 4.0 paradigm, Procedia CIRP, Elseveir, 81 (2019), p. 240–245.

3. Elias Hans Dener Ribeiro da Silva, Ana Carolina Shinohara, Edson Pinheiro de Lima, Jannis Angelis, Operating Digital Manufacturing in Industry 4.0: the role of advanced manufacturing technologies, 2020. Procedia CIRP 93, p. 174–179.
4. Thanos Papadopoulos, Konstantinos N. Baltas and Maria Elisavet Balta, International Journal of Information Management, https://doi.org/10.1016/j.ijinfomgt.2020.102192
5. Dimitris Mourtzis, Machine Tool 4.0 in the Era of Digital Manufacturing, 2020. 32nd European Modeling & Simulation Symposium, 17th International Multidisciplinary Modeling & Simulation Multi conference, p. 416 – 429.
6. Jovanovic, V., Debevec, M., Herakovic, N., Verma, A., & Tomovic, M. (2016). Applications of digital manufacturing in manufacturing process support. Technology Interface International Journal, 16(2), 41-46.
7. Piyush Patel, Piyush Gohil, Role of additive manufacturing in medical application COVID-19 scenario: India case study, Journal of Manufacturing Systems, https://doi.org/10.1016/j.jmsy. 2020.11.006
8. Application of Digital Manufacturing in Global Automotive Industry: A Review, 2017. IJSRD - International Journal for Scientific Research & Development, Vol. 4, Issue 11, p. 675-680.
9. Gregory Harris, Ashley Yarbrough, Daniel Abernathy, Chris Peters, Manufacturing Readiness for Digital Manufacturing, Manufacturing Letters, Elsevier, 22 (2019), p. 16–18.
10. Mr Shashank Kumar, Dr Rakesh D. Raut, Dr Vaibhav S. Narwane, Dr Balkrishna E. Narkhede, Applications of industry 4.0 to overcome the COVID-19 operational challenges, Diabetes & Metabolic Syndrome: Clinical Research & Reviews 14 (2020), p. 1283-1289.
11. Mohd Javaid, Abid Haleem, Raju Vaishya, Shashi Bahl, Rajiv Suman, Abhishek Vaish, Industry 4.0 technologies and their applications in fighting COVID-19 pandemic, Diabetes & Metabolic Syndrome: Clinical Research & Reviews 14 (2020), p. 419-422.
12. Biswajit Mohapatra, Sushanta Tripathy, Deepak Singhal, Rajnandini Saha, Significance of digital technology in manufacturing sectors: Examination of key factors during Covid-19, Research in Transportation Economics, Volume 93, June 2022.
13. Nihal Yazici, Nilsah Cavdar Aksoy, The Rise of Digital Transformation Within Businesses in the Pandemic. In Handbook of Researchon Digital Transformation Management and Tools, (2022), pp. 24-46. IGI Global.*Managing the Challenges of Digitisation and a Contemporary Business Issue at Coca-Cola*.

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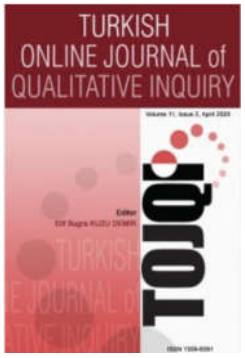

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