



Society 4.0: A Connected World in Flux

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1. INTRODUCTION

The Fourth Industrial Revolution (4IR) delineated by the convergence of a cluster of technologies segregating across the physical, digital and biological worlds- machine learning, artificial intelligence, advanced robotics and autonomous transport, cloud computing and the IoTs among others is expected to extensively transfigure the future of work. It will change employment and the nature of work. It is likely to escalate forces of corporatization as, arguably, only large corporates will have the data literacy, computing power and connections to generate the data used to report on and automatedly organize the digital economy. This leaves civil society and potentially the achievement of 'a good society' vulnerable.[1] Artificial Intelligence, Big data and Internet of Things work together to formalize a society that is coined as Society 4.0. The Society 4.0 comprises the human, social and cultural implications of emerging technologies like artificial intelligence, biotechnology and autonomous systems.

The use of AI and digitalization will change the world and we as human need to think mindfully the social outcomes to ensure that digitalization should have positive impact on society enabling to solve the problems around energy, communications and transport.

Big Data is "things one can do at a large scale that cannot be done at a smaller one, to extract new insights or create new forms of value, in ways that change markets, organizations, the relationship between citizens and governments, and more" (Mayor-Schonberger & Cukier, 2013, p.6). Chui, Loffler, and Roberts (2010) define the Internet of Things (IoT) as "sensors and actuators embedded in physical objects- from roadways to pacemakers-[that] are linked through wired and wireless networks, often using the same Internet Protocol (IP) that connects the Internet". IoT captures data that AI can organize into big data. This paper will look at the impact of Society 4.0 on human generation, organizations and the nature of work and the ability of the businesses to be future ready for the automation of the work that humans have done. The first section will look at the change in nature of jobs because of advent of Society 4.0 and change in the nature and the type of job and infrastructural requirements to absorb the change, the

second section will look at the affect of Society 4.0 on technological adaptability by the way of living. The third section will discuss about the smooth transition of Society 4.0 to Society 5.0.

2. LITERATURE REVIEW

In combination, AI, big data and IoT provide instant, detailed information about current and potential customers' needs and preferences that then feeds new product ideas. They produced robots that can replace humans in manufacturing, restaurants, retail and banking. They produced IBM's Watson that can sift through millions of pages of research in seconds to provide doctors information about diagnosis and treatment options that will result in better, mor affordable healthcare (Kaplan, 2015), and Google's Deep Mind program that can read lips more accurately than human lip readers (Chui, George, & Miremadi, 2017, p.1). In finance, "Automated trading algorithms are now responsible for nearly two-thirds of stock market trades" (Ford, 2015). In customer service, Amazon is piloting Echo Look that will have a camera and microphone and will give you feedback on how items of clothing look on you. In products, 3D printing is printing a toupee that is a biomaterial scalp prosthetic that matches skin and hair color plus hair curl and thickness. Chui et al. (2016) argue that today's technologies could "automate 45 percent of the activities people are paid to perform" and "about 60 percent of all occupations could see 30 percent or more of their constituent activities automated, again with technologies today". [2]

Advanced digital technology is already used in manufacturing, but with industry 4.0. It will transform production. It will lead to greater efficiencies and change traditional production relationships among suppliers, produces and customers- as well as between human and machine.

The 'Future of Jobs in India- A 2022 Perspective' report provides a vision of change I the Indian job market over the next few years. It identified three primary forces behind the current disruption: globalization, adoption of exponential technologies by Indian industry and demographic changes. The interplay of these three primary forces is giving rise to a range of twelve mega trends which are shaping the future of jobs in

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India. The survey responses indicated rising middle class, creation of highly optimized supply chain and launch of smart connected products and services the top mega trends significantly impacting the job landscape in India.[3]

Recent studies estimate automation potential in India ranging between 52 and 62 per cent, based on the task content of various occupations (McKinsey & Company, 2017) [4]. The impact of automation on jobs could be even greater if considered in terms of skill levels. The NSSO data reveals that less than 20 per cent of the population is engaged in high-skill occupations that typically require advanced analytical skills and are thus less vulnerable to the impacts of automation (Social Science Research Network, 2017) [5].

