

PalArch's Journal of Archaeology of Egypt / Egyptology

CURRENT AND FUTURE IMPACT OF ARTIFICIAL INTELLIGENCE: AN EMPLOYMENT PERSPECTIVE BASED ON CASE STUDIES

*Kiran Jameel¹, Humaira Ali², Marium Sara Minhas Bandedali³, Usman Ghani Chishti⁴, Syed
Shahid Zaheer Zaidi⁵*

¹Assistant Professor, Hamdard Institute of Management Science, Hamdard University Karachi

²Research Scholar, Department of Business Administration, Institute of Business Management,
Pakistan

³Research Scholar, Department of Public Administration, University of Karachi, Pakistan

⁴Research Scholar, Department of Public Administration, University of Karachi, Pakistan

⁵Assistant Professor, Department of Public Administration, University of Karachi, Pakistan

¹kiranjuw88@gmail.com, ²std_23820@iobm.edu.pk, ³marium_minhas@hotmail.com,
⁴ugc2@hotmail.com, ⁵sszzaidi@huok.edu.pk

**Kiran Jameel, Humaira Ali, Marium Sara Minhas Bandedali, Usman Ghani
Chishti, Syed Shahid Zaheer Zaidi Current And Future Impact Of Artificial
Intelligence: An Employment Perspective Based On Case Studies– PalArch's
Journal of Archaeology of Egypt/Egyptology 17(9) (2020), ISSN 1567-214X.**

Keywords: Artificial Intelligence, Unemployment, new technologies

ABSTRACT

The study upon the topic, “Impact of Artificial Intelligence Application Based on Firms & Consultancy: A Case Study on Employment Perspective” strives to investigate the impact of Artificial Intelligence on manly Employment. The study has gathered the results through various case studies. The collection of case studies is accompanied by a review of previous studies, journal articles, reports, and surveys by market research consultancies, firms, and others. Qualitative analysis is done, which matches the interpretive research model and permits the illustration of general insights to tackle the research questions. The framework of the study is more comprehensive than deep, to counter the limitations and biases in choosing the cases. The study finds that in the upcoming times, AI will result in unemployment as other types of new technology did in the previous times, and hazardous social unrest will be triggered, possibly at an even rapid pace. If unemployment continues, the income gap between the poorest and the richest will get even broader. However, this study also suggests various recommendations to avoid the worst effects of AI on employment.

1. INTRODUCTION

1.1 Background of the Study

New technologies are creating both the losers and winners in the labour market. Such technologies are altering relative demands for professions, even as they enhance living standards and productivity. In contemporary times, one technology is causing specific anxiety regarding job displacement: artificial intelligence. Machine learning or artificial intelligence attributes towards the algorithms that acquire to accomplish tasks by recognizing statistical data patterns, instead of following provided instructions by humans. This technology has currently attained superhuman performance across an extensive array of economically valued tasks (Dirican, 2015).

Artificial intelligence technologies are evolving rapidly, with many possible benefits for individuals, economies, communities, and societies. Realizing their value requires achieving such benefits as broadly as possible, as quickly as possible and with the smoothest possible transition. AI has the potential to provide expansive productivity and long term industrial links moving forward (West, 2015). Many major industries of the world, including retail, manufacturing and entertainment, are already using AI advancements to enhance their reach and effectiveness. In the recent times, AI technology leads to global mechanization in distinct fields and intelligent machines can carry out more and more non-standard jobs like enhancing the efficacy of e-commerce projects or handling lines of production in heavy industries (Hagendorff, 2020). This tendency leads to the emergence of practical concerns regarding the complete substitution of human beings by intelligent systems of machines in job roles.

Thus it is now high time to discuss the overall effects that AI might have upon the work and personal lives of modern-day humans. The simple fact that AI has the potential to replace entire systems of healthcare and production completely makes it hard for projectionists to make key observations across the multitude of fields that will be affected (Kumar, Singh, Jyoti, & Bhatnagar, 2019). Technology has already shaped the overall landscape of major research domains, from economics to robotics to anthropology; the overall impact of these forces on the institutions and administrations of the world will help shape society in the future (Makridakis, 2017). The main public debate regarding the matter of AI revolves around extremes such as technology replacing entire job markets and leaving an overall void in the economic framework of the country. However, these notions are completely unjustified, and no properly designated metric has confirmed such a state in the future (Acemoglu & Restrepo, 2018).

1.2 Objective of the Study

The study will seek to explore the following research objectives:

- To evaluate the increasing relevancy of AI in the employment sector in the current times.
- To assess the evolution of future job markets to include AI.
- To examine the impact on employees' wellbeing and earnings in an instance of a significant number of employees being displaced.
- To evaluate the different possible AI related jobs that can be created in the future.
- To review the future skills' requirement related to AI.

- To appraise the technology expansion in AI-enabled countries heading to AI-divide – The ‘dark side’ to AI.
- To review the ethical considerations to take into view while looking at the future of AI.

