



Full length article

# AI in Data-Driven Decision Making, Organizational Change, and Ethical Considerations in Business Strategy

Avesta Shahbazi<sup>1\*</sup>, Mahdi Jafari<sup>2</sup>, Mohammed Kawsar<sup>3</sup>, Sodaif Janani<sup>4</sup>, Samir Nadra<sup>5</sup>

1 MSc Student Data Analysis, De Montfort University, Leicester, England

2, 3, 5 MSc Analytics Information Management, Palumbo-Donahue, School of Business, Duquesne University, USA

4 Information Technology (IT) Manager of Salamat Protein Iranian, Iran

\*Corresponding e-mail: [avesta.shahbazi@hotmail.com](mailto:avesta.shahbazi@hotmail.com)

## Article Info

Received: 17.10.2025

Accepted: 01.11.2025

Available online: 30.01.2026

## Keywords:

AI, Business strategy, organizational change, Data-driven decision making

## DOI:

<https://doi.org/10.59857/wpgh3w33>

## ABSTRACT

The report examines how Artificial Intelligence (AI) has revolutionised learning and competence building around programming skills, especially how it is being used in individualised learning, AI-based educational portals and the development of programming abilities. Online learning platforms such as Coursera, edX, and AI-based tutoring systems have now integrated AI to give personalised suggestions, monitor progress and offer immediate feedback. Intelligent machines such as GitHub Copilot and Replit are also transforming the way people learn to program as they help in generating code, debugging errors, and provide real-time instruction. Another finding of the report is the impact of AI on the kind of competencies needed in the technology sector. The ever-growing need to be AI-friendly among programmers has increased as AI tools become a major asset in most industries. Nevertheless, in spite of its positive aspects, the report also considers some of the central challenges surrounding the implementation of AI in education. Also, the ethically problematic aspect of AI in education includes issues concerning the privacy of data, biases of algorithms, and transparency. At its conclusion, the report makes several recommendations to educational institutions, businesses, and policymakers to prioritise the ethical use of AI, encourage fair access to AI tools, and invest in the education of educators and workers to best use AI technologies.

## 1. Introduction

Artificial Intelligence (AI) is no longer a myth and has grown to become a disruptive application that is changing the face of all industries globally. Amidst the current business environment that is dynamic in every manner, organisations are feeling the pressure to embrace new technologies in order to sustain competitiveness. The transformation is driven by AI, which can analyse huge volumes of information to identify trends, create predictive models, and much more. Through the use of AI, companies may arrive at better, more precise, and concurrent choices, ultimately bettering their strategic course and operational productivity (Schmitt, 2023). The

implications of AI go much beyond the automation of routine chores or efficiency. It has become a vital part of the business strategy, and it can provide an organisation with a competitive advantage. Machine learning, natural language processing, and predictive analytics are AI technologies that allow businesses to develop more targeted and data-driven strategies reflective of current market trends (Alenezi & Akour, 2025). As discussed by Jafari et al. (2025), the strategic integration of AI can enhance competitive advantage through dynamic decision frameworks and adaptive planning models. Such features empower commercial enterprises to derive meaningful insights, understand the needs of their customers, and respond to market trends in a more efficient manner than classical methods could enable.

Further, AI is not just transforming the decision-making process, but is also serving a great role in change management in organisations. With companies implementing AI in their processes, there is a demand to change the way the company works, reshape its conformist management and create new agile strategies to react to inner and external pressures. The protocol of incorporating AI is transforming corporate culture, encouraging innovation, and stimulating change in employee interactions with technology (Schwaeke et al., 2025). This type of organisational change is essential to business agility and preparing companies to last in a rapidly changing competitive environment that is getting more focused on technology (Alamu, 2025). However, when AI is a part of business strategies, ethics are critical. One express doubt about the privacy, unfairness in algorithmic decision-making, and the risks of being fired because of the increased implementation of AI. It is possible to prevent unintended consequences and to keep consumers' and employees' trust in reputable organisations through ensuring transparency, accountability, and a sense of fairness of AI implementations (Floridi & Cowls, 2019). These ethical issues are pivotal in ascertaining that the incorporation of AI in business plans should be mutually beneficial to the company and the wider society.

