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LITERATURE REVIEW ON THE IMPLEMENTATION OF AI AND AUTOMATION IN THE PUBLIC AND PRIVATE SECTORS

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Abstract

The implementation of artificial intelligence (AI) and automation in the public and private sectors, highlighting the benefits as well as the challenges it faces. Studies show that the implementation of AI and automation can improve operational efficiency, accuracy, and personalisation of services in various sectors. In the public sector, these technologies help speed up administrative processes, predict community needs, and optimise resources. On the other hand, the private sector is adopting AI to improve productivity, design personalised customer experiences, and support business decisions with in-depth data analysis. However, the study also identified significant challenges, including limitations in technology adoption, gaps in access and expertise, and ethical and privacy issues. Addressing these challenges requires collaboration between stakeholders to develop policies that support workforce retraining, data regulation, and ethical frameworks. With the right approach, AI and automation have the potential to have a broad and sustainable positive impact on social and economic well-being in both the public and private sectors.
***Keywords**: Ai Implementation, Automation, Public and Private Sectors*

Introduction

Since the development of the industrial revolution 4.0 era, artificial intelligence (AI) and automation technologies have become the main pillars of change in various sectors of life, both public and private. Artificial Intelligence (AI) is a field of computer science that focuses on creating systems capable of performing tasks that normally require human intelligence (Martinho et al., 2021) . These tasks include, but are not limited to, speech recognition, facial recognition, natural language processing, decision making, and language translation. AI leverages algorithms and data to model the way humans think and solve problems more efficiently and quickly. With the advancement of technology and research, AI has developed into an essential component in various fields such as healthcare, finance, education, and transportation (Tussyadiah ., 2020)

Automation, on the other hand, is the use of technology to perform tasks or processes with little or no human intervention. Automation can cover various aspects such as manufacturing processes, data management, customer service, and more. With the implementation of automation systems, businesses and organisations can improve operational efficiency, reduce human errors, and reduce operational costs. Automation often utilises AI components to increase the flexibility and adaptability of the system to changing conditions and environments. The combination of AI and automation paves

the way for more significant innovations and can transform various industries (Dhieb et al., 2020) .

These technological advancements offer great opportunities to improve efficiency, productivity, and service quality. The opportunities offered by Artificial Intelligence (AI) and automation are vast and diverse across sectors. In business, AI has the potential to transform the way operations are conducted by analysing large amounts of data to gain deeper and more predictive insights (Zhou et al., 2020) . For example, AI can help companies improve marketing strategies by segmenting and targeting audiences more accurately. Automation can also take over routine and repetitive tasks, freeing up employees' time to focus on more valuable and creative work. In the manufacturing industry, robotics automation can increase production speed while ensuring product quality and consistency (Tanveer et al., 2020) .

Additionally, in healthcare, AI and automation offer opportunities to improve patient diagnosis and treatment. AI can process and analyse medical images more quickly and accurately than human methods, assisting doctors in detecting diseases earlier. Automation in pharmaceuticals enables large-scale manufacturing of drugs with high precision. In the transport sector, technologies such as autonomous vehicles can transform urban mobility models, reducing congestion and improving road safety. Overall, the application of AI and automation presents opportunities to improve efficiency, innovation, and quality of life for the global community (Suksi, 2021) .

However, the adoption of these technologies also brings with it new challenges. Therefore, it is important to deeply understand the dynamics surrounding the implementation of AI and automation in order to take wise steps in utilising these technologies.

Against this backdrop, the literature review can provide a comprehensive insight into how AI and automation can be integrated in various sectors and what steps need to be taken to overcome the various challenges that arise.

Research Methods

The study in this research uses the literature method. The literature research method is a systematic process of identifying, evaluating, and synthesising information from existing sources to answer specific research questions or develop an understanding of a topic. This process involves searching and selecting relevant literature, such as scientific journals, books, reports, and other documents related to the topic under study. Once the literature is collected, the researcher evaluates its quality and relevance and identifies findings, gaps, and trends that exist in current knowledge (Sahar, 2008) ; (Arikunto;, 2000) . Literature research is often used to develop theoretical foundations, support arguments, or formulate hypotheses in broader studies, as well as to inform future research directions (Fadli, 2021) .

Results and Discussion

AI and automation implementations differ in the public and private sectors

Artificial Intelligence (AI) and automation implementations have different characteristics and challenges in the public sector and the private sector, given the different objectives, regulations, and organisational dynamics in the two sectors. In the private sector, companies often adopt AI and automation to increase operational efficiency, lower costs, and improve customer service (Madan & Ashok, 2023) . For example, the manufacturing industry uses robotics to speed up production processes and ensure product quality, while the retail industry adopts AI-based chatbots and recommendation systems to improve customer experience and sales (Maragno et al., 2023) .

