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Research Article

Industry 5.0 and Entrepreneurship: Human Centric Approach

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ABSTRACT

Industrial evolutions have been the constant change witnessed over the years. Right from Industry 1.0 of Steam Power to current Industry 5.0 of Technological influence with Human centricity, Industry evolutions have been a reality. To the world it has been evolution but for the Entrepreneurs it has been Transformation. Entrepreneurship referred to be as the risk-taking virtue, finds this evolution as more opportunity prone. Industry 5.0 is very much part of Industrial domain today and gradually gearing up. Industry 5.0, the Fifth Industrial Revolution, certainly is emerging phase of industrialization that potentially looks humans working alongside advanced technology and artificial intelligence (AI) powered robots to enhance productivity & work profile.

This article talks about the advent of Industry 5.0 and links it to the Entrepreneurship. The study is descriptive in nature and conducted based on the secondary data. The Research aims to understand the concept & significance of Industry 5.0. The study further aims to study human centric approach associated with Phenomenon of Industry 5.0 and its influence on Entrepreneurship at large. The Author recommends a model associated with Industry 5.0 and Entrepreneurship. The study encompasses the domain of Industry 5.0 and discusses the exploration. The author has considered the industry at large as potential recipient of the industry 5.0 benefits and superficially talks about the advantages. This turns out to be limitation of the study and the inferences gathered are indicative in nature rather exhaustive.

KEYWORDS: Industry 5.0, Industry 4.0, Entrepreneurship, Start Ups, Human Centric Approach

1. INTRODUCTION

The Current generation of Manufacturing is changing, Mindsets are changing. The expectation will be that the data and information should be in the palm of the hands, easily accessible and that the employee needs to make the decisions.

- Sachin Mathur, Rockwell Automation

Data Driven Industrial society is a big reality today. Entrepreneurship has largely become data driven exercise. The process of Entrepreneurship has been emerging in every phase of Industrialization. The Emerging Industry revolution has posed its respective challenges and benefits at large. The recent advent and talk in the industrial town are the industry 5.0, the Fifth Industrial Revolution. It is certainly a new phenomenon based on the previous revolution i.e., Industry 4.0. It is the emerging phase of industrialization that considers humans working alongside advanced technology. The core characteristics include human centricity, resilience and Sustainability.

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The entrepreneurs across the domain are facing the revolution and not just manufacturing. Industry 5.0 builds upon the fourth industrial revolution i.e., Industry 4.0 and is enabled by developments in I.T. that include facets such as artificial intelligence, automation, big data analytics, the Internet of Things (IoT), machine learning, robotics, smart systems etc. Industry 5.0, states to be a vision of industry which aims to be better on efficiency and productivity and reinforces the role of industry to society. "This is an important distinction from the approach of Industry 4.0, as it places the wellbeing of the worker at the center of the production process and uses new technologies to provide prosperity beyond jobs and growth while respecting the production limits of the planet. The industry 5.0 is beyond just the focus on economic value towards a broader concept of societal value and wellbeing. This revolution has broader perspective than seen with Industry 4.0. Industry 5.0 is still in its early stages, with many businesses still focusing on gaining the insights of Industry 5.0. However gradually it will have more impact & relevance. The independent reports suggest globally Industry 5.0 shall create impact of worth USD 255.7 by 2029.(<https://www.marketsandmarkets.com>, 2024) The main advantage of Industry 5.0 is the creation of higher value jobs. The greatest challenge will be the execution & implementation past i.e., how organizations are able to adapt to embrace this new concept. It will help those who are in a position to become more human-centric, resilient and sustainable.