1.3 Scope of the Study

The scope of this research study is restricted to examining the effects of AI on the current employment scenario and the future AI implications on jobs and employment.

1.4 Statement of Purpose

The research will explore the phenomenon that if due to AI; displacement and losses of jobs are happening in the short term and while over the longer term; if wealth, productivity, and employment all tend to increase.

1.5 Research Questions

Below are some key questions that will be looked at moving forward.

- What is making AI more relevant in the employment sector in the current times?
- How can the future job market evolve to include AI?
- What will be the impact on employees’ wellbeing and earnings if a significant number of employees are displaced?
- What are the different possible jobs AI related jobs that can be created in the future?
- What are the future skills’ requirement connected to AI?
- How can the technology expansion in AI-enabled countries lead to AI-divide – The ‘dark side’ to AI?
- What are the ethical considerations to take into view while looking at the future of AI?

2. LITERATURE REVIEW

2.1 Artificial Intelligence-Interpretation and Functions

AI is regarded as a machine which is capable of imitating human cognitive jobs, and is utilized in distinct fields; like transport, healthcare, art, finance etc. The below figure demonstrates the extensive range of AI functions:

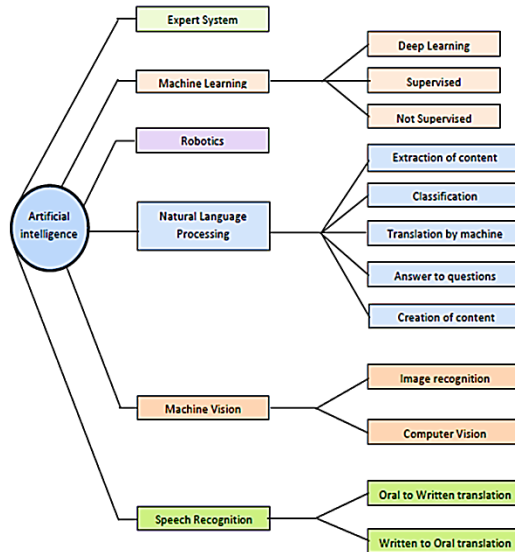


Figure 1: AI Functions (Acemoglu & Restrepo, 2018)

It takes the data in the form of text, images, sound, and videos etc., assesses this data utilizing AI algorithm and delivers AI-powered solutions (Holtel, 2016). The below figure depicts the sense-think-and-act cycle for an IA:



Figure 2: Sense-Think-and-Act procedure (Holtel, 2016)

Taking into account, the AI which can imitate the major human intelligence functions-one is yet far from it. This sort of AI is rather an argumentative issue which varies the opinions of experts into three perspectives. The initial one regards AI as a valuable technology being accommodating in decision making and executives must treat it as an associate. The other group anticipates the merge between human and AI for the sake of enhancing humanity. The last group regards vigorous AI as a danger for humanity as it can take human tasks by automation and mechanization of working jobs. This particular group claims that the developers of AI must keep in mind the social and ethical issues while building intelligent machines (Acemoglu & Restrepo, 2018).

2.2 Current Technological Change and its Effect

A rich literature reports changes in the employment structure in developed economies between the 1980s and the 2000s; characterized as 'job polarization.' Job polarization refers towards a lessening in the quantity of 'middle education' jobs (traditionally requiring secondary school or professional capabilities), also an ascent in the quantity of 'high-education' employments (requiring advanced education capabilities) and 'low-education' employments (needing minimal conventional education). At the similar time, there has also been a rise in the

inequality of earnings –particularly, a rise in the distance among high earners (the top 10) and other employees. (Barbieri, Mussida, Piva, & Vivarelli, 2019). The procedure by which AI adds to polarization has been explained utilizing a monetary 'task-based' model. This model ponders a beginning situation where workers are allocated to assignments as follows: low-educated employees to undertake majorly regular cognitive works and non-routine manual jobs; middle educated employees to perform majorly routine cognitive jobs; high educated employees to undertake majorly non-routine cognitive jobs (CEPS, 2019). In corresponding with work polarization, it was additionally seen that highly educated employees in the United States and other evolved economies have progressively clustered geographically. Highly educated and other employees have grown apart not merely in earning terms but also location wise (Chuah, Loayza, & Schmillen, 2018).

2.3 Current Evidence on the Impact of AI on the Wages and Employment

Past examinations have prescribed that automation may not cause employment decline in the fields generally influenced. Research on the impact of automation on business, nonetheless, is less clear. Moreover, there is proof of a negative impact of mechanization, explicitly on the occupations and income of employees most directly replaced by the mechanical robots: low-educated and (to a lesser degree) middle educated employees in assembling sectors (Decker et al., 2017). Employments and loss of income for laborers straightforwardly influenced via automation could be more probable in an occurrence of modern robots, comparative with different sorts of automation. As indicated by the prior studies that every robot decimates around two manufacturing employments. This infers a total loss of around 275,000 manufacturing jobs between the years 1994 till 2014, which represents approximately 23 percent of the decay over those two decades (Holtel, 2016). This job loss was more than counterbalanced by development in service division jobs.