The dynamic advances in technology paired with all types of cross sector innovations, is creating increasing concern about the possible adverse society impact, such as increasing inequality, and the diminishing of jobs. While we cannot be truly sure about the consequences and the type of society that will arise from complicated changes to the work of work, we can touch on some significant trends. This can be countered by adopting the concept of Society 5.0, which will emerge with three major elements as a core conspectus-intelligent device, intelligent system and intelligent automation-fully merge with the physical world in cooperation with human intelligence. The term “automation” describes autonomous robots as intelligent agents collaborating with humans at the same time in the same workforce. Trust and reliability between these two parties will achieve promising efficiency, flawless production, minimum waste and customizable manufacturing.[6]

3. AUTOMATION AND FUTURE OF HUMAN WORK

The intensity of Automation technologies displacing workers will depend on the rate of their development and adoption, economic growth, and growth in demand for work. As it results in receding in some occupations- 60percent of occupations have at least 30% of constituent work activities. By 2030, the proportion of work actually displaced will likely to be reduced as a result of technical, economic and social factors that affect adoption. With improvement in technology, advanced economies are more affected by automation than developing ones, reflecting increase in wage rates and hence automation in economic incentives. Even with automation, the demand for work and the workforce could increase as economies grow, proportionally fueled by productivity growth empowered by technological advancement. Uprising incomes and consumption specifically in developing economies, improving healthcare for aging societies, investment in infrastructure and energy, and other trends will induce demand for work that could help cease the displacement of workers and additional investment. Major transitions are expected in the scale and nature of work in the field of agriculture and manufacturing. According to Mckinsey report 2017, “By 2030,

75million to 375million workers (3 to 14% of the global workforce) will need to switch occupational categories. Moreover, all workers need to adapt, as their occupations evolve alongside increasingly capable machines.” The adaptation to the nature of work will require higher educational attainment that results in high-level cognitive capabilities that are hard to automate.

Getting India ready for the future jobs

- Workers with the lowest levels of educational attainment are at greater risk: -

Exhibit E10, “Employers’ opportunities and challenges depend on company footprint and workforce characteristics.” Source: Mckinsey Global Institute analysis.

Connecting workers with opportunities, a central challenge in the automation age will be connecting millions of displaced workers to new, growing jobs. Some may need to change jobs within the same company, and employers would provide the necessary training in these situations. But many workers may need to switch employers or make even bigger moves to different occupations in new locations.

In a more technology-driven world, job-matching efforts can be aided by a range of new digital tools and should run on easily accessible digital platforms. New online tools can access an individual skill, suggest appropriate career choices, and clarify which jobs are in demand and the credentials needed to obtain them. Many efforts are underway to centralize and standardize information on skills, job porting and credentials.

Local business leaders, policy makers and educators will need to work together to chart a new course.

- Reskilling and upskilling of Workforce: -

Automation means that the industry skill requirement is constantly evolving. Older skills are becoming redundant and are being replaced with new tech-driven skills. Being a professional in today’s business ecosystem is, thus, an iterative process of learning, unlearning and re-learning. As new and higher-level skills are in demand, including not only digital skills but also critical thinking, creativity and socio-emotional skills. The old model of front-loading education early in life needs to give way to lifelong learning.

Employers will be the natural providers of training and continuous learning opportunities for many workers. Many workers who need to switch employers or change occupation will need training options outside the workplace. Industry-specific training programs delivered through local educational institutions that result in job placements.