2. LITERATURE REVIEW

The author has referred a few literatures and the review of the leading ones is presented below:

A new industrial paradigm called Industry 5.0 emerged very shortly after Industry 4.0, sparking discussions regarding the new paradigm's purpose and justifications for its use. The author believes that the industry 4.0 is lesser focused on humans. It is more emphasizing on machines and systems. As a result, it is advisable to design and develop the human-centric aspect of technologies, now prominently known as Industry 5.0. It is a shift in paradigm that will place less emphasis on technology and will impact and influence societal transformation. The Authors aims to discuss Industry 5.0, analyze its potential opportunities and applications, explain the various technologies enabling it, focus on inherent challenges in its implementation, and discuss its prospects.(Dr. Shweta Joglekar, 2023)

This study fills the gaps by thoroughly reviewing research publications from various journals and conferences on the issue of Industry 5.0, making it easier for enterprises to prepare for the future. Organizational structure and procedure strengthen the favorable association between Industry 5.0 and IT adoption. The primary aim of this research is to investigate Industry 5.0 techniques to increase economic growth post pandemic. The study also dives into analyzing and summarizing readiness of Industry in adopting Industry 5.0.(Rakesh Kumar Birda, 2022)

The paper focuses on the concept of Society 5.0 and Industry 5.0. It may not be just a continuation or alternative to Industry 4.0 paradigm. Industry 5.0 will support both universities and societies to fully benefit from digital transformation. The authors believe that one of the main aims of digital transitions included in the Industry5.0 is to ensure that people still lead purpose-driven and creative lives.(Elias G. Carayannis, 2022)

Industry 4.0 has contributed as benefit to the industry in the last 10 years; finally, industry 5.0 is getting witnessed. In this paper, there is a discussion of the industry 5.0 opportunities as well as limitations and the future prospects. Industry 5.0 is changing paradigm and brings the resolution since it will decrease emphasis on the technology and assume that the potential for progress is based on collaboration among the humans and machines. The industrial revolution has potential to enhance customer satisfaction by utilizing personalized products. Industry 5.0 leads to competitive advantages while ensuring economic growth for the factory. Industry 5.0 concept is developing the efficiency of humans and machines appropriately. Challenges are deemed to create bottlenecks but the author has presented thoughts on how to manage the issues caused in industry 5.0.(Adel, 2022)

This paper discusses around the world of technology & mass customization leading to rapid transformation. Robots are becoming even more important as they can now be coupled with the human mind by means of brain-machine interface and advances in artificial intelligence. The impact of Industry 5.0 on the manufacturing industry and overall economy is discussed by the author from an economic and productivity point of view, where it is argued that Industry 5.0 has the potential to generate jobs rather being a challenge to job creation.(Nahavandi, 2019)

3. OBJECTIVES OF THE STUDY

1. To understand the concept & significance of Industry 5.0
2. To study human centric approach associated with Phenomenon of Industry 5.0 and its influence on Entrepreneurship at large.
3. To recommend a model associated with Industry 5.0 and Entrepreneurship.

4. RESEARCH METHODOLOGY & PROCESS

Industry 5.0 and Entrepreneurship: Human Centric Approach is a descriptive article conducted with the help of secondary data. The secondary data was majorly collected from the e-sources. The aim of the study was to understand the concept & significance of Industry 5.0. It further aims to study human centric approach associated with Phenomenon of Industry 5.0 and its influence on Entrepreneurship at large. The Author recommends a model associated with Industry 5.0 and Entrepreneurship. The study encompasses the domain of Industry 5.0 & Entrepreneurship. The inferences are limited to the understanding of the author; hence the results are more indicative in nature rather exhaustive.