This paper aims to present a detailed discussion on the nature of AI changing business strategies, specifically in the areas of data-driven decision-making, managing organisational change, and ethical aspects. It will not only raise awareness of the opportunities and challenges AI poses to the business world but also of the possible long-term consequences that it will have on the employees, managers, and organisational behaviours in general. The paper will also cover the extent to which AI may be implemented into these contexts successfully, as well as debating the nature of the ethical issues caused by its implementation in business strategy by examining already available case studies and literature. Moreover, the paper will analyse the larger aspect of AI on the education systems, specifically how it facilitates programming skill building and dictates the future of the learning environment.

The scope of the paper covers four primary areas. The first is an examination of the role of AI in data-driven decision-making and the role that AI tools and algorithms are playing in business decision-making. Second, the paper will discuss the application of AI in managing organisational change, including the impact AI has on promoting change processes and organisational culture. Third, the ethical aspects of AI in business strategy will be presented, including problems of transparency, accountability, and the protection of the privacy of data. Lastly, a discussion of the impact of AI on education, namely the increasing role that AI has played in the design of programming skills and learning techniques, will be examined.

The thesis of this paper is that AI is not only a driver of technological advancement but also a powerful tool for reshaping business strategies in data-driven decision-making, organisational change, and ethics. Nonetheless,

when it is incorporated into business strategy, it should be carefully considered whether this idea has any ethical issues and what its overall impact on society is. The objective of this paper to focus on how AI can be effectively implemented in business processes and its ethical challenges addressed successfully with a beneficial but not destructive influence on society and business performance.

The paper is structured into several sections. Following this introduction, Section 2 will delve into the role of AI in data-driven decision-making, discussing how AI technologies help businesses make more informed and effective decisions by analyzing vast amounts of data. Section 3 will explore AI's impact on organizational change management, focusing on how AI tools assist businesses in managing change processes, improving organizational agility, and fostering a culture of innovation. Section 4 will address the ethical considerations that accompany the use of AI in business, examining the challenges of data privacy, algorithmic bias, and transparency. Section 5 will shift the focus to the educational domain, analyzing the role of AI in enhancing programming skills and the broader implications for education systems. Finally, Section 6 will conclude the paper by summarizing the key findings and offering recommendations for the ethical integration of AI into business strategies.

## **2. The Role of AI in Data-Driven Decision Making**

Artificial intelligence applications in the decision-making process have helped facilitate the manner in which companies process their data and make crucial decisions. With the help of AI technologies, organisations can process much more data in a shorter time and make it more accurate, informed, timely, and effective. This can be explained by AI contributions to the data-driven decision-making (DDDM) and the significant impact that it will have on business performance, which is the focus of this section.

### **2.1 Introduction to Data-Driven Decision Making (DDDM)**

Data-driven decision making (DDDM) refers to a decision-making process that is reliant on the analysis of information and outcomes of such analysis, with the most important determinant being the usage of data in contrast to intuition or personal experience. The insights can also equip organisations with a way to minimise uncertainty by making certain decisions based on a large amount of information, thereby enhancing the quality of the choices (Schmitt, 2023). This has become more pronounced in the current world driven by data, where companies across industries are attempting to exploit data in their more efficient and effective operations.

The presence of DDDM has gained importance, especially due to the mounting pressure on businesses because of increasing competition and the demand for more businesses to have immediate and dynamic strategies. Due to the emergence of big data and sophisticated analytics technology, those in the position of making decisions in business today have a much stronger likelihood of navigating through the murky waters of a complex business environment (Abdellatif, 2025). The combination of Artificial Intelligence (AI) technologies has added even more value to DDDM as it offers the tools that are able to analyse significant amounts of data, find patterns and offer predictive results in real-time. AI is a particularly important factor in the use of DDDM because corporate clients want to mechanise decision-making systems but incorporate moments of higher response quality and speed. Machine learning, predictive analytics, and deep learning are AI-powered solutions that are transforming how businesses collect data, analyse data, and put it into action. This paper investigates the synergy between AI and DDDM and will allow it to be fully analysed concerning AI technologies that enable data-driven decision-making, how those technologies drive business results, and the obstacles to organisations using AI to make strategic decisions.

