

The Impact Of Technology On Job Markets

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I. Introduction

The focus on technology and job markets is a rapidly growing and constantly changing branch of knowledge that reveals the impact of technological progress on employment and job structure as well as the economy. Technology in the general sense can be defined as the use of science in the accomplishment of tasks which involve the use of hardware, software, automation and even new fields such as artificial intelligence and machine learning (Brynjolfsson and McAfee, 2014). These technological advancements have revolutionized the job markets across the globe and has brought along with it chances as well as risks.

Technological effects on employment can be discussed since the Industrial Revolution that was a great transition from the pre-industrial era towards the use of machinery and technology (Mokyr, 1990). This is so because with the introduction of digital technologies and internet technologies, there has been tremendous changes in job markets. These changes have been identified to include the emergence of new job categories, the enhanced automation of previous positions and the transformation of skills that define the workforce (Arntz, Gregory, & Zierahn, 2016).

However, in order to analyze the effects of technology on job markets in the present world it is crucial to look at its advantages and disadvantages. On the other hand, there are positive effects of technological advancement that include development of new job positions, increased productivity, enhancement of global linkages which enable working from distant locations and collaboration across borders (Chui, Manyika, & Miremadi, 2016). Nevertheless, technology has also been responsible for unemployment, skills misfit, and income inequality (Bessen 2019).

It is therefore important to look at the different dimensions and also the various case studies and the reactions from governments and policy makers in order to have an overall view of the effects that technology has on job markets.

II. Historical Context

In order to appreciate the role of technology in job markets it is important to identify and describe significant technologies that have been developed over time and how these technologies have influenced employment trends.

Pre-Technology Era

Technology had not yet played a significant role in the labor markets and hence labor was mainly associated with manual work and the traditional sectors. The majority of the population were engaged in agricultural activities, handicraft and low skill service sectors using simple implements and procedures (Pomeranz, 2000). WORK: Economic activity was confined mainly within the immediate vicinity of the area where the individual worked and his/her responsibilities involved working within the family set up.

Early Technological Advances

The Industrial Revolution that started in the late 1700s can be associated with a shift in the world's history. Technological advancements like the steam engine and mechanised textile production altered the structure of the labor markets by enhancing the production potential and effectiveness (Mokyr, 1990).

This period witnessed the coming in to practice of factory systems and a transition from agriculture based economies. The process of mechanization of work reduced the demand for manual work hence new employment opportunities were developed for factory operatives and machine mechanics among others through the replacement of craft and agricultural work (Crafts, 2004).

Recent Technological Changes

This has also been reaffirmed in the recent decades with the emergence of the digital revolution that has also affected job markets. The growth of computer and the internet and the use of mobile phones has made it possible for the Information technology and digital services industries to grow. The enhancement of technology with the creation of digital platforms, e-commerce, and work from home possibilities as postulated

by Brynjolfsson and McAfee (2014). Other technologies like the Artificial Intelligence and Machine learning are also adding on to the changes in the labour market by automating other numerous activities and even creation of new jobs (Chui, Manyika, & Miremadi, 2016). The change in the economy from manufacturing to knowledge-based economy has underlined the value of IT skills, creativity and flexibility in the job market (Bessen, 2019).

This background shows that job markets are a dynamic concept that continues to change due to the available technology. The shift from traditional work that involve manual labor to technological and computerized systems show the positive and negative effects that technology has brought to the employment sector.

III. The Effects Of Technology On Employment Opportunities.

Creation of New Jobs

This has resulted in the development of new professions and occupation spheres. The advancement in the technology sector coupled with the availability of digital services has led to creation of new positions among them software developers, data scientists and cybersecurity analysts (Bessen, 2019). Furthermore, the 'gig economy' has also emerged over the years due to technological advancement and this has created flexible jobs such as Uber drivers, freelance writers, and online tutors among others (Katz & Krueger, 2019). These new job opportunities have helped the economy and have provided different job career options to the workers.

Increased Efficiency

With the help of technology there has been great improvement in the work done in this century across various sectors. Technological advancements including robotization and Artificial Intelligence have helped in the reduction of routine and mundane tasks and thereby freeing up the workers for more complicated tasks (Chui, Manyika, & Miremadi, 2016). For instance, the manufacturing industries have realized enhanced production and reduced costs of production through the use of sophisticated automation technology. Likewise, technology has enhanced the supply chain management and has enhanced services in different sectors like health and finance services (Brynjolfsson & McAfee, 2014).