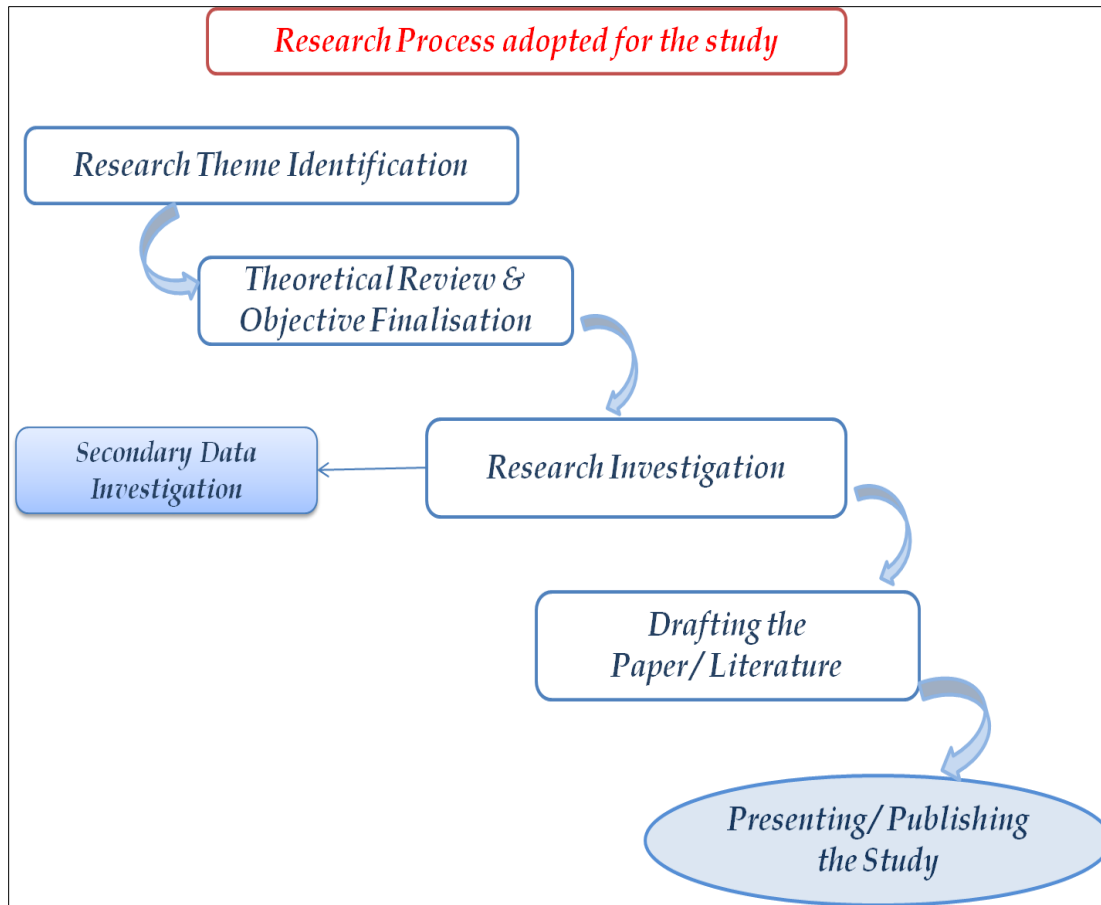


Chart No.1: Research Process adopted (Source: Author's Study)

ENTREPRENEURSHIP

Entrepreneurship has always been the ask from the Society. The Entrepreneurs are Soldiers of the Economy. There have been various facets of Entrepreneurship. The Entrepreneurs are such individuals who have both these virtues. Entrepreneurship is the state of developing opportunities in the society by exploring the available resources in the society. Most certainly the Entrepreneurship Development is essentially, especially considering the universal competition and survival of Economies. The status has to improve further and shall only meet potential if startups are encouraged. Entrepreneurship Development may comprise of Economic, Social & Cultural, Personality, Psychological and to some extent Political factors. Entrepreneurship is supported by various theories. One of such theories is proposed by David C McClelland, behavioral Scientist of USA. McClelland stated that high need for achievement is found as the dominating factor as against the other two kinds of Needs i.e., Need for affiliation and Need for Power in case of Entrepreneurs. All Innovations, Inventions & discoveries possibly relate to some extent with this theory of high need for achievement as till the time you do not aim to acquire high up results it will be tough to meet expected outcomes. Innovation is

an instrument of Entrepreneurship says Peter Drucker. As per Drucker, Innovation and Entrepreneurship are interwoven and one grows on the other. Commencing a new business is an innovation and the individual responsible to create that innovation successfully is the entrepreneur.

Industry 5.0 has a huge dependency on the characteristics of the Entrepreneurs. Any Concept that applies to the industry at large, the Entrepreneurs will have to be well versed. Right from Industry 1.0 to Industry 5.0, one of the integral aspects of the revolution is the emerging mindsets of the Entrepreneurs. They need to run the show and hence need to understand every facet of the Industrial revolution. Industry 5.0 focuses on the human centricity. It is more of Human involvement through technology. Example the advent of Robots is by Human and it will be managed by the Humans. Hence just creating Robots was more of Industry 4.0, however managing the same for greater output is Industry 5.0. Entrepreneurs need to manage the revolution.