In the public sector, the main focus of AI and automation implementation leans more towards improving public services and administrative efficiency. For example, in public health, AI is used to analyse massive health data to predict and manage disease outbreaks. In the field of government administration, automation can help in managing population data, speeding up the document generation process, and reducing queues with automated services such as chatbots that help answer citizens' questions (Iyer, 2021) .

While the benefits of AI and automation are clear, the challenges of implementation are also significant and differ across sectors. In the private sector, companies may have to face the challenges of integrating new technologies with existing systems, impact on the workforce, and data security. Companies must also consider Return on Investment (ROI) and adapt quickly to technological changes to remain competitive. They have more flexibility in terms of spending and quick decision-making (Schiff et al., 2021) .

In contrast, in the public sector, the challenges are more related to bureaucracy, regulation and transparency. Procurement of new technologies in the public sector often goes through lengthy processes and requires compliance with various regulations and standards. In addition, the storage and use of data in public systems must meet very strict privacy standards. The implementation of new technologies must also be carried out in a transparent and accountable manner to maintain public trust (Kuziemski & Misuraca, 2020) .

The aspect that both sectors have in common is the need for training and upskilling of the workforce in order to utilise the new technologies. In addition, the importance of collaboration with technology experts and AI and automation solution providers is crucial in ensuring successful implementation (Chatterjee, 2020) . Thus, although the ultimate goal of AI and automation implementation may differ between the public and private sectors, both sectors have great potential to improve efficiency, performance, and service quality through the adoption of these technologies.

Challenges and Opportunities Facing AI Implementation

The implementation of Artificial Intelligence (AI) presents a number of challenges that organisations in various sectors, both public and private, must face. One of the main challenges is the issue of data privacy and security. AI requires access to large amounts of data to function optimally, and this raises concerns about how that data is collected, stored and used. Data leaks or unauthorised use of data can harm individuals and organisations and have serious legal consequences. As such, organisations must ensure that they meet applicable data privacy and security standards (Danish & Senjyu ., 2023)

In addition, there are also challenges related to the skills gap in the workforce. The implementation of AI often means that some jobs are automated, which can lead to a reduction in the need for certain skills, while increasing the demand for new skills related to managing and optimising AI (Munagandla et al., 2024) . This requires investment in training and development of the workforce so that they can adapt to the changes that AI technologies bring. Without these upskilling efforts, companies could face resistance from employees and society, as well as lose the talented talent needed to utilise AI effectively (Ballester, 2021) .

Despite its challenges, AI also offers promising opportunities for business transformation and public services. AI can improve operational efficiency by providing fast and accurate data analysis, which helps in strategic decision-making. In addition, AI enables better personalisation of services in sectors such as e-commerce, banking, and healthcare, by providing precise recommendations and real-time support to customers or patients. AI also has the potential to drive innovation by paving the way for the invention of new products and services that were not possible before (Alshahrani et al., 2022) .

By leveraging the opportunities available, organisations can achieve a significant competitive advantage in the marketplace. However, this requires a clear and comprehensive implementation strategy, including investment in adequate technology infrastructure, collaboration with AI experts and technology solution providers, and a commitment to ethics and social responsibility at every stage of implementation. With the right approach, AI is not only a tool to improve efficiency, but also a key driver in creating added value and driving sustainable growth (Galindo et al., 2021) .

In addition to the challenges and opportunities already mentioned, there are also regulatory and ethical aspects that need to be considered in the implementation of AI. Governments in various countries are working to formulate regulations that can govern the use of AI so as not to harm society. This includes creating standards so that AI technologies are developed and used in a transparent, fair, and accountable manner. Another challenge in terms of regulation is maintaining a balance between accelerating innovation and protecting the public interest. Regulations that are too strict may stifle

innovation, while regulations that are too lax may pose unintended risks (Enarsson et al., 2022) .

The human factor also plays an important role in AI implementation. There is still a lot of scepticism and uncertainty among the public regarding how AI will affect their lives. Effective education and communication on the benefits and risks of AI is essential to build public trust. There is also a need to develop inclusive AI, which considers the needs and rights of all groups of people without exception. Addressing concerns about bias and discrimination in AI algorithms requires a real effort to ensure that the training data used is representative and does not contain bias (Parycek et al., 2024) .

All in all, AI implementation presents a complex combination of challenges and opportunities that organisations must carefully address. A thoughtful approach involves the integration of technology and people, where AI is not a replacement, but rather a complement that can empower the workforce and improve the quality of various services. With careful planning and execution, AI has great potential to positively change the way we work, interact and live (Rizvi et al., 2021) .

Thus, while there are many challenges to overcome, such as data privacy, skills gap, regulation, and ethical issues, AI also offers great opportunities that should not be overlooked. Organisations that are able to overcome these challenges and take advantage of the opportunities can gain a competitive advantage and drive sustainable innovation. With a sound strategy, close collaboration between the public and private sectors, and a commitment to ethics and social responsibility, AI implementation can yield significant benefits to society as a whole.