Global Opportunities

Advancements in technology especially in the field of communication has led to creation of job opportunities that are not bounded by geographical locations. Readily availability of video conferencing, collaboration tools and cloud computing has made remote work popular especially in the recent past (De Graff, 2022). This shift enables companies to access talents from across the globe, while employees are also able to work for companies based in different regions of the world thus creating new opportunities for work (Bloom et al. , 2015). However, due to the availability of e-commerce platforms, business have been able to reach international markets hence creating more employment and economic growth (Kraemer-Mbula & Wamae, 2017).

Skill Development

Technology has also advanced at a very fast rate and this has also created a need for new skills in the market. Employees are also expected to be knowledgeable in computer literacy, coding, and data analysis among other skills (Arntz, Gregory, & Zierahn, 2016). It is, therefore, useful to note that online learning platforms and educational technology have become valuable resources for upskilling and continuous learning to learners, which in turn help the workers to acquire training and certifications that can help them gain better employment opportunities and career growth (Brynjolfsson & McAfee, 2014).

Therefore, technology has played a great role in improving job markets through job creation, enhanced efficiency, increased worldwide employment, and enhancing skills. These benefits show that advancement in technology cannot be sobre looked in the creation of new employment systems.

Negative Impacts of Technology on Job Markets

Job Displacement

One of the most significant concerns regarding technological advancements is job displacement.

Automation and robotics have increasingly taken over tasks that were traditionally performed by humans, leading to the reduction of certain job categories (Arntz, Gregory, & Zierahn, 2016). Forexample, roles in manufacturing and routine administrative tasks have been particularly vulnerable to automation (Bessen, 2019). This shift can result in substantial job losses for workers who lack the skills to transition into new roles or industries.

Skills Gap

Technological advancement has also contributed to the increase of skills disparity in the labour market. Others are faced with challenges of high job volatility that results from obtaining skills that are no longer relevant in the market (Chui, Manyika, & Miremadi, 2016). This is because the current workforce may not have the necessary skills that are needed to support the modern technologies like the AI and machine learning. This means that if the available skills in the market do not match the skills demanded in the various jobs this may lead to higher levels of unemployment and economic inequality (Arntz, Gregory, & Zierahn, 2016).

Economic Disparities

This is because technology has the potential of leading to imbalance between the high skilled and the low skilled workers. The emergence of high paying high-tech positions results in wage drift which means that skilled workers earn much more than their counterparts in low skilled or routine positions (Bessen, 2019). Also, technology can affect some areas or countries more than others, which is not the case with natural disasters.

Job Insecurity

The nature of technology-driven job markets also causes job insecurity. Gig and freelance work that is made possible by the digital platform is associated with job instability and limited benefits as compared to conventional employment (DeGraff, 2022). These workers are likely to be in the so called 'precarious work' where there is income volatility, lack of job security and almost no social protection (Bloom et al. , 2015). This instability can therefore lead to low job satisfaction and poor financial situation.

Therefore despite the advancements that have been made by the use of technology in the society, it has also created problems including loss of jobs, skills imbalances, and poor distribution of income as well as uncertainty of employment. Mitigating these effects is important in order to guarantee that technological developments have a positive effect on employment opportunities and the economy.

IV. Case Studies

Industry-Specific Impacts

Manufacturing Manufacturing industry has been among the industries which have been most impacted by automation and robotics. New technologies and automation techniques like robotic arms and AI based quality control systems have helped in enhancing the efficiency and productivity (Brynjolfsson & McAfee, 2014). However, this change has also brought about joblessness to many people mainly those involve in traditional manufacturing jobs. For instance, a research done by Bessen (2019) established that the increase of industrial robots in the US manufacturing sector frees up employment for the manual work while also generating employment in the maintenance and programming of the robots.

Retailing Retail industry has been one of the most impacted industries by the technological advancement especially the e-commerce and digital payment methods. Some of the most popular platforms such as Amazon have shifted the focus of retail towards the consumers and effectively use data analysis for the purposes of marketing (Chui, Manyika, & Miremadi, 2016). This has opened up career opportunities in logistics, data and digital marketing, on the other hand, it has meant that many physical shops have closed down and there are fewer employment opportunities in the retail industry (Katz & Krueger, 2019). The automation of warehouses and the checkout systems is another testimony to the change that technology has brought in the employment in this industry.

Customer service has become one of the most popular sectors of the service industry which is based on the application of AI chatbots and virtual assistants. These technologies aim at dealing with simple customer inquiries and support functions with the aim of increasing productivity and decreasing costs (DeGraff, 2022). However, adoption of these technologies has been cited to have reduced the need for the conventional customer service jobs and also change the skills that are needed for the new positions that are related to the management of the AI systems and the optimization of the same (Bloom et al., 2015).

