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The Effect of Artificial Intelligence on Future Jobs: A Systematic Analysis and Literature Review

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ABSTRACT

Artificial intelligence may bring both challenges and opportunities to human resource management, especially with regard the future jobs. The current study develops research in a systematic and transparent using a comprehensive literature review methodology and analysis of the existing literature on artificial intelligence and how it will affect future jobs. The results of this study show that, as artificial intelligence develops, people can acquire specific skills like problem-solving, critical thinking, communication, teamwork, and innovation to stay competitive in the labour market and possibly mitigate the effects of job displacement. This study concludes that in order to assist workers in becoming more fulfilled and meaningful members of society, employers, employees, and society at large must modify these changes. Further research is needed to provide further insight and fill gaps between artificial intelligence and future jobs.

1. Introduction

Artificial intelligence quickly affects every aspect of our lives in the form of autonomous cars, virtual reality experiences and automated assistants. AI has already replaced human labour in previously uncomputerizable areas. Forecasts indicate that labour will be significantly displaced by technology in the future, which, if unchecked, could lead to catastrophic levels of unemployment in society (Bruun & Duka, 2018). Technological developments in automation and artificial intelligence could cause a major disruption in the labour market. Artificial Intelligence and automation can enhance employee efficiency; however, they can also replace human labour and will likely alter most jobs somehow (Frank, Autor, Bessen, Brynjolfsson, Cebrian, Deming & Rahwan, 2019). The goal of artificial intelligence, a scientific field with roots in computer science that dates to the 1940s and 1950s, is to replicate computer cognitive functions through various techniques. John McCarthy, one of the field's pioneers, along with Allen Newell and Herbert Simon, first used the term "artificial intelligence" in 1956 (Benhamou, 2020).

The area of artificial intelligence (AI) is undergoing rapid advancement due to the convergence of numerous crucial technological enablers. Artificial intelligence is now extensively used and significantly affects daily life tasks and work. The continuation of this process is likely to result in significant economic and social modifications. To reap the enormous benefits of artificial intelligence while mitigating its negative consequences, many stakeholders must act wisely (Feijóo, Kwon, Bauer, Bohlin, Howell, Jain & Xia, 2020). Technological and social change is a hot topic in today's global debates. Artificial intelligence refers to the class of technologies that perform computational tasks previously assigned to humans (Benhamou, 2020). The exponential advancements in automation, robotics, machine learning, and artificial intelligence rapidly change global societies and industries. We anticipate a speed and scale of change in our way of living, working, and interacting with others that has never been seen before. On the one hand, this new industrial revolution is anticipated to enrich and improve our lives and societies. However, it could also bring about significant changes to our way of life and social mores (Wang & Siau, 2019).

Artificial intelligence may soon be able to perform tasks that are more complex than those performed by humans due to rapid technological advancements. Therefore, many companies have been impacted by artificial intelligence, which has caused an increasing concern that intelligent machines will soon replace many humans in various jobs. Government and policy organizations, private companies, and research institutes have studied artificial intelligence systems and their social implications in recent years. It is still unclear how AI will affect automation and current working conditions, which has contributed to a particular interest in applications of AI in future jobs. This study highlights the ongoing discussion regarding artificial intelligence's effects on future jobs. The first section briefly introduces artificial intelligence and the study's problem statement. The next section discusses a literature review of artificial intelligence and the limitations of artificial Intelligence. Future skills for career development are presented in section five. The following section offers a

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brief sketch of the artificial intelligence in healthcare. The final section concludes with a brief discussion of the study's overall conclusions, limitations, and implications. It also identifies possible research topics for the future.

2. Literature Review of Artificial Intelligence

Many studies have found that artificial intelligence and automation will raise worker productivity in several sectors, and in others, it could replace the work they do. Petropoulos (2018) indicates that because of the remarkable development in technology, the relative demand for skilled, well-paid jobs, which usually require non-routine cognitive skills, has increased. The relative demand for lower-wage and low-skilled jobs, which are jobs with non-routine manual skills, has increased. At the same time, demand for "middle" jobs, which typically require routine manual and cognitive skills, will decline. This is called job polarization. Asemoglu and Attor (2011) reported the same research results in the United States, while Darvas and Wolf (2018) found similar results in European Union countries, including Italy, the United Kingdom, France, and Germany. Lewicki et al. concluded that automation technologies have replaced many manual jobs, or what is known as blue collar jobs, it is currently taking over white-collar jobs as well. Jackson et al. evaluated the social impact of robots in the workplace by hypothesizing that increased use of robots is likely to reduce bias in the workplace environment. He suggested that the increasing use of robots reduces religious, social, and other biases between individuals and groups.