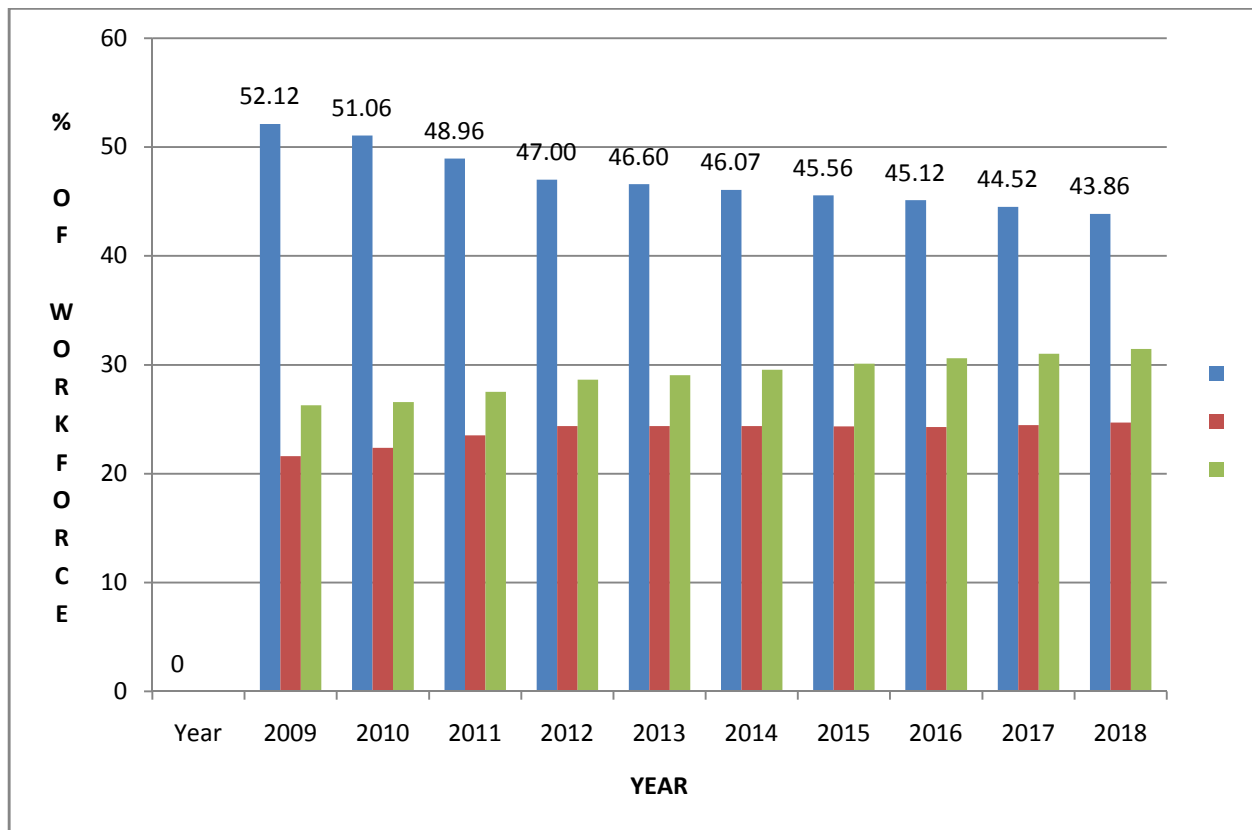
- Formulating customized economic development strategies: -

Indian economy faces economic development issues that need to be solved at the local and regional level. Preference may vary across different community segments and hence required more tailor’s strategies. For metro cities and high-growth hubs requires connecting disadvantaged populations with new opportunities, adding affordable housing, and improving transportation. The communities in the mixed middle segment need to accelerate economic growth and focus on entrepreneurship and skills development. Rural places lack the economic base or the inflows of investment or people to create new jobs. Lack of economic activity can not be addressed by workforce retraining. Each community will have to take inventory of its assets, such as available industrial space, natural attractions, local universities, and specialized workforce skills. This can act as a basis of an economic

development plan built around growth engine industry that can create jobs and deluge effects. The next step in the chain is attracting investment, subsidies and tax incentives can act as tools if used wisely under of a business care.