The Impact of AI and Automation on Service Efficiency and Effectiveness

Firstly, AI and automation have a significant impact on service efficiency. By using algorithms that are able to process large amounts of data quickly and accurately, AI can speed up decision-making processes that previously took a long time if done by humans. For example, in the customer service sector, AI-powered chatbots can handle customer queries and issues in real-time, 24 hours a day without stopping. This not only reduces waiting time, but also allows service providers to handle larger volumes of requests without the need to increase staff (Stone et al., 2020) .

Furthermore, service effectiveness is also enhanced by the application of AI and automation. Machine learning algorithms can analyse patterns from historical data and offer more targeted and personalised recommendations. For example, in the healthcare sector, AI can assist doctors by providing more accurate diagnoses and personalised treatment plans based on analysis of patient medical record data. Thus, the resulting decisions are more data-driven and empirical, ultimately improving the quality of services provided to users (Khan & Al-Badi, 2020) .

Another impact is the reduction of human errors that often occur due to fatigue, stress, or negligence. Automated systems can perform a specific task perfectly every

time, without the variability that can occur in human-performed tasks. This is particularly important in industries that require a high degree of accuracy, such as manufacturing and finance. With fewer errors, the quality of products and services will improve, which in turn increases customer satisfaction. Satisfied customers are more likely to be loyal and return to use the service or product offered (Sharma et al., 2020) .

However, it is also important to recognise that the increased efficiency and effectiveness brought about by AI and automation also brings challenges. One of the most pressing is how industry and labour can adapt to these changes. Many purely routine and repetitive jobs will be replaced by automation, so there is an urgent need for reskilling and upskilling among the existing workforce (Horowitz et al., 2022) . Job roles will increasingly focus on more complex and creative tasks that cannot yet be automated, requiring emotional intelligence, problem solving, creativity and other skills unique to humans. Proactive training and development initiatives will be critical to ensure that workers are able to transition into new roles, so that the positive impact of automation can be optimally felt across Society (Chilunjika et al., 2022) .

The development of AI and automation also brings significant social and economic implications. On the one hand, automation can bring massive efficiencies in various industrial sectors, meaning operational costs can be reduced and products or services can be provided at more competitive prices. On a macroeconomic scale, this can spur economic growth and create new opportunities in previously unreachable sectors (Mor & Gupta, 2021) . On the other hand, this transformation can also lead to inequality, especially if marginalised segments of workers are unable to access training or the new networks of opportunities that emerge. Therefore, the role of governments, the private sector, and educational institutions is crucial in ensuring the inclusiveness and sustainability of these developments (Adewusi et al., 2024) .

The adoption of AI and automation is also fuelling continued innovation. New industries based entirely on these advanced technologies are starting to grow, creating job opportunities in information technology, data analytics, cybersecurity, and others. For example, the rise of automated vehicles and smart homes has not only changed the way we live, but also opened up new markets that require specialised skills and knowledge. These innovations are also penetrating into traditional sectors such as agriculture with smart farming models that use sensors and data analytics to increase production and efficiency (Aderibigbe et al., 2023) .

Meanwhile, it is important to highlight the ethical aspects that come with the adoption of AI and automation. Questions regarding data privacy, algorithmic bias, and responsibility for decisions taken by automated systems must be taken seriously. Stakeholders, including governments, tech companies, and civil society should work together to create policies and regulations that ensure AI is used ethically and responsibly. Awareness and strict oversight of these ethical standards and regulations

will ensure that technology is implemented for the public good without infringing on the rights of individuals (Medaglia et al., 2023) .

Overall, AI and automation are having a broad and profound impact on the efficiency and effectiveness of services across industries. While the advantages in terms of speed, accuracy, and personalisation are clear, it is important not to overlook the emerging challenges related to workforce adaptation, economic disparities, and ethical implications. With careful planning, extensive retraining, and inclusive policies, society can capitalise on the opportunities offered by these technologies while mitigating their potential impacts. Ultimately, success in integrating AI and automation into our daily lives will largely depend on our ability to innovate while maintaining human values and justice.

Conclusion

The implementation of AI and automation in the public and private sectors shows that these technologies bring significant benefits in terms of efficiency, accuracy, and personalisation of services. In the public sector, AI can improve the quality of government services by reducing waiting times, predicting people's needs, and optimising the use of resources. For example, AI can be used for big data analysis to detect fraud or identify areas that need quick intervention. In the private sector, AI helps companies improve productivity, personalise customer experience, and make better business decisions based on in-depth data analysis.

However, the literature review also revealed several challenges that need to be addressed, including limitations in technology adoption, inequality in access and availability of training, and ethical and privacy issues. These challenges require serious attention from various stakeholders to ensure that the adoption of AI and automation does not only benefit a few, but also provides broad and inclusive benefits. Policies that support workforce retraining, regulations governing the use of data, and ethical frameworks governing the development and implementation of AI technologies are needed. With proper management, AI and automation can be powerful tools to improve social and economic welfare in both sectors.

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