Technological Unemployment: Artificial Intelligence, Automation and Unemployment in India

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Abstract— The impact of technological change on unemployment is a controversial matter. Artificial Intelligence and automation are destroying more and creating less jobs. The jobs of unskilled workers & labour are destroying by use of artificial intelligence technology and automation. Business models are changing in this competitive market. Business and industries are using technology to increases efficiency and performance of productivity. It also eliminates human errors and risk factor related to work. Because of this there is a negative impact of technological change on labour market and their wages. At the same time it is creating new jobs and opportunities for skilled workers. So people, employee and workers need to be flexible with technology and need to upgrade their skills to cope with demands created by technology.

Keywords: Technological unemployment, Technological change, Unemployment, Artificial Intelligence, Automation, Jobs

I. Introduction

According to economist John Maynard Keynes, "Technological Unemployment is the Loss of Jobs Due to Technological Change". Artificial intelligence, augmented and virtual reality, cloud computing, Internet of Things (IOT), intelligent mobile apps, big data, robotic process automation, machine learning etc a wave of modern technological change is immersing all of us. It is predicted by several institutions after analyzing these changes that the rapidity of technological change is difficult for all of us to update our skills. These rapidly technical changes are disrupting existing markets, organizations, products etc. New inventions like self-driven car and speech recognizing machines are about to replace human labour rapidly. Because of this, the rate of labour may change and level of unemployment will increase. This new trend known as technological unemployment. It refers to the loss of jobs caused by technical changes.

The rapidly new inventions and technologies like AI and automation have tremendously reshaped jobs and taken away certain jobs. Technology has not only affected the number of jobs but has also impacted the nature of jobs being created. Popularity of digital technology for communication in human life is one example. Organizations are using digital technology for reaching more customers faster than ever before. Organizations are beginning to understand the use of technology in upcoming market. E-commerce is suitable example for this. E-commerce is creating new jobs but it is not necessary that it will improve the labor market situation. It is indicating the fact that maintaining the ratio between the rates at which jobs are created and being replaced is not only objective of labour market experts. One reason behind is technological changes in organizations and rapidly reshaping the skills that employers seek. This gives negative impact to

jobs being replaced by technology and huge negative impact carry for labour market.

There are lots of reasons behind unemployment in India and one of them is adoption of technology especially for labour market. The other reasons could be less quality institutions, lacking required and upcoming skills to work with technology, creating jobs and opportunities to reduce unemployment rate, fundamental education, moving highly educated and skilled persons in other countries etc. Technology advancement supporters think that adoption of technology is an opportunity and it will create new jobs with changing business models.

II. Review of literature

Kristina Matuzeviciute, M. B. (2017) this paper describes the theoretical and empirical scientific literature about the impact of technological innovations on unemployment. Formers are considered as a main key driver of long-term economic growth and productivity. The period of data is 2000-2012 from 25 European countries used to find out affect of technological innovations on unemployment. For technological innovations as a main proxy triadic patent families per million inhabitants is used. System Generalized Method of Moments (SGMM) used to estimate other unemployment controls. Study found that there is no significant relationship between technological innovations and unemployment.

Gunkel, D. J. (2017) the study is about the impact of emerging technology on the future of employment. And it is found that one side of this transformation of technology and automation in industry will be temporary loss of jobs followed by overall gain and new opportunities will arise. The other side will be different, it will be according to Martin Ford (2015) "jobless future" and need to prepare for this. The effect of this will be on individuals credentialing and education. Recently published report by Pew Research Center, it is found that disagreement among experts towards impact of technology and automation on future employment opportunity. All respondents agreed on one thing that was need to rethink education. (Pew Research Center 2014, 55).

EDUARDO POL, J. R. (2017) the study desribes that robotization as an agent of social change and economic change has to consider for technological unemployment. This paper is focused on youth and effect of technological change on labour displacing. This conceptual study focused on technological unemployment and frictional unemployment among the young people. It shows that the young people facing unemployment problem, the possible reason could be inventions of new technology like robotics and artificial intelligence. It also describe the other reasons for that which is inevitability of technological unemployment and coping behavior.

Marc Saner, W. W. (2015) study show that analysis about technological innovations parallel with independent socio-economic innovations. Technological innovations offer important analytical advantages. The study is focused on socioeconomic innovations and trends that systematize education, skills requirements and culture. A highly systematize workplace is suitable for international outsourcing as wells as more suitable for machine labor. In this study five specific research questions are identified and introduced "functional equivalency" and "functional singularity" concepts. To provide semantic tools that emphasize the importance of an integrated approach, capable of tracking and analyzing two interacting and potentially converging trends.

