

Emergence of Educators for Industry 5.0 - An Indological Perspective



Abhay Saxena, Durgesh Pant, Amit Saxena, Chandrashekhar Patel

Abstract: In the amid Covid-19 crisis where the world is suffering from the pandemic, the technology is ready to march forward with the new vision, concepts, and principles. The Covid-19 crisis gave humanity the new mantras of wisdom, contentment, value of products, large family concepts, and the exponential growth of the mind with a human touch. Industry 4.0 was the emergence of Industrial Internet of things where automation, Machine Learning, connectivity and real time data had been woven together. This paper deals with the Vision of Industry 5.0 leading toward Society 5.0. The smart society will be equipped with new version of education and educators 5.0, who are likely to lead the world. The humans will be equipped with Smart Collaborative and co-operating Robots to efficiently perform the undertaken tasks. This new Super-smart society will be enriched with 'Human Touch', personalized products. The New Education Policy (NEP) 2020 in India, is focused on the concepts of Education 5.0. This paper will also introduce the new horizons of the education system in terms of Indological Perspective. It also gives an insight to the methodologies and techniques that are required for achieving the Goals and Objectives of Society 5.0.

Keywords: Society 5.0, Industry 5.0, Education 5.0, Cobots, Indological perspective.

I. INTRODUCTION

The world is witnessing a great tide of Change, Transformation, Digitalization, and Industrialization that is influencing the society in various aspects including public administration, industrial structure, employment, and privacy of an individual. The transformations taking place will cause a societal shift from Society version 4.0 to 5.0. (Rada, 2018) talked about Industry 5.0 is future, closer cooperation between man and machine. (Nahavandi, 2019) emphasized, Industry 5.0 will be a synergy between humans and autonomous machines. Enhancing Industry 4.0 traits, Society 5.0 would be a super-smart society equipped with problem-solving & value creation ideology, diverse abilities, decentralization, resilience, and sustainable development. Society 5.0 is the 'Imagination Society' where

Industrialization will be the core factor of transformation and technological advancements. Society 5.0 will emerge with the concept of Industry 5.0 causing industrial revolution that will be further empowered by Education 5.0, in turn, generating the high definition Educators 5.0.

A. Tracing Back The Industry Revolutions:

Tracing back the origin of Human beings from Hunter-gatherer Society (Society 1.0) that was evolved into agrarian society (Society 2.0) that were primarily dependent on agriculture, which was further advanced into the Industrial Society (Society 3.0) from where the series of Industrial revolution came into existence (Kagermann, 2016). The first Industrial Revolution in the 1780s (Industry 1.0) introduced mechanization from steam, water, and fossil fuels. The second industrial revolution in the 1870s (Industry 2.0) was focused on electrical energy that favored mass production, which was proceeded by the third industrial revolution in 1970s (Industry 3.0) where it introduced new horizons of advancements like automation, information technology, electronics and IT systems which lead to the emergence of the Information Society (Society 4.0). The fourth industrial revolution (Industry 4.0) which further expands the Information society, is also known as a hyper-connectivity revolution as it provides a real-time interface between the virtual and physical worlds called Cyber-Physical Systems and other technologies like IOT (Internet of Things), IOE (Internet of Everything), Big Data, AI (Artificial Intelligence). Although Industry 4.0 is not yet well grown, the world is looking forward to the next industrial transform (Industry 5.0), autonomous manufacturing with Human Intelligence, which will, in turn, lead to the Emergence of Super-Smart society (Society 5.0) as in figure 2.

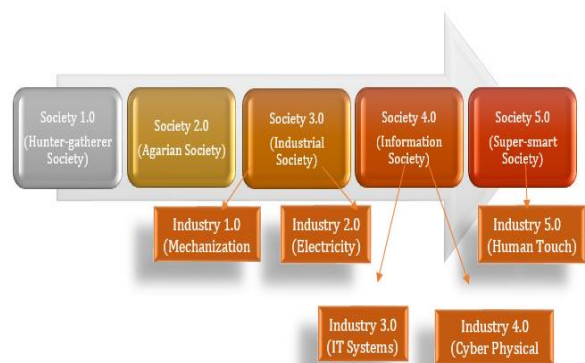


Figure 2. Industrial Revolution in the context of Societal Revolution

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II. BACKGROUND

Heraclitus preached rightly, “The only thing Constant in this World is Change”. The human nature always tries to find out a better solution for every pre-existing problem. Registering the revolutionary path, one can trace out the demanding, transforming, and acclimatizing nature of the human through which the Industrialization took place.