When talking about production, artificial intelligence is an effective input into many sectors of industry, and it may eventually replace human resources. Morikawa (2017) collected survey data from more than 3,000 Japanese business enterprises operating in the industrial and service sectors to determine their views on the impact of artificial intelligence on business and the management of the employment process in the future. It resulted that companies have expectations of a positive impact of artificial intelligence and robots in the conduct of business and believe that upgrading human capital is crucial and necessary. That is, the method of employment will not remain the same in the future. Looking from a healthcare perspective, artificial intelligence, for example, can interpret complex clinical images with remarkable accuracy that rival's today's highly experienced radiologists and may eventually replace them. At the same time, some believe that artificial intelligence will enhance the work of radiologists without replacing them. Another opinion says that artificial intelligence will indeed replace radiologists at some point in the future. However, it is still expected to happen in the distant future, so there is no need to worry (Pearson, 2017). However, Recht & Bryan (2017) point out in a careful opinion that AI will become a routine part of radiologists' daily lives, making their work more efficient, accurate, and valuable.

From a longer perspective view, we say that artificial intelligence cannot yet replace clinicians, due to the limitations of the matter. Krittanawong (2018) believes that artificial intelligence cannot initiate a conversation or high-level interaction with patients and reassure them, gain their trust, or show empathy with them, which are important matters in determining the relationship between the doctor and the patient. However, it is believed that this matter will end with the ability of artificial intelligence in the future to conduct a therapeutic medical conversation with the patient. There will still be a need for doctors in cases of traditional physical medical examination to interpret and diagnose ambiguous and difficult cases, especially in the field of neurology, which require a high-level conversation between the patient, the specialist, and critical thinking despite the expectation that artificial intelligence will be able to perform this skill in due course (Krittanawong, 2018).

3. The Limitations of Artificial Intelligence

Despite recent significant advancements, artificial intelligence is still unable to match humans for complex tasks or activities due to a number of limitations. The incapacity to comprehend and elucidate intricate mechanisms that defy deterministic laws, as well as the quality and accessibility of large data, are the primary causes of these limitations (Benhamou, 2020). Artificial intelligence has the potential to fundamentally alter people's and organizations' interactions with technology and information. They are, however, subject to the limitations of information associated with the way information evolves in information ecosystems, just like any other form of information processing (Walton, 2018). Bruun and Duka (2018) propose Unconditional Universal Basic Income as a means of mitigating future technological unemployment. It is a periodic, unconditional income transfer from the government to all members of society. This proposed plan includes a workable timeline that would see a government take this idea from the conceptual stage and implement it nationally within ten years. It can be financed by a special tax on those industries that use robotic labour.

4. Future Skills for Career Development

Values and skills are important to apply AI effectively and wonderfully in all aspects of work and education as well. There is also a need to develop values and skills that enable everyone to participate in all aspects of theoretical life in the age of artificial intelligence; this requires developing individuals in the skills required by the labour market across all levels of society. Artificial Intelligence can be applied to a wide range of business sectors and areas, and this scope is expected to increase and expand in the future. In addition, the demand will increase for people who specialize and even do not specialize in artificial intelligence. They will be required to integrate artificial intelligence into their work sectors successfully and effectively. On the other hand, there are great concerns about the impact of artificial intelligence on the

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labour market, most notably those concerns related to the gaps between the skills in our current era and those required in the age of artificial intelligence. Therefore, there is a tendency to focus on developing the required skills (Shiohira, 2021). In fact, high-level skills are associated with a wide range of skills required in artificial intelligence in different sectors and fields of work, and there will be a demand for these relevant skills to work in sectors related to artificial intelligence. Therefore, artificial Intelligence is rearranging the relationship between the workforce and machines, and the importance of AI is growing exponentially and increasingly affecting how we learn and do work (de Laat et al., 2020; Siemens et al., 2022; Yang et al., 2021). The main skills required in AI are as follows (White, 2024).

4.1 Problem Solving

The importance of artificial intelligence stems from its attempt to understand the perception and thinking processes that are used to solve problems effectively and successfully, and artificial Intelligence enables sophisticated programming techniques that assume that the way knowledge is acquired, organized, accessed and modified in both workforces and machines gives the basis for problem-solving and "intelligent" decision making, solving problems is considered one of the important and necessary skills required for education, practice and the future of work. It is defined as "the ability to analyze information and transform it as a basis for making decisions and moving toward solving practical problems" (Smith, 1984).