Geographic Variations

The role of technology on employment and growth of the markets is not the same in the developed and developing countries. It is very much evident that the developed countries are the biggest beneficiaries of technological advancements as it leads to generation of high skill jobs and increased productivity but at the same time it also leads to job displacement and skill mismatch (Arntz, Gregory, & Zierahn, 2016). On the other hand, the developing countries may take longer to advance technologically due to challenges in implementing new technologies which hinders job creation and widen the gap between the haves and the have-nots (Kraemer-Mbula & Wamae, 2017).

Technological effects also have variations between the urban and the rural region. Technological advancement and availability of technology remains a critical factor that defines the creation of high paying and

technology driven employment opportunities with urban areas having comparative advantage due to their better access to technology and education (Brynjolfsson & McAfee, 2014). On the flip side, the rural areas may be behind in technology and experience higher difficulties when moving from one job market to another thereby incurring higher job displacement and economic decline (Chui, Manyika, & Miremadi, 2016).

The following case analyses show the manifold and contradictory impacts of technology on job markets in various sectors and areas. Appreciating these effects is important in order to grasp the general effects of advancement in technology on employment and economic growth.

V. Government And Policy Responses

Regulation and Legislation

As a result, governments have put in place certain regulations and laws to deal with effects of technology on job markets. New patterns of work have also been put into place and legislation and standards have been set up to protect employee rights and their work situation (DeGraff, 2022). For instance, some countries of the world have enacted laws that mandate gig employers to pay workers reasonable wages and provide them with other forms of compensation as well (Katz & Krueger, 2019). Also, there has been a call for the reforms of the labor laws to incorporate the new work model and the new generation jobs that include remote working and technology-based jobs, for instance, the provision of protective measures for home-based workers (Brynjolfsson & McAfee, 2014).

Support Programs

Governments have come up with different measures to assist workers to cope with the effects of technological change, which include training and up skilling of the workers. Programs related to job retraining are centered on helping workers who have been displaced from their jobs to acquire new skills suitable for new positions in the changing market systems (Arntz, Gregory, & Zierahn, 2016). Such programs are linked to vocational training, certification, and with accredited learning institutions to offer employment-relevant skills in new fields such as IT and renewable energy (Bessen, 2019). Other policies have also been introduced to boost the income of workers that have been laid off by their employers, including unemployment benefits and social safety nets (Chui, Manyika, & Miremadi, 2016).

Education System Adjustments

To meet the increasing requirements in the modern world where most jobs are technology based, there has been some amendments made in the education system. Currently, many schools and colleges are offering digital literacy, coding, and data analysis as part of the courses they teach the students with the view of preparing them for the tomorrow's job market (Brynjolfsson & McAfee, 2014). Also, there is a rising focus on STEM (Science, Technology, Engineering, and Mathematics) education to develop the competencies necessary for the new economy's high skilled positions (Katz & Krueger, 2019). Governments and educational institutions are also supporting lifelong learning and continuous professional development schemes which enable the workforce to be capable to adapt with the changing technological environment (Bessen, 2019).

Thus, governments and policy makers are aware of the consequences of technological advancements and its effects on employment and job markets, and are working towards mitigating the same through policy changes, supportive measures and educational reforms. These are measures that are being taken to ensure that the impacts of technological change are not detrimental to the employees and the overall society while at the same time trying to take advantage of the positive impacts of technology.

VI. Conclusion

Technology has been known to affect job markets in various ways giving both positive and negative effects on the job market and the economy. The use of automation, artificial intelligence and digital systems has brought change in job markets through development of new jobs, enhancing productivity and integration of world markets (Brynjolfsson & McAfee, 2014; Chui, Manyika, & Miremadi, 2016). These changes have created new employment opportunities, increased efficiency and opened the world market for employment opportunities.

But there is a drawback of this development in technology and that is the rate of change. There are several issues that arise and require solution which include; job loss due to automation and emergence of new jobs center on skills gaps, unequal distribution of income and increasing job insecurity (Arntz, Gregory, & Zierahn, 2016; Bessen, 2019). These challenges need an articulate policy response to address them and thus to make sure that the fruits of technology are shared equally.

To this end, governments and policy makers have the responsibility of putting into place certain measures and programs that help in dealing with changes in the workforce. Some of the measures that are useful in the current climate include job training, educational measures, and revised labor laws as the workforce gets ready for new positions (DeGraff, 2022; Katz & Krueger, 2019).

Therefore, it is important that as technology progresses so does the research and changes that need to be made in order to effectively manage the effects that it has on job markets. Societies can thus optimize on the opportunities that come with technology while at the same time minimizing on the negative impact of technology by ensuring that there is a balance between technology and people.

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