Gilbert, R. (2014), in our highly polarized society, there is one thing that politicians across the political spectrum agree upon: The number one issue that concerns voters is the lack of jobs. More specifically, the lack of fulltime jobs that pay enough to provide individuals and families with a sense of security and the possibility for upward mobility, both of which are at the heart of the American Dream. Recently the government has been trumpeting a declining unemployment rate and the fact that we have created more jobs in recent years than were lost following the collapse of Lehman Brothers and the start of the Great Recession in September 2009. Unfortunately, while this makes a good talking point for political campaigns, it paints an overly optimistic picture of the economy and the labor market. The fact is, a large majority of the jobs that have been created in the past few years are either part-time or provide wages that are too low to enhance security or social mobility. For an accurate picture of the labor market, the government would need to focus on report of unemployment rate. Need to report the average number of hours worked per week, average hourly pay, the number of people who have stopped looking for a job entirely (and thus are not counted in the unemployment rate) and the percentage of the adult population that is working. When all of these statistics are examined, a more somber view of the labor market emerges, one that is more in keeping with the sense of anxiety, pessimism, and at times desperation that many American workers feel today.

Campa, R. (2014) the study focus on social consequences of automation and AI (Artificial Intelligence) on unemployment. The aim of this study is to identify the possible future generated by the adoption of artificial intelligence. It is mentioned in this study that relation between technology, automation and unemployment is still controversial. The study explore data in four ways 1: UNPLANNED END OF WORK SCENARIO, 2: PLANNED END OF ROBOTS SCENARIO, 3: UNPLANNED END OF ROBOTS SCENARIO AND 4: PLANNED END OF WORK SCENARIO. And it is outlined that two out of four imply the end of "Automation and Robots" and remaining two imply "End of Work".

Egbe B. E. Ogar A. M, I. M. (2008) the study shows that development countries are developed by using more and more technology at larger scale and it creates problem "Unemployment" and it leads to inequality in income distribution. This paper highlights the dualistic problem based on technology and unemployment. It is a theoretical and analytical view towards technology and unemployment.

The study shows hypothetical picture of critical analysis of effects of adoption of technology on productivity of agriculture and generation of employment. The study revealed that technological dualism is an unavoidable point of development process, it disrupt growth rates of agricultural and the employment outlooks in developing countries economies. For a sustained growth of developing countries economic these challenges must be checked through well-defined planning. The planning should be related to two sector based on technological dualism. One is industrial sector and other one is agricultural sector. The first one will support to maximization of industry reinvestment scare foreign exchange and employment generation. Second one will support to enhance process of transformation.

III. AFFECTING JOBS BY TECHNOLOGY, ARTIFICIAL INTELLIGENCE AND AUTOMATION

Since the industrial revolution, technological change has reshaped and required skills for workplace continuously over the past two centuries. And the speed of changing technology and automation could disrupt the jobs largely without precedent.

Artificial technology (AI) has the potential to be automated many jobs that workers carry out today. AI is an opportunity and challenge in profit margin and jobs. AI powered machines and robots are using by retailers in their warehouses for retailing jobs. In other organization utilities job like forecasting of demand of energy like electricity, automation in manufacturing process of products, use of AI robots in organization work, AI for autonomous car in automobile industry, AI for better understanding consumers need in financial service industry and to discover new product and services. This utilization of AI in home, offices, industry, organizations are affecting the number of jobs of human being.

In addition it is found that if whole jobs are not automated, partial automation of jobs will affect all jobs to a greater degree. Importantly this impact will be felt by labour workers, clerk, gardeners, lab technician, fashion designers, sales executives and high class employees too.

According to the World Bank, 77% automation threatens of the jobs in china while 69% in India.
According to report by ILO (International Labour Organisation) 2017, In India it is estimated that 18.9 million jobless will increase in 2019 as compare to 18.6 million jobless in 2018. Unemployment rate at 3.5% in 2016 & 2017 will be same in 2018 & 2019.

July 2016, India's IT services and BPO industry, technological unemployment was given by the HfS Future Workforce Impact Model, workforce in this sector was 0.48 million which is about 14% of the sector total workforce around 3.5 million incorporating 80% low skilled workers. Total labour force currently in India is about 476 million incorporating 25 million unemployment. 0.7% of the total workforce is employment rate in IT and BPO sector in India and it is forecast that job losses are about 2% of current size of total unemployment in India.

Global economy, MGI research (2018) on the automation potential, examining 46 countries shows that 80% of global workforce more than 2000 jobs are feasible for

automation. Less than 5% demonstrated technology is small to proportionate to jobs that can be fully automate. Currently 60% of all occupations have at least 30% of jobs that are automatable technically. It indicates that technology will change most occupations and jobs, more people will have to upgrade their skills to work with technology. Highly skilled people will be benefited as compare to low skilled workers. Low skilled workers have to put more efforts to achieve goals and may be they have to face wage pressure and competency.

On a global scale, it is assumed that the 50% of world economy (1.2 billion employees and $14.6 trillion in wages) could be affected by adoption of currently automation technologies and AI. India, United States, Japan and China only four countries accounts for over half of total. Automation potential is different in terms of sizes between these countries because of their structure of economies, dynamics of the jobs and relative level of size and wages.