Therefore, the field of problem-solving is extremely important because of the need for a future that is significantly and decisively characterized by innovation (Kirn & Benson, 2018). The field and skill of problem-solving is an important field of knowledge for the next generation in developing the future, which must be characterized by innovation and develop solutions to "the global technological, economic and social challenges of the twenty-first century" (Redish & Smith, 2008; Rampersad, 2020).

4.2 Critical Thinking

Many startups fail because of the risks, so critical thinking is important and crucial in entrepreneurship education (Huq & Gilbert, 2017). Critical thinking is thinking logically, analytically, conceptually, and reflectively (Hager and Holland, 2006). Applying critical thinking in risk-removal activities and modifying different work processes and sectors is vital and effective for the success of innovation; investors typically need this critical thinking to ensure they get a return on their investment by promoting effective innovation (Rampersad, 2020). Phillips and Bond (2004) found that there is a decline in critical thinking skills globally despite the great focus on it in education at higher levels. Graduate Careers Australia 2007 surveyed a number of Australian employers and concluded that critical thinking is the second highest selection criterion required in the recruitment process.

The bottom line is that there is a strong focus on developing human intelligence and thought, starting with young children and with the active support of artificial intelligence. Therefore, the funding and support allocated to the development of artificial intelligence should not underestimate the importance of developing human intelligence and critical thinking (Spector & Ma, 2019).

4.3 Communication

Communication is an important factor affecting innovation in the modern era (Rampersad, 2020). Communication refers to "the ability to use language, symbols, and text interactively" (Rychen, 2002). It includes verbal and written communication and participation in dialogues (Jackson & Chapman, 2012). Communication is strongly linked to the innovation required at work, and the factors of transparency, codification, comprehension, and credibility fall under it, as they are all essential to achieving successful innovation in the age of artificial intelligence (Moenaert, Caeldries, Lievens, & Wauters, 2000).

Many people suffer from the problem of not interacting effectively in society. Therefore, they are more likely to face problems of fear of meetings or avoid presenting their ideas in meetings. Therefore, artificial intelligence provides them with an opportunity to practice public speaking skills. This application will work on artificial intelligence models to modify voice, facial expressions, natural language processing, and creative learning; this application will be useful for students who need interview skills and also for people who need guidance to improve their communication skills in interviews (Jadhav et al ., 2023).

4.4 Teamwork

The ability to work beneficially with another group to accomplish a task is what is known as teamwork ((Knight & Yorke, 2004). Interest in developing teamwork skills in the educational field is increasing, and the reason lies in its educational effectiveness, in addition to the fact that companies are constantly organizing their employees into teams to work on implementing complex projects (Alberola et al., 2016)

Artificial intelligence is currently at the beginning of its focus on leadership and work teams and will work to increase expansion and improvement, which will provide a great opportunity to improve and develop the idea of teamwork in the

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future (Webber et al., 2019). And artificial intelligence may enter the decision-making process and influence human leadership (Parry et al., 2016; Kaplan and Haenlein, 2019).

It is expected that artificial intelligence will facilitate and develop teams in multiple areas of work. We note that its use is currently limited in artificial intelligence, which greatly reduces the adoption of artificial intelligence to develop the effectiveness of teams; the use of artificial intelligence in team diagnosis and development is a major shift in the approach used by contemporary organizations to promote better teamwork (Webber et al., 2019).

4.5 Innovation

Smart communities and cities (IC) is an emerging idea that aims to enhance and innovate a work environment that improves cognitive skills and the ability to learn creativity and innovation. They are environments that support capacity building, superior cognitive thinking, and collective creativity stemming from individual skill sets and information systems in the fields of work, whether physical, institutional, or digital (Komninos, 2006). Innovation management carried out by individuals plays an active role in organizations and can reinvent itself through exploratory initiatives. However, AI offers a useful role beyond the capacity of humans (Groves et al., 2013; Wamba et al., 2017).

Artificial Intelligence is actively reshaping organizations and reorganizing innovation management. In line with advanced technological development and the development of human organizations, the use of artificial intelligence may force management to reconsider the entire innovation process in the organization (Haefner, Wincent, Parida, & Gassmann, 2021). The possibility of applying artificial intelligence in the innovation environment through the increasing development of artificial intelligence and the optimal use of machine learning indicates a major and interesting change coming in the future (Lu, 2019; Varian, 2018; Ward et al., 2014). However, very little has been found regarding the limitations of AI in innovation.