INDUSTRY 1.0 to 5.0 – THE JOURNEY

The journey of Industrial revolution from steam power via electrical power to Robots & Cobots have been very impressive and inspiring. Right from mid 1700s to current date, the Industrial

revolution has witnessed 5 phases with current on being the Industrial 5.0. The term Industry 5.0 refers to human working with robots and smart machines. It's regarding the use robots by humans to work better and faster by enhancing technologies like the Internet of Things (IoT) and big data. Although defining "Industry 5.0, may be critical and difficult yet it can be attempted

as the future stage beyond Industry 4.0 where even more advanced technologies will be integrated into industrial processes. The Fifth Industrial Revolution, or 5IR, encompasses the value of human-machine collaborations, with a specific focus on the well-being of the multiple stakeholders (i.e., society, companies, employees, customers).

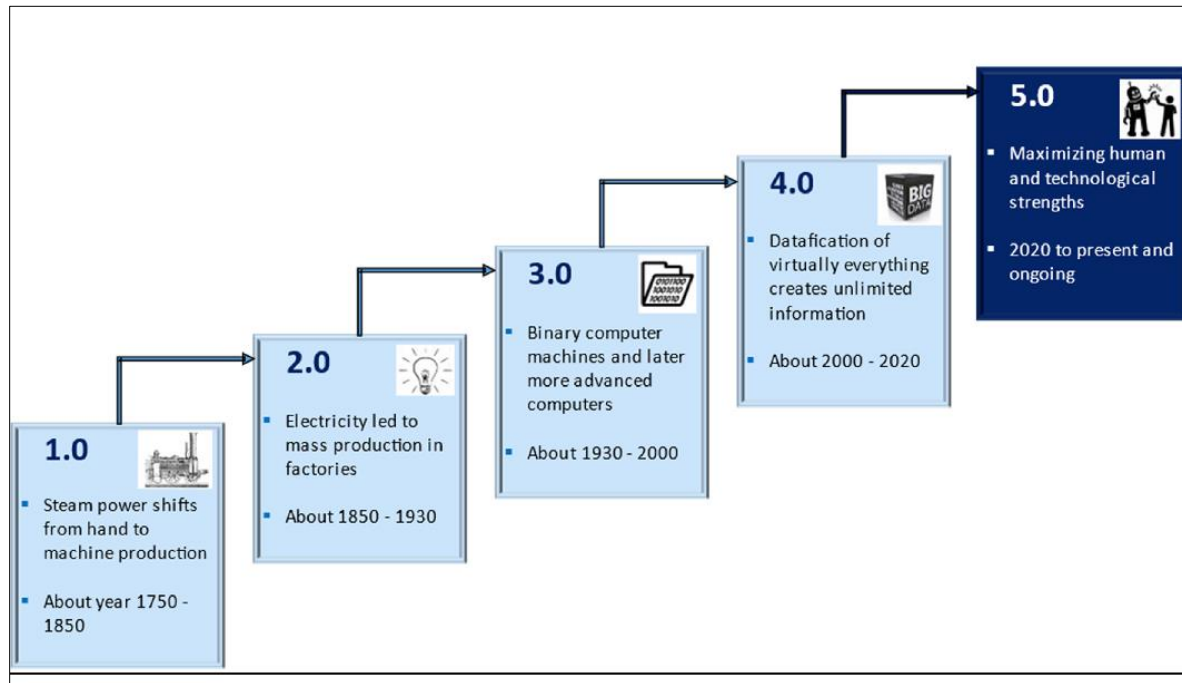


Chart No. 2: Journey of Industrial Revolution (Source: <https://appinventiv.com>, 2024)