## 2.2 AI Technologies Facilitating Data-Driven Decision Making

Artificial intelligence has significantly transformed the space around data-driven decision-making and provided the organisation with new capabilities to control the volume and analysis of data. Among the key AI technologies which have been generalised to decision-makers are machine learning, predictive analytics, and deep learning. Machine learning (ML) is a branch of AI that endows systems with the capacity to learn by themselves. When companies apply ML in their organisation, they can extract trends in a mass of data and use them to make predictions about what is to be expected. In decision-making, ML models can predict, test, and suggest on future demand, behaviour of the customer, and the right course of action on the basis of historical data (Abdulrahim et al., 2025). Another example in which predictive analytics has found a fundamental niche is in the retail sector, which is indiscriminately used in the management of inventory, sales forecasting, and personalised recommendations (Alenezi & Akour, 2025).

Retail chains such as Amazon and Walmart have employed the use of predictive analytics in streamlining their supply chain and reducing wastages, making their inventory management systems much more efficient. They can predict consumer demand since such AI-driven systems analyse historical sales, and outside conditions such as weather or economic conditions to help control their inventory more effectively (Aktas & Meng, 2017). With the future evolution of predictive models, companies have turned more to the use of AI to streamline many of their business processes, such as supply chains and customer targeting efforts.

The other subcategory of AI, deep learning, uses artificial neural networks of multiple layers to process large and complex data. The technology is especially applicable in cases of decision-making when the data is highly complex, namely, related to image or speech recognition (Al-Surmi et al., 2021). One area that has already been deployed to deep learning is self-driving cars, where data processing in real-time is critical to making real-time decisions. The use of deep learning systems in marketing is also making headway with sentiment analysis, where the organisation can monitor the emotions of their customers and adjust its approach (Chhatre & Singh, 2024). Businesses which must act promptly when it comes to taking advantage of new trends or market developments must use real-time data processing. As an illustration, AI systems are employed by the financial industry to track and intervene in market changes as they occur, which allows them to change investment policies or risk management procedures on the fly (BaniHani et al., 2024). Millions of data points can be processed by AI algorithms simultaneously and in real-time, and the resulting patterns and decisions cannot realistically be copied by a human being at that scale in terms of time.

Some companies have managed to adopt AI-driven systems in order to improve decision-making processes. As an example, Google uses AI-based technologies to make placements of ads as efficient as possible, helping them reach the right audience. This application of both machine learning and real-time information enables Google to optimise its advertising tools continuously, raking in more advertising funds and retaining its spot as a frontrunner in online advertising (Khan et al., 2024). Within the financial sector, AI is already being used in the area of fraud detection, which could take the form of machine learning models, by combing through the data relating to transactions to identify suspicious tendencies. The systems are also capable of detecting fraud trends in real-time, therefore, reducing the odds of losses (Schwaeke et al., 2025). In healthcare, AI is helping doctors learn things about illnesses through improved diagnosis, and they can do it quickly. Machine learning algorithms are analysing medical imaging, e.g. X-rays and MRIs, to identify any anomalies that could otherwise be overlooked

by human doctors. AI is used in such a way that it is more precise in disease diagnosis and, at the same time, less time-consuming in the analysis and thus quicker in the selection of treatment options and patient outcomes (Mudgal et al., 2022).

### **2.3 Impact of AI on Business Outcomes**

The incorporation of AI in business decision-making processes has far-reaching consequences on business outcomes. It improves speed, consistency, affordability, and scalability of decision making; all these are essential in competitive markets. The capabilities of AI enable companies to decide instantly and make decisions based on huge amounts of data, which would not have occurred in business many years ago. Decision-making is particularly important in areas such as finance and retail, where quick decisions might make the difference between profit and loss. As an example, AI in the stock market use predictive algorithms which can make trades and follow trends in milliseconds on minor market fluctuations that the human traders would not notice (Schmitt, 2023). Moreover, AI enhances decision accuracy as it negates human errors and biases that usually limit vision and lead to ineffective decisions (BaniHani et al., 2024).