In the same context, where digitalization has paved a new way for manufacturing (industry 4.0) - where factories are becoming more smarter and sophisticated with the help of technologies like IoT, automation, robotics, sensors, data science, advance analytics, artificial intelligence. These advancements introduced some drawbacks like complex & expensive software, deployment challenges, security leaks, need for highly skilled professionals and main concern is that humans are being replaced rather than being equipped.

Industry 5.0 has overcome these hurdles, by introducing a paradigm shift from Digitalization to Personalization, where it will highlight the new concept of ‘Human Touch’ (figure 3). This revolution would solve the necessity for personalization, would stimulate and apply human intelligence in computers called cognitive Computing. The crucial transformation that will emerge, is that humans would be equipped & integrated with intelligent automation, devices, and systems for better co-operation and collaboration with the machines rather than being replaced. Industry 5.0 will lead towards society 5.0, which will be a Super-smart society. This Super-smart society will form the advancement in the field of education, causing a paradigm shift from Corporate education to Incorporate values in Education, by introducing the concept of Education 5.0. The Education 5.0 emergence highlights the skills like communication, leadership & endurance, curiosity, comprehension, critical and creative thinking. To fulfill the objectives and motive of Industry 5.0 we need to enhance and empower common education with the High Definition Educators, Cobots (Collaborative Robots), which in turn would enhance the Personalization in Society 5.0 and make it a Human-Centered Society.



Figure 3. The paradigm shift of Industry 4.0 to Industry 5.0

III. ROLE OF INDUSTRY 5.0 IN EDUCATION 5.0

Japan defines Industry 5.0 as ‘Society 5.0’ a ‘human touch’ revolution (Harayama, 2017): “A human-centered society that balances economic advancement with the resolution of social problems by a system that highly integrates cyberspace and physical space.” where

digitalization would not make humans obsolete in the transformation process. Instead, it would help skilled workers and highly-skilled professionals to guide smart machines and robots, establishing a co-operative and collaborative workspace integrated with the perfect combination & interaction of Cognitive Computing and Human Intelligence.

Industry 5.0 would bridge up the gap between robots and highly-skilled workforces to produce and deliver the best-personalized services to the customers. As highlighted that Industry 5.0 will demand highly skilled professionals and workforces to efficiently fulfill the Goals and Objectives of Society 5.0.

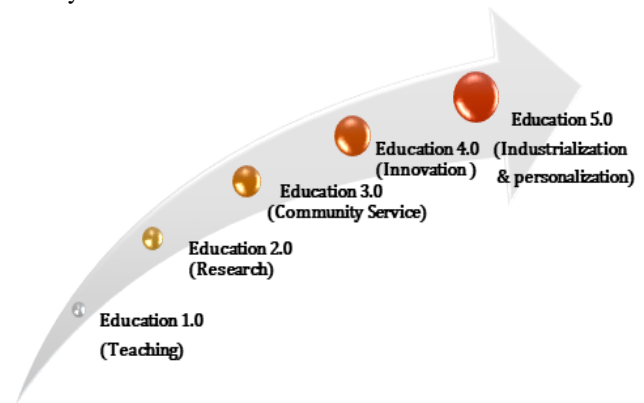


Figure 4. The Evolution in the Education System

Education 5.0 will enable an individual to master the skills like learn, unlearn, and relearn to adapt and embrace the ever-changing environment of the technical World (figure 4). The Education 5.0 would be personalized, which would enhance the learning process and prepare students to endure and confront the uncertainties in the future with their enriched skillsets that will allow them to sustainably create new values and services to benefit and balance a society as a whole.

To educate the students with the latest skills and upscaling their standard of thinking, there arises a need for High Definition Educators, Educators 5.0. These educators will be able to stimulate and apply human intelligence and thought processes in the computer would work in a collaborative environment with humans, hence called as Cobots (Collaborative Robots), which will enrich the learning process in Society 5.0.

IV. EDUCATION SCENARIO IN INDUSTRY 5.0:

A. Physical Conscious World:

- 1) The recent development of Machine learning had made the machine even more smarter and effective. The notion had changed completely from cyber physical world to physical conscious world. The machine awareness towards the environment is rapidly changing. The constant data set of human knowledge is helping it to grow. The process- concept, design and implementation is making it more effective. The deliverance is undoubtedly magnificent. The readiness of the product is just flawless.