2.4 The job of AI in Shaping Future Employment

A broad collection of current hypothetical work in economics expands on the writing on job polarization to take into account the potential impact on employment of the AI adoption. Past inquires conventionally set out an economic model where final merchandise are generated utilizing capital and labors as inputs, and labour comprises of several separate tasks. AI that licenses computerizing various job tasks is expected to become accessible (Korinek et al., 2017). The model evaluates how this changes firms' interest in capital and labour.

This is in a joint effort with models utilized to survey the immediate effect of AI (particularly, work polarization). This is by and by another methodology rather than a traditional monetary appraisal of innovation where innovation is seen as enlarging, not supplanting, work, and thus as typically prompting expanded income for employees both in the long and present term. Past research has grasped distinct modelling selections to stress, individually, on the effect of innovation on work in a specific segment, and on the impact of innovation on labour in the long run (Makridakis, 2017). A former study initially inspects the impacts of technological change on employees viewed as a single group. AI replaces labour in the short run in performing particular job tasks that are automated. This can lead to losses of jobs

(displacement), lessen the income share that flows to employees (in contrast to capital owners) and declining earnings (Reilly, 2018).

Substitution impact may dominate in the short term, and employees' situation may further deteriorate. In the long term, the productivity impact is always vigorous enough to counterbalance the substitution impact at least. Real wages ascend as opposed to the pre-automation situation. Still, as a rising proportion of economic activity is automated, that is, produced with capital and minimal labour, the income share attained by the employees' comparative to capital owners might fall (Masayuki, 2016). In this evaluation, the short term impact of AI relies upon the balance between substitution impact, productivity impact, and generation of new jobs.

The digitization age has already shown us how they can introduce a whole new avenue of connectivity and earnings, which was previously unknown. Social media platforms such as Facebook and Twitter have allowed the seamless transfer of knowledge and capabilities, providing the world with 'platform markets' (Chen et al., 2013). The introduction of Airbnb and Uber has also allowed platform-based business models to emerge that have provided sustainable ways to increase population welfare. AI can also thus be categorized into the same functionality and be seen as a way to introduce a new era of worker regulation in the world. Moreover, the introduction of data analysis and efficient data reconstruction algorithms, it is now possible to perform better prediction analysis regarding specific business and industrial metrics that are prevalent in the world. The overall access to these data center hubs is a challenge for any emerging AI technologies, and the proper utilization of these statistics can provide key policy points that are necessary for making a more widely accessible marketplace (Chuah et al., 2018). The fact that AI can replace menial worker jobs that are currently prevalent in the world can create an unfathomable void in the consumer market. The sudden decrease in the demand for the tasks that are automated will inflate the overall irrelevance of the unskilled labour. However, technologists argue that with the induction of AI, the overall productivity of the industry will increase without the creation of any new jobs. This can be catastrophic as the sudden divide between the skilled and the unskilled will be more apparent. A jobless future can be created in this scenario in which humans will not suffer from being underpaid, but being totally irrelevant in the grand scheme of things (Chuah et al., 2018).

2.5 Potential Job Displacements Connected to Artificial Intelligence

Occupations that do not incorporate comparatively complicated interaction with other individuals, especially, persuading or influencing others, caring for and helping others, managing other individuals' work and training others are also most open to automation-related AI (Webb, 2019). According to research, other professions that can be said most exposed to automation-related AI are jobs that incorporate manual skills- for instance, carrying out open-heart surgery with the help of surgical instruments and manual capability. This is varying with the expectation that manual jobs incorporating capability would be comparatively tough to automate (West, 2015).

Typically, jobs held by younger employees are also at greater risk of automation. It is demonstrated that employees aged under twenty are over- represented in

different professions at high automation risk (for instance, sales, cleaners). But employees aged under twenty are also at greater automation risk in comparison to older employees who carry out the similar profession (Acemoglu & Restrepo, 2018). The number of jobs projected to be at high automation-related AI risk differs substantially across the researches. The below figure reports projections for the US. The number of jobs projected to be at greater automation-related AI risk differs between nine percent and forty-seven percent. Across all researches incorporated in the figure, 'high risk' has been explained as a projected probability of automation of seventy percent or greater. McKinsey sets the year 2030 as the time zone for projected automation, while PWC estimates into the mid-2030s, and NQ, AGZ, and FO do not provide a projected timing (Barbieri et al., 2019).