- Supporting workers’ in transition: -

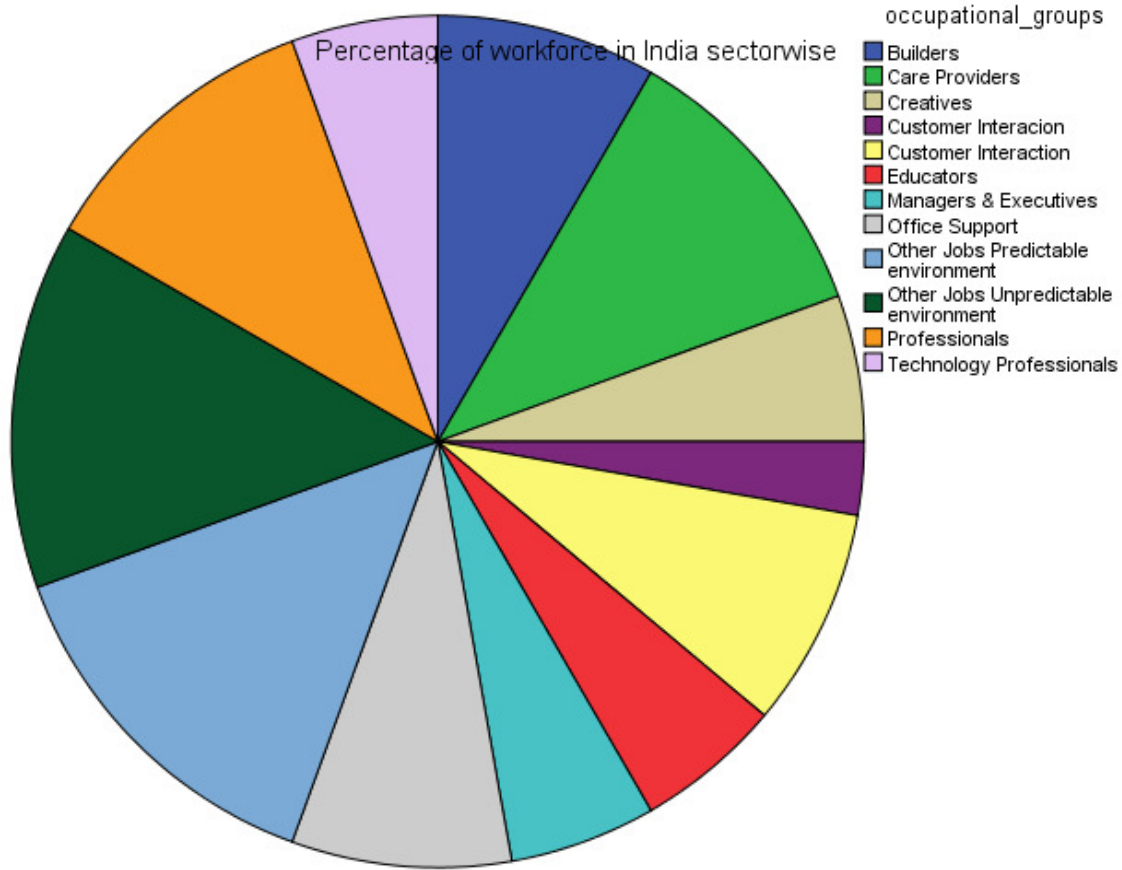
In era of technological change, India need to look at advancing and powering the social safety net to support people transitioning between jobs. Supporting people looking for transition by longer and more flexible income support programs during periods of unemployment, relocation assistance, training grants and earned income tax credits. Portable benefits attached to the worker rather than the employer may offer stability to people, need to switch between opportunities and geographies. Omni-present benefits for full-time, part-time, and independent worker, could be prorated so that contributions are tied to hours worked for different employers.



Source: www.statista.com

Maximum workforce is employed in other jobs with predictable environment and other jobs with unpredictable environment and customer interaction. Indian workforce working in agriculture is declining overtime .Millions of workers have indeed left farm jobs for non-farm jobs, and the

pace of this transition seems to have picked up since the mid-2000s , When the economy’s growth engine also picked up pace. Growth in industrial sector is almost stagnant but service sector is showing an upward moment holding a promise to open new promising areas for future growth.



Source: US Bureau of Labor Statistics; Mckinsey Global Institute analysis

The potential impact of automation on employment varies by occupation and sector. Activities most susceptible to automation include physical ones in predicable environments, such as operating machinery and preparing fast food. Collecting and processing data are two other categories of activity that can increasingly be done better and faster with

machines. This could displace large amounts of labor, for instance in mortgage origination, para legal work, accounting, and back-office transaction processing. In future few takes will be automated, employment in these occupations may not decline, but rather workers may perform new tasks.

% change(+/-) step -up Labour demand, Mid point automation	Occupational Categories	Occupational Groups
>=100	Doctor	Care Providers
>=100	Nurses, physicians assistants and pharmacist	
>=100	Childcare worker	
50 to 99	Community & School worker	Educators
>=100	School Teacher	
>=100	education support worker	

% change(+/-) step -up Labour demand, Mid point automation	Occupational Categories	Occupational Groups
50 to 99	Executives	Managers & Executives
50 to 99	Managers	
25 to 49	Accounts managers	
50 to 99	Engineers	Professionals
25 to 49	scientists & academics	
-15 to -24	Legal support workers	
>=100	computer engineer	Technology Professionals
50 to 99	computer specialists	
50 to 99	Architects, Surveyors and cartographers	
>=100	Construction Workers	Builders
25 to 49	Crane and tower operators	
50 to 99	Artist and designers	Creatives
50 to 99	Entertainers/Media	
>=100	Personal care workers	
>=100	Food serving workers	Customer Interaction
25 to 49	Sales workers	
5 to 24	hotel & travel workers	
50 to 99	computer support worker	Office Support
5 to 24	financial worker	
25 to 49	administrative Assistant	
25 to 49	production worker	Other Jobs
5 to 24	material moving machine operators	
-5 to -14	Agricultural graders & equipment operators	
5 to 24	Food Preparation workers	Predictable environment
5 to 24	General mechanics	
>=100	Specialized mechanics and repair	Other Jobs Unpredictable environment
5 to 24	Emergency first responders	
25 to 49	machinery installation & repair worker	
-5 to -14	Agricultural field worker	
50 to 99	Building and grounds cleaner	