The big question is what more the machine needs? And the simple answer is human touch. This is a segment where the machine is missing the bus.



Industry 5.0 will lead the process of manufacturing and production comparatively easier than before, enriched with quality assurance and precise & timely deliverance, that magnifies the readiness of product. Equally the education scenario will be revamped through the equipped cognitive machines (Cobots) in industry 5.0. Here the machine has interaction with human beings. It is important to notice that machine will provide human touch or personalization of the product for Industry 5.0.

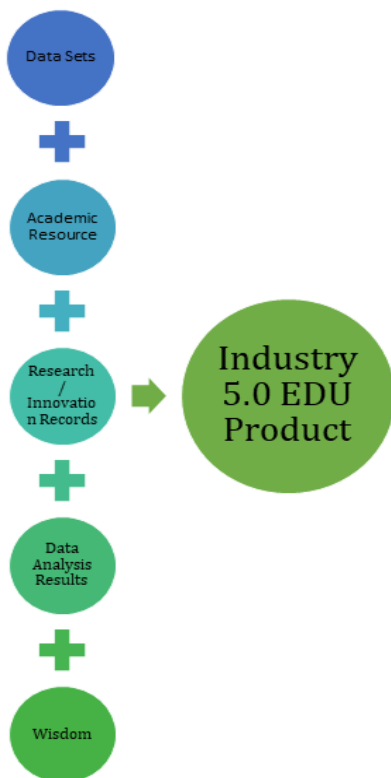


Figure 5: The Educational Product of Industry 5.0

A. Personalized Education:

The personalized education will produce highly skilled professionals, that can adapt and satisfy the ever-changing Industrial demands and generate Industry 5.0 education products. The Education 5.0 will be a Personalized Education System, where the knowledge datasets will combined with the academic resources, which owns the Research & Innovation records owning the property of Automatic Data Analysis and when this all combination will be integrated with Wisdom, it will shape into Industry 5.0 Education Product (figure 5).

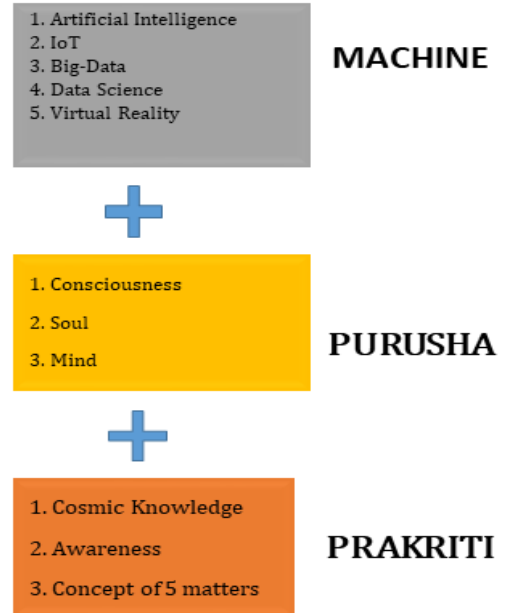


Figure 6.0: Redefining Sankhya Darshan in the perspective of Education 5.0

We all are familiar with the tradition of Vedic education system, India where the concept of Guru, Gurukul was very strongly established. The wisdom based Guru transfer all his knowledge into his disciple with the help of Shruti, Smriti, Shaktipath and other writing works. One can easily explore the immense vedic treatise i.e. Vedas, Upanishads, Purans etc. We herewith suggest that a similar traditional educational knowledge if imparted into modern education system, the results will be amazing. One of the darshan tradition of Vedic Science is Sankya Darshan which talks of Prakrti and Purush. This is already established into modern education system.

The machine intelligence is undoubtedly at par as it is equipped with modern technologies like AI, IoT, Big-data, Data science, and VR. Moreover if this machine will possess the Purusha Tatva (figure 6.0) i.e the master of consciousness, soul and mind and the Prakriti i.e. the combination of cosmic knowledge, awareness about the environment and celestial objects and the mastery of Panchtatva (5 phenomenal matter of human existence - i.e. Ether (Akash), Wind (Vayu), Fire (Agni), Water (Jal) and Earth (Prithvi). A mastero machine equipped with human intelligence and this is how we will find the Industry 5.0 products. It will surely contribute to the creation of New Society 5.0.