IV. UNEMPLOYMENT IN INDIA

State-wise unemployment rate (UR) according to UPSS approach based on second; third; fourth and fifth annual Employment-Unemployment Survey(EUS) from 2011-12 to 2015-16 (Source:Ministry of Labour & Employment)

S.No.	Name of the State/UT	Second EUS(2011-12)	Third EUS(2012-13)	Fourth EUS(2013-14)	Fifth EUS(2015-16)
1	Andhra Pradesh	2.4	2.3	2.9	3.5
2	Arunachal Pradesh	6.4	10.2	6.7	3.9
3	Assam	4.4	4.3	2.9	4
4	Bihar	7.8	5.8	5.6	4.4
5	Chhattisgarh	1	1.3	2.1	1.2
6	Delhi	4.5	5.3	4.4	3.1
7	Goa	15.9	9.9	9.6	9
8	Gujarat	0.9	2.3	0.8	0.6
9	Haryana	2.7	4.3	2.9	3.3
10	Himachal Pradesh	1.3	2.8	1.8	10.2
11	Jammu & Kashmir	4.2	8.2	8.2	6.6
12	Jharkhand	3.6	5.9	1.8	2.2
13	Karnataka	2.4	1.8	1.7	1.4
14	Kerala	9.2	9.6	9.3	10.6
15	Madhya Pradesh	2.1	1.8	2.3	3
16	Maharashtra	2.6	3.2	2.2	1.5
17	Manipur	2.5	2.2	3.4	3.4
18	Meghalaya	1.5	3.5	2.6	4
19	Mizoram	0.3	2.2	2	1.5
20	Nagaland	4.3	6.2	6.7	5.6
21	Odisha	2.4	5.1	4.3	3.8
22	Punjab	1.6	4.7	5.4	5.8
23	Rajasthan	1.4	2.3	3.1	2.5
24	Sikkim	9	12.2	7.1	8.9
25	Tamil Nadu	2.1	3.6	3.3	3.8
26	Telangana	…..	…..	3.1	2.7
27	Tripura	12.4	8.4	6.2	10
28	Uttarakhand	4.7	4.5	5.5	6.1
29	Uttar Pradesh	2.2	4.9	4	5.8
30	West Bengal	6.1	5.9	4.2	3.6
31	Andaman & Nicobar	10.5	9.8	13	12
32	Chandigarh	2.8	5.6	2.8	3.4
33	Dadra & Nagar Haveli	2.7	1.2	4.6	2.7
34	Daman & Diu	0.6	1.2	6.6	0.3
35	Lakshadweep	20.4	10.2	10.5	4.3
36	Puducherry	4.4	10.1	8.8	4.8
All India	All India	3.3	4	3.4	3.7

Table 1:

S.NO.	States (India)	May-19
1	Andhra Pradesh	4.3
2	Assam	4.8
3	Bihar	13.6
4	Chandigarh	18.4
5	Chhattisgarh	9.8
6	Delhi	12.3
7	Goa	1.3
8	Gujarat	3.4
9	Haryana	18.3
10	Himachal Pradesh	13.4
11	Jammu & Kashmir	16.7
12	Jharkhand	9.4
13	Karnataka	6.7
14	Kerala	5
15	Madhya Pradesh	3.6
16	Maharashtra	4.7
17	Meghalaya	4.1
18	Odisha	3.5
19	Puducherry	0.8
20	Punjab	10.7
21	Rajasthan	6.3
22	Tamil Nadu	0.4
23	Telangana	2
24	Tripura	30.2
25	Uttar Pradesh	11.3
26	Uttarakhand	4.2
27	West Bengal	6.1
	Source: CMIE	

Table 2: Unemployment Rate in India

Jun-19	
India	7.90%
Urban	8.50%
Rural	7.50%
*30 day moving average	
Source: CMIE	

Table 3: Unemployment Rate

The adoption of technology is increased in India from last 10 years. And the rate of unemployment also

increased. Table no: 1 shows unemployment data state wise from 2011 to 2016 which is increasing yearly. Table no: 2 and Table: 3 unemployment data from another source which is also showing increasing rate of unemployment in India. The adoption of technology could be the one reason of this. Because technology is changing very fast and required skills to work with this changing technology is less available.

V. CONCLUSION

The impact of technological change on unemployment is a controversial matter. The supports of technological changes say that, new inventions and technology creating new jobs and opportunities and other side peoples say that there is an impact of technology, artificial intelligence and automation on unemployment especially on labour market. Wages inequality is increasing, inability to adapt technology, rapidly development of new technology these advancement in technology will impact many workers to shift their skills to technological skills and this can cause tension and resistance for them.

It is found that initially the beginning of the industrial revolution there is a negative impact of technological change on unemployment. The jobs of unskilled workers & labor are destroying by use of the machine, technology and automation. The use of technology increases the efficiency and performance of productivity. It also eliminates human errors and risk factor related to work. Artificial intelligence and robotics are set for technological up gradations in industries that are destroying jobs of unskilled workers and labors but at the same time it in increasing demand of expert and skilled workers.

The impact of technology, artificial intelligence and automation on our life is increasing rapidly. The innovation of new technology can replace various jobs of the unskilled workers that are not aware about the latest technological changes. There is huge impact of technological change on labour market and their wages. New technology has a huge impact on local jobs and opportunities. People, employee and workers need to be more and more flexible working with technology at workplace and ready to upgrade their skills in this modern technological changing environment.

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