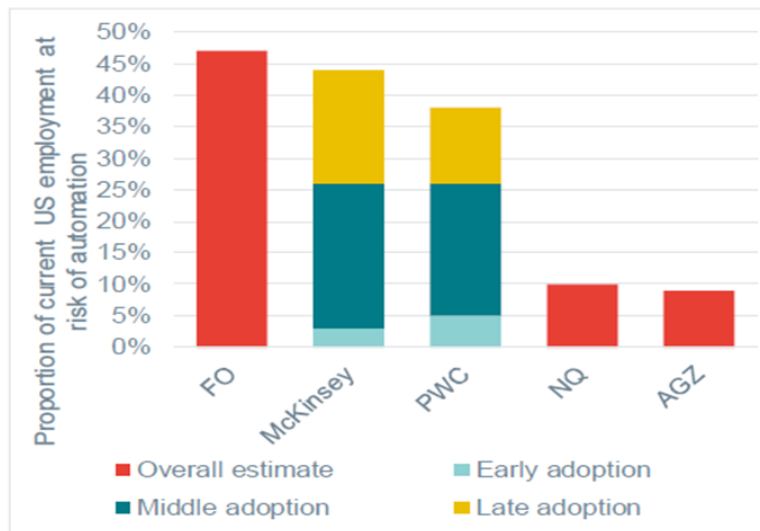


Figure 3: Predicted Employment Proportion at the Probability of High Automation (Barbieri et al., 2019)

PWC and McKinsey intend to impart further detail on the probable timing of potential AI-related automation. The three components of the bars in the above figure must be interpreted as distinct adoption instances in the McKinsey case, and distinct phases of adoption in the PWC case. For McKinsey, the chosen projection is provided by the midpoint adoption scenario (twenty-six percent employment automated by the year 2030). The late adoption and initial adoption figures (merely under five percent and forty-four percent respectively) are substitute estimates under distinct assumptions regarding the adoption and development of AI—additional details on these assumptions are given below:

- PWC's entire projection of automation potential by the mid of the year 2030 is provided by the overall bar height (38 percent). Here, late, middle and early adoption depict potential automation by the early 2020s, the late 2020s, and the middle of 2030s accordingly.

2.6 Predictions of Possible Job Creation Connected to AI and Future Requirements of Skills

The first-order impacts of AI on employment may not merely incorporate replacing employees in existing jobs, but also producing new jobs for employees to carry out. It is claimed in prior studies that new jobs have emerged in former eras of technological change and that they explain approximately half of the fresh

employment generation in the US between the years 1980 and 2000 (Atkinson, 2018). Numerous contributions have indicated that embracing AI will lead to novel problems that have not been previously resolved, few of which might head to the appearance of new professional classifications. On the face of it, numerous, but not all of the new possible professions seem to be appear most appropriate to highly educated employees.

A former study has recommended that trainers (employees carrying out jobs useful to AI systems of trains), explainers (employees interpreting the results generated by the systems of AI so firms employing the systems can be responsible internally as well as to others), and sustainers' (employees monitoring the Ai work systems to avert and mitigate any accidental consequences) might all be the future jobs (Smith & Anderson, 2014). A study has embraced an innovative tactic to interpret expert judgment into estimates regarding an extensive set of professions. The examination generates estimates for the possibility that the total proportion and the share of individuals employed in each profession will decrease, increase, or stay constant by the year 2030 (Bakhshi et al., 2018). The study imparts separate predictions, generated utilizing a similar tactic but judgment by a distinct group of specialists, for the UK and the US.

Professions anticipated to grow also incorporate some middle education professions, like construction trades employees in the US, fitness and sports professions, electronic and electrical trade in Britain. The interpretation of the authors of the outcomes also recommends that few of the low education professions anticipated to grow (like hospitality) could become growingly being paid better, possibly in light of the current evidence on the part being played by new craft activities in the economy like microbreweries

2.7 The 'Dark side' to AI

It is astonishing to know that out of one hundred and ninety-five countries in the world, AI17 and AI18 are set merely in 13 countries, that is; top international artificial intelligence start-ups are situated in merely 6.6 percent of the countries in the world. Among these 13 countries, there are merely 30 states which are primary in this revolution of AI. The below figures depicts the AI17 and AI18 percentage in distinct parts of the globe (Anderson, Rainie, & Luchsinger, 2018). The US is foremost in this revolution with the head offices of nearly three fourth of the total set-ups with the majority in California, Silicon Valley, the hub of AI.