INDUSTRY 5.0 – HUMAN CENTRIC APPROACH

Industry 5.0 is referred to have human centric approach whereby the Industrial domain experiences its Men collaborating with Machine. Industry 5.0 is fundamentally reshaping phenomenon of emphasizing people over technology. Industry 5.0 aims to address the real-world contemporary issues. Industry 5.0 aims to integrate AI, Automation, and Robotic technology into manufacturing production processes, while enabling decision making for workers. The industry 5.0 transforms process and integrates the same with human influences. It focuses on the human-machine collaboration, enhancing safety and job satisfaction for Employees. Industry 4.0 works on automating processes. It focuses on improving the efficiency on Machine front, however the industry 5.0 focuses on human intervention and centricity. The COBOTS are the industry 5.0 approach where by collaboration of the Machin with human is emphasized. Also, the world has experienced increase in environmental pollution however as against the past the industries have developed improvised processes to curtail pollution. The Entrepreneurs need to Cautious on Environment front as it is a statutory requirement. The

Entrepreneurs having the environmental awareness is often leads to a competitive edge and creates a rapport with international organizations like the UN, WHO. While Industry 4.0 didn't address on environment front but it is expected that the solution may come out of Industry 5.0. The industry 5.0 has its own share of challenges. One of the primary challenges of Industry 5.0 includes the Skills Gap. Entrepreneurs need to Integrate workforce into advanced Technologies processes requires a skilled workforce. It has been identified that there is a growing skills gap in fields like robotics, AI, and data analytics. The Edupreneurs, who are running the academics have the onus of bridging this gap. It is the social sustainability values of Industry 5.0 that involve promoting human-centric approaches to place fundamental human needs and rights at the heart of the industrial economy, promoting social development, employment & equality. The benefits of the industry 5.0 in the form of Increased Efficiency & Productivity, Improved Safety, Enhanced Quality Control, Cost Reduction, Sustainability approach have attracted the Industrial domain.

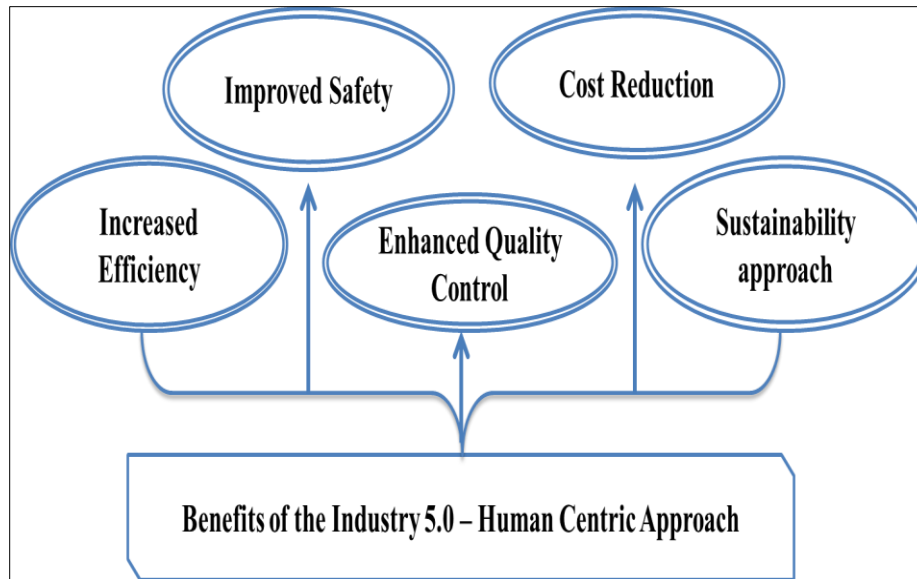


Chart No. 3: Benefits of the Industry 5.0 (Source: Author’s Study)

5. RECOMMENDATION

The Author understands that the industry 5.0 is at its nascent stage. Some of the leading implementers include Companies like ABB, Honeywell International Inc, 3D Systems, Rockwell Automation, Siemens, Emerson Electric Co. etc. These companies believe on launching innovative products, collaborations & expansions. The European Commission suggests that “Industry 5.0 recognizes the power of industry to achieve

societal goals beyond jobs and growth to become a resilient provider of prosperity, ensuring that production respects the limits of our planet and placing the well-being of the industrial worker at the center of the production process”. The Author here in contributes a Recommendary model stating the industry 5.0 as solution provider. The Companies adopting this model shall benefit in long run with advanced technologies adoption and implementation of technological plans.