Therefore, it is the responsibility of innovation managers to find ways to apply artificial intelligence to the organization's innovation processes because of its great importance. On the one side, it can better respond to the increasingly competitive environment and the increasing flow of information around it. On the other side, using artificial intelligence to support innovation can provide real value to organizations by reducing exposure to the risks of innovation processes and reducing their cost (Haefner et al., 2021).

4.6 Artificial Intelligence in Healthcare

The application of AI technologies in the field of healthcare promotes disease prediction, diagnosis, and treatment, which is advantageous to patients as well as healthcare providers. One of the most intriguing uses of AI in healthcare is the potential to increase diagnostic precision. Compared to most medical professionals, AI can help healthcare providers diagnose symptoms more quickly and effectively (Guo, Hao, Zhao, Gong & Yang, 2020). However, Habli, Lawton & Porter (2020) indicated the possibility of developing AI-powered health applications that can match or surpass the performance of medical professionals in particular domains. These applications may contribute to addressing significant global issues, such as the disparities in healthcare access in low-resource nations and the scarcity of physicians to meet the demands of an ageing population. On the other hand, the healthcare industry is a complicated and safety-sensitive field where technological malfunctions can directly cause patient harm.

There is optimism and expectations that the application of artificial intelligence will provide significant improvements and developments in areas of health care, ranging from disease diagnosis to treatment. The performance of artificial intelligence is equal to or even better than the performance of individuals in various tasks, including analyzing medical images or diagnosing and describing diseases based on vital indicators in medical records (Miller & Brown, 2018). The need for health care services is constantly increasing, as many countries suffer from a shortage of health care practitioners in various fields, especially doctors. Healthcare institutions work hard to keep pace with emerging and new technological developments and meet patients' expectations regarding the expected service and desired results (Kirch & Petelle, 2017).

The development of modern technology, especially wireless technology, has provided a new form of providing health care services via remotes and wireless interactions. Its effectiveness lies in the fact that it is available everywhere and at any time, and the greatest benefit from it is in places that suffer from scarcity or absence of specialists, which helps reduce costs and reduce exposure to diseases, especially infectious ones in health care clinics (Combi, Pozzani & Pozzi, 2016).

According to Jennifer (2017), it is expected that artificial intelligence can provide improvements and developments in healthcare performance and delivery. For example, annual health estimates show that applications of artificial intelligence are capable of reducing health care costs in the United States by 150 billion US dollars annually in 2026, and this is considered an important incentive to start using and applying artificial intelligence by changing the pattern of health care from a reactive style to a proactive style, focus on managing and promoting health before treating diseases. Therefore,, fewer hospitalizations, fewer doctors' consultations, and fewer treatments. Therefore, monitoring, early diagnosis, effective tailored treatments, and better follow-up are all advantages provided by the use of artificial intelligence technology to maintain the continuity of individuals' health.

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Opinions differed about the most effective applications of artificial intelligence to facilitate and develop health care performance. Forbes in 2018 indicated that the most important and most effective areas are administrative workflow, medical image analysis, the use of robots in surgery, virtual assistants, and support for critical clinical decision-making. As for the results of an Accenture report for the year 2018, they include support for the same areas, in addition to connected devices, fewer errors in determining the appropriate dose, and cyber security. The McKinsey report for 2019 talked about other areas, such as connected and cognitive devices, targeted medicine, robotic surgery, and electroceuticals.

5. Conclusion

The potential effect of artificial intelligence on jobs in the future is a topic that has been extensively researched; numerous studies have investigated this intricate and multidimensional issue. In summary, artificial intelligence will have a wide range of effects on jobs in the future. Even though job displacement is a concern, there are also chances to innovate, build new positions, and advance current roles. A proactive approach to education, training, and workforce development will be necessary for the successful integration of AI into the workforce.

The findings of this study indicate that, as artificial intelligence develops, people can acquire specific skills to stay competitive in the labour market and possibly reduce the effects of job displacement. Considering the growing prevalence of artificial intelligence, the following essential future skills for Career development may be useful: problem-solving solving, critical thinking, communication, and teamwork innovation.

As a result, we believe that the state ought to consider the formulation and advancement of educational initiatives pertaining to artificial intelligence, as they are considered to be essential to the rapid economic growth of the state. In this sense, funding is essential to the creation and functioning of technology parks. Each of these attempts will contribute to the continuous growth and progress of the country's actual economy. The paper presents a comprehensive overview of AI-related research in the field of future jobs, assisting policymakers, academics, and professionals in better understanding the development of future jobs related to artificial intelligence research and its potential practice implications. Future research should focus on filling gaps between artificial intelligence and future jobs.

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