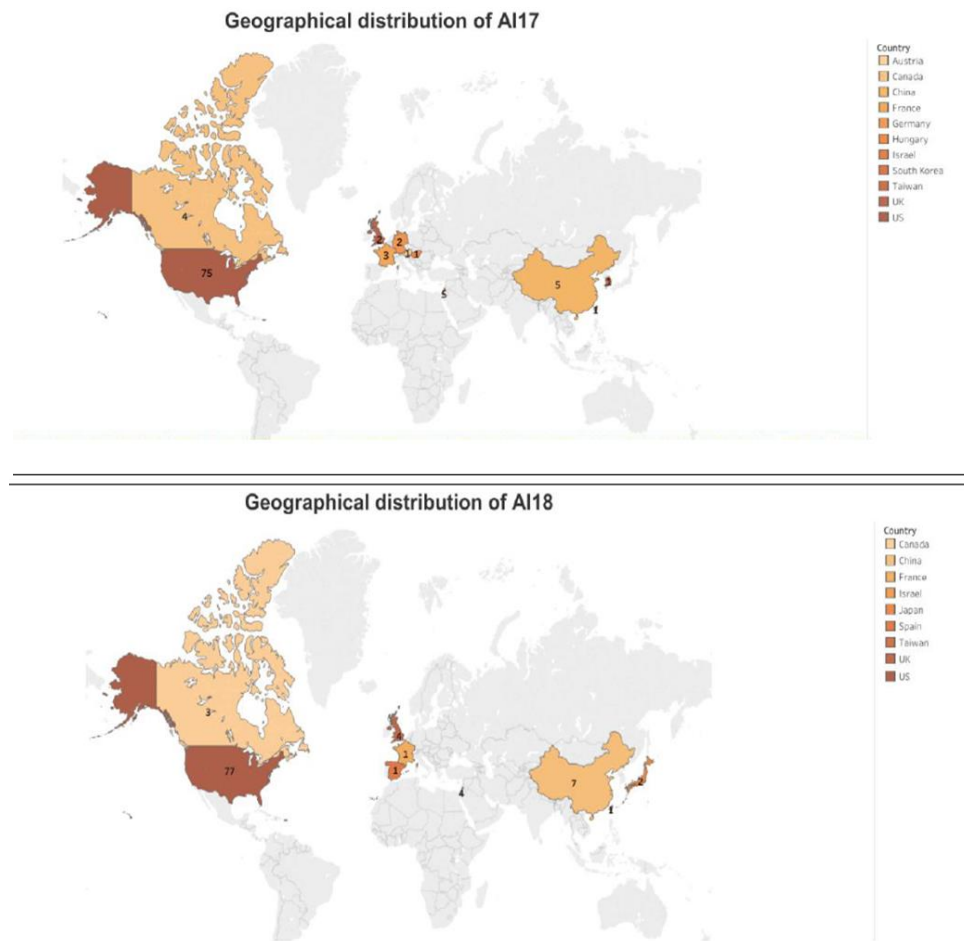


Figure 4: Geographical Distribution of AI17 and AI18 (Anderson et al., 2018)

2.8 Ethical Concerns in Artificial Intelligence

AI imparts a challenging set of ethical enquiries for both the corporations as well as the over society. AI provides a difficult set of ethical questions for society as well. One question centers on the preservation of the workforce. In the accounting profession, for example, AI can extract data from thousands of lease contracts to enable faster implementation of new lease accounting standards. This can help individuals who would have managed the extraction of data to carry out more complex accounting jobs and possibly even contribute to policy (Bostrom & Yudkowsky, 2014).

While businesses strive to resolve their individual AI associated problems, the public sector also will have a part to play. Obviously, the controllers will have a say in if self-driving cars will be allowed on the roads. That will be the uncomplicated part. It will be more perplexing to consider other problems like employee preservation and how to safeguard population segments that might be disadvantaged by algorithms' biases (Pavaloiu & Kose, 2017).

3. METHODOLOGY

This research fundamentally utilizes a case studies based, inductive approach under an explanatory model. An inductive approach, where a researcher reasons from particular examples to arrive at a wide-ranging conclusion, is appropriate to the topic as no all-embracing management or scientific theory will best fit it (Achari, 2014). Case study methods permit for a holistic and in-depth evaluation of a complicated situation in a particular real-life scenario (Daniel & Sam, 2011). The chosen case studies evolve and highlight an array of issues and how they were managed, demonstrating best practices and common pitfalls (Devi, 2017). A common misapprehension regarding case studies is that context-independent (general theoretical) knowledge is more valued than context-dependent (case knowledge).

This research employs a secondary technique of data collection that is case studies; which are extracted from the different research papers.

3.1 Data Collection

The collection of case studies is accompanied by a review of previous studies, journal articles, reports, and surveys by market research consultancies, firms, and others. Qualitative analysis is done, which matches the interpretive research model and permits the illustration of general insights to tackle the research questions.

3.2 Analysis of Data

Data analysis is carried out employing an interpretative research model which suggests that reality is a subjective idea (Novikov & Novikov, 2013).

3.3 Reliability and Validity

The approach based on case studies is also open to the criticism, like the generality and reliability of the outcomes given one is deducing from a small number of cases, and if intense revelation to study of the case tilts the results (Kumar, 2018). As a technique to tackle these criticisms, an effort is made to select cross-industry cases. Moreover, the framework of the study is also more comprehensive than deep, to counter the limitations and biases in choosing the cases (Singh, 2010).

4. FINDINGS, ANALYSIS, AND DISCUSSIONS

4.1 Contrasting Perspectives

Doomsayer's Perspective

Technology enhances to make human labour more efficient, but substantial advances may generate deleterious impacts for employment. This obsolescing by means of labour replacement leads many to fear regarding technological unemployment and stimulates efforts to predict the effects of AI on employment.

Optimist's Perspective

Optimists recommend that technology might replace for some sorts of labour but that efficiency increase from technological expansion outweigh the costs of transition, and in many instances; technology augments employment for employees who are not in direct competition with it. Even though contemporary

follow up researches recommend that all of them are short term gains (Bolton, 2018).