Automation will have a lesser effect on jobs that involve managing people, applying expertise and those involving social interaction, as behavioral human element plays its cognitive role and machines are unable to match human performance for now. Jobs in unpredictable environments- occupations such as gardeners, plumber or providers of child- and- elder-care will also generally see less automation by 2030. These type of jobs are difficult to automate technically

and often command relatively lower wages, which makes automation a less attractive business proportion.

4. TRANSITION OF SOCIETY 4.0 TO SOCIETY 5.0

Society 5.0 or the road to the super-smart society turned out to be paved with an important role for technologies in areas such as IoT, AI, cyber physical systems, VR/AR, Big Data but it's

not just about technologies. Society 5.0 concept is to “promote an increase of job mobility to create an environment where diversified and flexible way of working can be accepted and each and every person can play a lively part.” (keidanren outline)

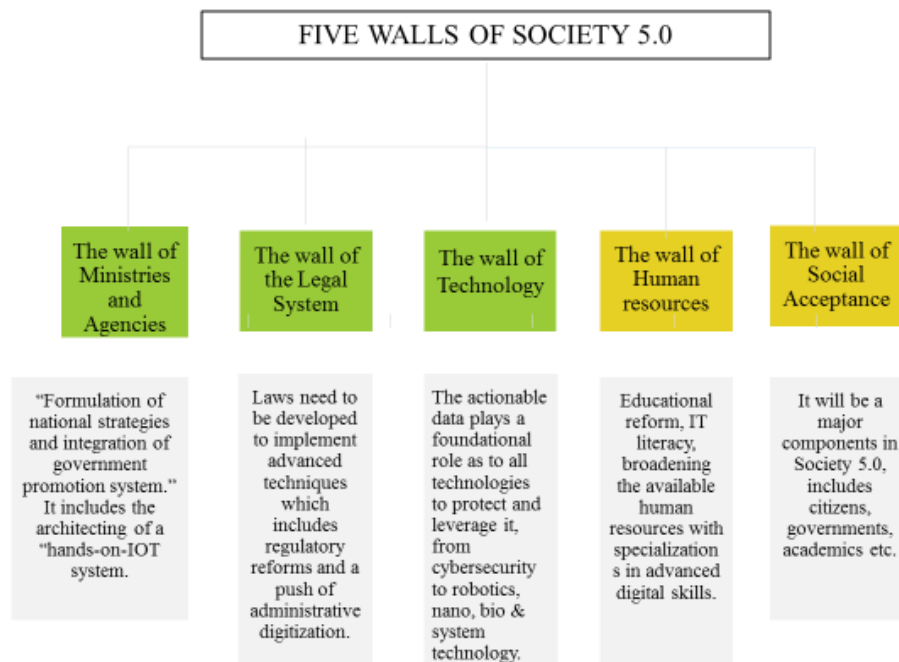
Society 5.0 is an idea that been developed mainly in Japan. It is about promoting user-friendly technologies for the daily living and a better human-machine interfaces. Better the seamless integration of human and machine, the better the ability to adopt technical innovation. Policy makers can encourage companies to provide more training for next-

generation manufacturing technicians to make a smooth transformation from one technology to another.

We are still in early stages of a major revolution in the place of work in our social lives, and it will take a long time for our societies to understand, let alone embrace the new meanings that will emerge from future social realities.

The evolutionary aspect of the society 5.0 concept as introduced in the 5th Science & Technology Basic plan of Japan- source keidanren paper.

The five walls to ‘break through’ in moving to Society 5.0



5. CONCLUSION

This paper examined the latest research on the dynamic workforce and future profession which acknowledged that automation will metamorphose the workplace in ways difficult to imagine. Entirely new jobs will come into the picture based on changing needs of human society and automation in most areas of human activity, some classic jobs that need basic human skills will resolute into the future. Government and business leaders will be liable to form customized policy framework with penetrating strategies, mainly reforming the educational system for the future, to adopt new reforms relating to transition to new digital age, i.e, Society 4.0 or transition of Society 4.0 to 5.0.

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