V. METHODOLOGY:

The Methodology will contain what education 5.0 will require and what are the things necessary for effective communication between Cobots and human being? (Rada, 2018) had clearly defined the Cobots existence and effectiveness. Now question is how we can use this cobots into education 5.0?

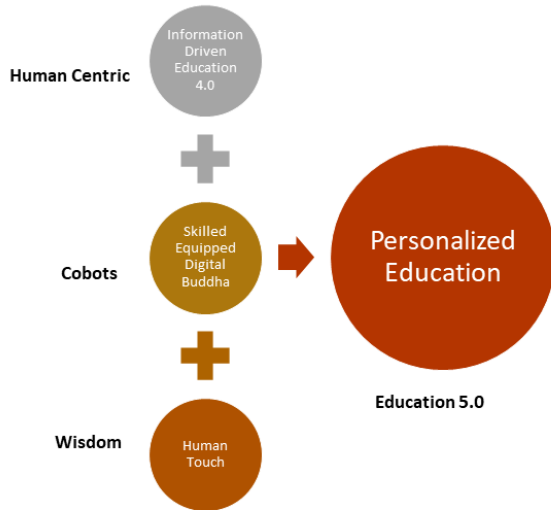


Figure 7.0 Inclusion of Cobots in Education 5.0

The modern Education 4.0 is fuelled with Information and if it can be skilled and equipped with digitally Smart machines, (we are calling them as Digital Buddha) or Cobots, which will be further enriched with Human Touch will lead society on the path of Personalized Education (Figure 7.0). In turn, the Human centric society will be created with Cobots and will be enhanced with human wisdom empowering the Education 5.0, the personalized Education for all. We are not professing that Society 5.0 will be for machine only or the loss of human existence. Our vision is that in Society5.0, Human beings will be assisted with many working Cobots to help them in day to day life functionality and to support in their personal and professional growth.

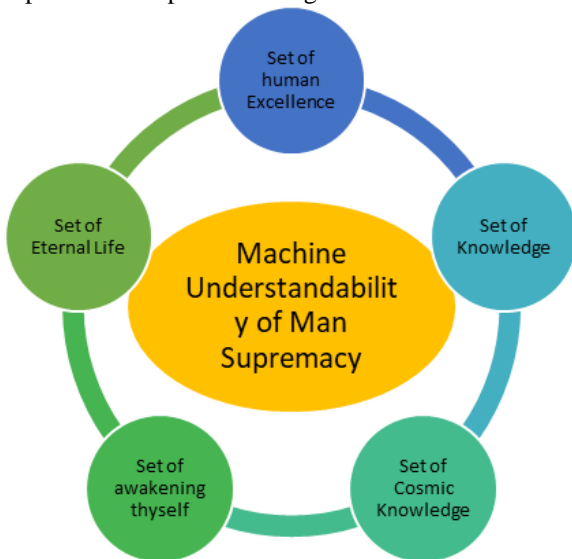


Figure 8.0 : The aspects which machine needs to learn from Human being

The effective Cobots or educators 5.0 are likely to serve the society5.0. They will lead the education with a transformed vision but the question is what are the aspects that Educators 5.0 must learn? They must possess the basic Understandability of Man Supremacy. Educators 5.0 machines will be equipped with Human Endurance, Knowledge Treatise and the with valour of exploring the unexplored. Who knows the machines will own a dream of Awakening Thyself? Who knows the Machines will possess a vision of Eternal Life? Hope it will be addressed with the more exploration and knowledge set of Intelligenstia.

VI. CONCLUSION

The Super-Smart Society, Society 5.0, will be the Human Centric society where the machines with cognitive excellence would work in co-operation and collaboration with humans. For the development of the visionary society there is a need of Education 5.0 that would be executed and implemented by the Educators 5.0. The Educators will be the Cobots (Collaborative Robots), which will be chipped with machine centric Knowledge, learned in human supremacy, trained in human personalization and mastered in qualitative deliverance based on learner's need & capacity. This highlights the Paradigm shift from Value of Corporate Education to Incorporate values in Education. For the Strong base of Industry 5.0, the Education 5.0 is must that would only be possible with the Smart and high definition Educators. The Challenge for modern educators is, either get prepared for this revolutionary change or take renunciation (sanyasa).

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