Unifying Perspectives

On one side, multiple dynamics complement technological change and generate uncertainty regarding the work future. On the other side, experts approve that jobs are best comprehended as abstract bundles of expertise and that technology directly affects demand for particular skills in place of acting on entire jobs all at once. Hence, an extensive framework that relates particular types of skills to career mobility and the entire urban workforces may assist in unifying opposing perspectives (Dignum, 2017).

4.2 Effects of AI on Employment

In the upcoming times, AI will result in unemployment as other types of technology did in the previous times, and hazardous social unrest will be triggered, possibly at an even rapid pace. If unemployment continues, the income gap between the poorest and the richest will get even broader. Income inequality will rise as AI capital owners will augment their wealth, while several employees might not attain benefits (Göranzon & Josefson, 2012). Dignity loss for employees might also go along with the unemployment AI will cause. Crime, riots, social unrest, homicide, race tension, and other sorts of current societal issues could be exacerbated. Nevertheless, the root cause of such issues can frequently be referred to unemployment and the absence of career opportunities (He et al., 2018).

Organizations have already initiated to evolve AI technology that will become the new engine of the continued and old procedure of job automation. Several countries have already employed fundamental automation technology to substitute labour. job automation will be fast-tracked with AI, and it will have a wider effect. That is due to the reason that conventional automation incorporates explicit programming, which needs a lot of human labour and thus enhances the costs of production.

A Case Study on Self-Driving Cars

An instance of today's utilization of AI machine learning is the self-driving car. It would be inefficient and challenging to evolve self-driving technology employing a conventional explicit method of programming (Kolbjørnsrud, Amico, & Thomas, 2016). It would need software engineers to count for all the probable scenarios that could occur during driving in the real-life. Such conditions are impossible and are unlimited to cover completely. But with the AI technology, the system of a car could make decisions that imitate a human driver and acquire from driving data shared from other self-driving vehicles (Linson, 2016). Ford, Tesla, Google, Uber, BMW, GM and the most major car manufacturers are evolving self-driving technologies.

Impact of AI on Retail Sector Employment-A Case Study on Stitch Fix; an Online Apparel Shopping Service

Many critics are of the opinion that significant losses of jobs will be inevitable in the retail industry due to automation and AI technology. Stitch Fix, a retailer dealing in online customized clothing; has machine learning in its DNA. Established in the year 2011 in San Francisco. From its inception, its business model has been centered on the union of powerful algorithms, detailed client

provided data, and personal stylists. Machine learning techniques are growingly being utilized to refine algorithms and expand- instead of replacing the work of its personal stylists and eventually its client satisfaction with the clothing they buy (Su, 2018). Presenting the perspective of chief algorithms officer of the brand Stitch Fix; he claims that an online apparel shopping service, perceives AI as a work companion of its clothing stylists instead of a replacement. Their job is hugely impacted by the assessment and recommendations of the organization's 'styling algorithms'.

4.3 Ethical Dilemmas and Ethical Responsibilities

As humans move up the automation levels, putting more accountability on the automated systems rather than the humans; several ethical problems will emerge. In the year 2014, the Open Roboethics initiative carried out a poll enquiring people about what they supposed an autonomous vehicle in which they were a passenger must do if a kid stepped out in front of the car in a tunnel. The vehicle would have no time to brake and save the life of the child, but could diverge into the tunnel walls killing the passenger (Dignum, 2018).

Ethical Responsibility

Robots will require to make judgments calls in vague and uncertain conditions, or 'no win' circumstances. Nevertheless, which ethical theory or approach must a robot be planned to follow when there is no legitimate guidance. Distinct approaches can bring about different outcomes, incorporating the number of crash mortalities. Additionally, who must choose the morals for the autonomous vehicles- passengers, consumers, politicians or the manufacturers. It has been argued that the accountability must be shared among the driver, engineers and the autonomous system of driving itself (Webster & Ivanov, 2020).

The findings are consistent with the work of Pavaloiu and Kose (2017), who have claimed that the controllers will have a say in if self-driving cars will be allowed on the roads. The technology might be here now, but the moral and ethical principles for managing artificial intelligence will take considerable time to evolve. It opens up an extensive range of enquiries that the private sector is not going to feel very happy to immediately answer altogether. It's going to need a multidisciplinary exertion and bridged to be built to make out how to go to an advantageous and win-win situation.

5. CONCLUSIONS AND RECOMMENDATIONS

This research study, ' Impact of Artificial Intelligence Application Based on Firms & Consultancy: A Case Study on Employment Perspective ' has successfully attained all of its objectives:

- The first objective of the study that is; 'to evaluate the increasing relevancy of AI in the employment sector in the current times', concludes that with the initiation of extensive automation alongside AI, employment is one other area prepared for considerable upheaval.
- The second objective of the study that is; 'to assess the evolution of future job markets to include AI', concludes that embracing AI will lead to novel problems that have not been previously resolved, few of which might head to the appearance of new professional classifications.