Source: Industry 5.0: A Strategic Advantage for Companies, Adeline de Oliveira, Writer and editorial manager(<https://appinventiv.com>, 2024)

The Author also extends a self-designed recommendary processes of implementing the industry 5.0 by Entrepreneurs based on the

fundamentals of Workforce Adaption, Standardization, Data Security & Privacy and Ethical Considerations.

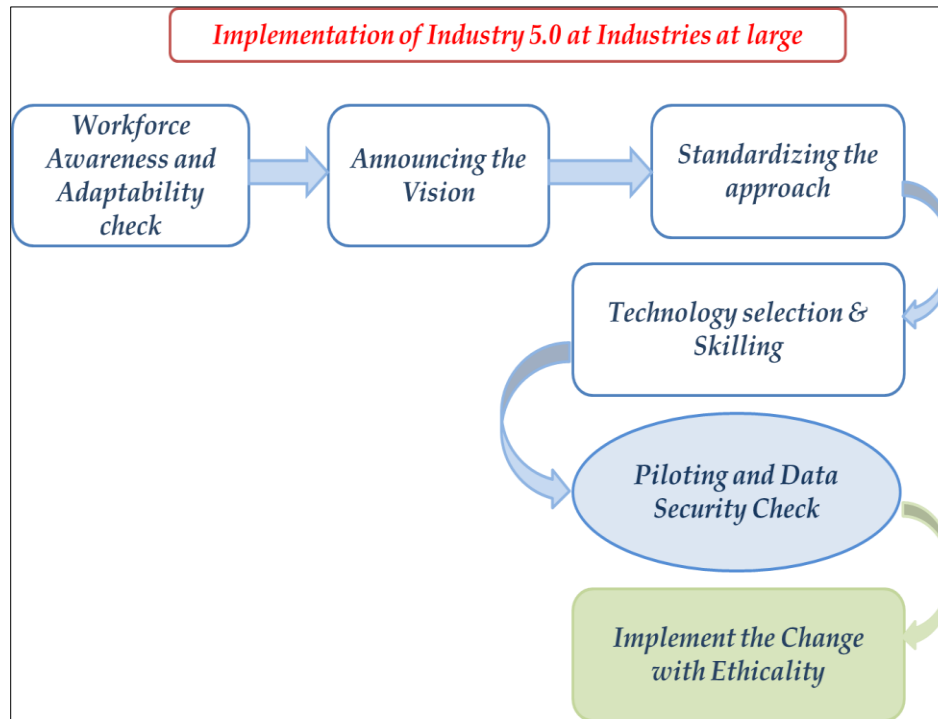


Chart No. 4: Implementing Industry 5.0 (Source: Author's Contribution)

6. CONCLUSION

Industry 5.0 emphasizes on the human-centricity, resilience, and sustainability acting to be the connect between man and machine. Industry 5.0 promises economic, technological, social, and environmental benefits, positioning organizations as pioneers of a new industrial era. It is imperative for sustainable growth and competitive advantage, offering a solid foundation for future success and contributing to creating a better world. Industry 5.0 certainly has significant benefits to its credit. The Successful implementation of Industry 5.0 at Organizations certainly entails a strategic approach that comprises of organization's current state assessment, adopting a clear vision, investing in training and skills development, involving suitable technologies, and emphasizing cybersecurity to ensure a smooth transition. The Benefits of the Industry 5.0 - Increased Efficiency & Productivity, Improved Safety, Enhanced Quality Control, Cost Reduction, Sustainability Manufacturing. Industry 5.0 in a sense allows humans to intervene where required and moves away from excessive automation to incorporate critical thinking and adaptability, while still taking advantage of the precision and repeatability of machines.

7. FUTURE SCOPE OF THE STUDY

The current study is descriptive in nature and primarily completed with the Secondary data. Such projects have prominent future scope in the form of:

- Collecting Primary data associated with the domain of the project. In case of this study the primary data collection will be in the form of surveying the technological giants and seeking their inputs through interviews.
- Qualitative research will derive enhanced results of actual implementation of the industry 5.0.
- Analysis pertaining to the human development at the Organizations who have adopted the industry 5.0 practices shall further derive results on 5th Industrial revolutions impact on Industries.

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