- The third objective of the study that is; 'to examine the impact on employees' wellbeing and earnings in an instance of a significant number of employees being displaced', concludes that there is a broad consensus in the literature that numerous of the current have substantial automation potential.
- The fourth objective of the study that is; 'to appraise the technology expansion in AI-enabled countries heading to AI-divide – The 'dark side' to AI', the AI talent is restricted merely to a few world regions generating an AI divide- the AI dark side. The additional technological expansion in AI-enabled states and non-participation of the rest of the world will broaden this divide.
- The fifth and the final objective of the study that is; 'to review the ethical considerations to take into view while looking at the future of AI', concludes that AI provides a difficult set of ethical questions for society as well as the organizations. The moral and ethical principles for managing artificial intelligence will take considerable time to evolve. It opens up an extensive range of enquiries that the private sector is not going to feel very happy to answer altogether immediately.

5.1 Recommendations

In the upcoming few years and decades, numerous employees will lose their jobs to robots, while the employees retaining their jobs will undergo enhanced psychological and physical pressure, and yet more will experience unemployment because of the absence of jobs.

Numerous solutions have been suggested by this study to tackle these problems. A vital consideration is to increase the level of employees' education raise the level of workers' education (both initially and continuing) so that employees can commence the higher degree jobs needed by automation (de Araújo, 2016). Training schemes to evolve novel, requisite sets of skills accessible across the spectrum of the labour force, and not merely for low-skilled employees, could be mandated (Müller & Bostrom, 2016).

UBI (universal basic income) is one other concept suggested to tackle technological unemployment, with all of the residents or citizens unconditionally getting enough regular amounts of money that will allow them to live. Furthermore, there would be no need for people to look for work or to work. There are several UBI versions, varying extensively in terms of the suggested amount of income and the source of funding (Müller, 2016b).

The concept of robot taxes has been suggested as one other alternative to deal with the possible unemployment generated by the AI. The fundamental idea is to tax entities and corporations deploying robots that produce job losses (Thrun & Ullsch, 2020).

In the present economic structure where a minority possesses robots, the productivity gains they allow (for instance; reduced working hours and higher wages) are not inclined to be shared by the majority of people working; instead, robots would be perceived as the reason for job losses for humans. Hence, to attain the ideal society that most robotics researchers have in mind the concept of who possesses the robots, the minority of capitalists or the working majority, might be the critical question.

5.2 Research Limitations

Artificial intelligence is a diverse, broad, and dynamic field including an array of technologies; hence a wide-ranging survey of companies and literature is not feasible. In a place, this research study intends to pull together a practitioner-focused concise, relevant, and practical guide. A distant approach could have been to emphasize by technology and industry- for instance, deep learning for recommender system in retail. Still, this study targets to serve the broader audience, in place of a study which is profound in technical details.

REFERENCES

- [1] Acemoglu, D., & Restrepo, P. (2018). Artificial Intelligence, Automation and Work (Working Paper No. 24196; Working Paper Series). National Bureau of Economic Research. <https://doi.org/10.3386/w24196>
- [2] Anderson, J., Rainie, L., & Luchsinger, A. (2018). Artificial Intelligence and the Future of Humans. 123.
- [3] Atkinson, R. D. (2018). Economic and Labor Force Implications of Artificial Intelligence. 15.
- [4] Barbieri, L., Mussida, C., Piva, M., & Vivarelli, M. (2019). Testing the Employment Impact of Automation, Robots and AI: A Survey and Some Methodological Issues. 23.
- [5] Bolton, C. (2018). The Power of Human-Machine Collaboration: Artificial Intelligence Business Automation, and the Smart Economy. *Economics, Management, and Financial Markets*, 13(4), 51–56.
- [6] Bostrom, N., & Yudkowsky, E. (2014). The ethics of artificial intelligence. In K. Frankish & W. M. Ramsey (Eds.), *The Cambridge Handbook of Artificial Intelligence* (pp. 316–334). Cambridge University Press. <https://doi.org/10.1017/CBO9781139046855.020>
- [7] CEPS, T. F. R. (2019). Artificial Intelligence: Ethics, Governance and Policy Challenges by Andrea Renda: SSRN. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3420810
- [8] Chen, N., Christensen, L., Gallagher, K., Mate, R., & Rafert, G. (2013). Global Economic Impacts Associated with Artificial Intelligence. 23.
- [9] Chuah, L. L., Loayza, N., & Schmillen, A. (2018). The Future of Work: Race With — Not Against — the Machine. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3400509>
- [10] de Araújo, A. B. (2016). Semantic Information and Artificial Intelligence. In V. C. Müller (Ed.), *Fundamental Issues of Artificial Intelligence* (pp. 129–140). Springer International Publishing. https://doi.org/10.1007/978-3-319-26485-1_9
- [11] Decker, M., Fischer, M., & Ott, I. (2017). Service Robotics and Human Labor: A first technology assessment of substitution and cooperation—ScienceDirect. 87. <https://www.sciencedirect.com/science/article/pii/S0921889016306285>
- [12] Dignum, V. (2017). Responsible Artificial Intelligence: Designing Ai for Human Values. <http://dspace.library.daffodilvarsity.edu.bd:8080/handle/20.500.11948/2177>

- [13] Dignum, V. (2018). Ethics in artificial intelligence: Introduction to the special issue. 20(1).
https://www.researchgate.net/publication/323151641_Ethics_in_artificial_intelligence_introduction_to_the_special_issue
- [14] Dirican, C. (2015). The Impacts of Robotics, Artificial Intelligence On Business and Economics. *Procedia - Social and Behavioral Sciences*, 195, 564–573.
<https://doi.org/10.1016/j.sbspro.2015.06.134>
- [15] Göranzon, B., & Josefson, I. (2012). *Knowledge, Skill and Artificial Intelligence*. Springer Science & Business Media.
- [16] Hagendorff, T. (2020). The Ethics of AI Ethics: An Evaluation of Guidelines. *Minds and Machines*. <https://doi.org/10.1007/s11023-020-09517-8>
- [17] He, D., Guo, M., Zhou, J., & Guo, V. (2018). The Impact of Artificial Intelligence (AI) on the Financial Job Market. 44.
- [18] Holtel, S. (2016). Artificial Intelligence Creates a Wicked Problem for the Enterprise—*ScienceDirect*. 99, 171–180.
- [19] Kolbjørnsrud, V., Amico, Ri., & Thomas, R. J. (2016). The promise of artificial intelligence: Redefining management in the workforce of the future. 23.
- [20] Korinek, A., Hopkins, J., & Stiglitz, J. E. (2017). Artificial Intelligence and Its Implications for Income Distribution and Unemployment. 44.
- [21] Kumar, G., Singh, G., Jyoti, K., & Bhatnagar, V. (2019). Scary Dark Side of Artificial Intelligence: A Perilous Contrivance to Mankind. *Research Gate*, 7(5).
https://www.researchgate.net/publication/337032881_SCARY_DARK_SIDE_OF_ARTIFICIAL_INTELLIGENCE_A_PERILOUS_CONTRIVANCE_TO_MANKIND
- [22] Linson, A. (2016). Machine Art or Machine Artists?: Dennett, Danto, and the Expressive Stance. In V. C. Müller (Ed.), *Fundamental Issues of Artificial Intelligence* (pp. 443–458). Springer International Publishing.
https://doi.org/10.1007/978-3-319-26485-1_26
- [23] Makridakis, P. S. (2017). The forthcoming Artificial Intelligence (AI) revolution: Its impact on society and firms—*ScienceDirect*.
<https://www.sciencedirect.com/science/article/abs/pii/S0016328717300046>
- [24] Müller, V. C. (2016b). New Developments in the Philosophy of AI. In V. C. Müller (Ed.), *Fundamental Issues of Artificial Intelligence* (pp. 1–4). Springer International Publishing. https://doi.org/10.1007/978-3-319-26485-1_1
- [25] Müller, V. C., & Bostrom, N. (2016). Future Progress in Artificial Intelligence: A Survey of Expert Opinion. In V. C. Müller (Ed.), *Fundamental Issues of Artificial Intelligence* (pp. 555–572). Springer International Publishing.
https://doi.org/10.1007/978-3-319-26485-1_33
- [26] Pavaloiu, A., & Kose, U. (2017). Ethical Artificial Intelligence—An Open Question. 13.
- [27] Reilly, P. (2018). The impact of artificial intelligence on the HR function. 18.
- [28] Russell, S. (2016). Rationality and Intelligence: A Brief Update. In V. C. Müller (Ed.), *Fundamental Issues of Artificial Intelligence* (pp. 7–28). Springer International Publishing. https://doi.org/10.1007/978-3-319-26485-1_2
- [29] Smith, A., & Anderson, J. (2014). AI, Robotics, and the Future of Jobs. 78.
- [30] Su, G. (2018). Unemployment in the AI age. *AI Matters*, 3(4), 35–43.
<https://doi.org/10.1145/3175502.3175511>

- [31] Thrun, M. C., & Ultsch, A. (2020). Swarm Intelligence for Self-Organized Clustering. *Artificial Intelligence*, 103237. <https://doi.org/10.1016/j.artint.2020.103237>
- [32] Webb, M. (2019). The Impact of Artificial Intelligence on the Labor Market. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3482150>
- [33] Webster, C., & Ivanov, S. (2020). Robotics, Artificial Intelligence, and the Evolving Nature of Work. In B. George & J. Paul (Eds.), *Digital Transformation in Business and Society: Theory and Cases* (pp. 127–143). Springer International Publishing. https://doi.org/10.1007/978-3-030-08277-2_8
- [34] West, D. M. (2015). What happens if robots take the jobs? The impact of emerging technologies on employment and public policy. 22.