AI creates fewer expenses because the need to intervene with the actions and processes of decision-making is decreased by automation. Artificial intelligence is able to perform routine jobs, and its implementation will help human workers address more strategic, complex tasks. In production, AI-predictive maintenance can offer predictive failure of equipment and minimise maintenance and repair time (Tsamados et al., 2021). In addition to that, AI systems can be very scalable, as a business may decide to scale up its operation without a proportional increase in its resource allocation. With the scale of the company, AI-based decision-making is ever more useful when it comes to the preservation of efficiency on a more significant scale (Alamu, 2025).

AI is transforming decision-making in many areas of business; some of these include marketing, finance, operations, and human resources (HR). In the field of marketing, AI allows for recommending products and advertising them directly to the customer, enhancing their involvement and sales. Artificial intelligence examines consumer behaviour and finds patterns that could otherwise be overlooked by human marketers, and presents personalised content or offers to their recipients, raising conversion rates (Haleem et al., 2022). In finance, AI applications evaluate risk, manage portfolios, and optimise investment strategy. Financial institutions use AI to predict market trends so that investment decisions are made in line with market conditions and the risk levels (Babalghaith & Aljarallah, 2024). Prevention of financial crime is also an important application of AI in terms of detecting unusual trends in transaction data and thus preventing fraud (Khan et al., 2024). To automate the talent acquisition process, AI tools are being used in HR to identify the relevant resumes, evaluate the suitability of candidates for jobs and even forecast employee retention (Alamu, 2025). The latter makes the work of HR departments more informed when it comes to making hiring decisions, thus enhancing the quality of their workforce and its performance.

Furthermore, Basit et al. (2025) examined how AI technology affects firms' service innovation performance and found that AI significantly strengthens innovation outcomes when combined with cooperative R&D activities. Their findings demonstrate that AI acts as a moderating capability, amplifying the impact of inter-firm collaboration on service development and competitiveness. This reinforces the argument that AI not only optimises operational decisions but also reshapes value-creation processes through service innovation.

Although it has numerous advantages, the use of AI in decision-making has quite a number of pitfalls and challenges. Among these are the ethical consequences in the case of AI-based decisions. Under the influence of such unstructured norms, the AI algorithms can result in the perpetuation of inequality unintentionally, particularly when the model is provided with historical data exemplifying such inequalities. A good example is that during the hiring process, biased data could be used in hiring algorithms to discriminate against a group of people, marring diversity and equity (Amola, 2025). Moreover, organisations need to tackle the problem of AI decision-making transparency as customers and even employees need to realise how AI models come to their conclusions (Floridi & Cowls, 2019). Excessive usage of AI is another problem that can result in under-supervision by humans. AI may be a helpful source of advice, but it does not consider the complete domain of human experience and gut feelings. Excessive use of AI might lead to the technical accuracy of decisions, but not put them in perspective, which would lead to unforeseen consequences (Schmitt, 2023). Additionally, the costs associated with infrastructure and staff training needed to incorporate AI in the corporate processes can be prohibitive, especially for smaller companies (Schwaeke et al., 2025).

### **3. AI and Organizational Change Management**

Change management has been revolutionised with Artificial Intelligence (AI), or how companies have handled change as a result of the rooted innuendo of AI in organisational mechanisms. Companies are now being subjected to more vibrant and challenging business contexts than ever before, and AI has the potential to offer the preferred instruments to make the decision-making process simple, grow efficiencies to the highest levels and create an environment of continuous re-invention. However, the actualisation of AI in organisational change management does not form a smooth pick. This section explores the complexity in application and management of AI in initiating and managing organisational change, the exact role it occupies in leadership, and the limitations of successful adaptation of AI.

#### **3.1 Introduction to Organizational Change Management (OCM)**

Organisational Change Management (OCM) is an organised manner of achieving organisational changes that successfully administer in change-related initiatives, such as those based on technology, process improvements, or cultural change. This field seeks to reduce resistance, counteract risk and make sure that both humans and organisations as a whole are able to adjust and accept change (Schmitt, 2023). In this modern, dynamic business world, organisations should be dynamic, sensitive and prepared to meet the internal and external demands. The fast-growing technology, the usage of artificial intelligence (AI), has significantly contributed to supporting organisational changes. AI tools can provide insight, automate tasks, and even offer projections into the future to organisations and allow them to make informed decisions on the kinds of changes they should make (Al-Surmi et al., 2021). The reasons as to why change is necessitated can be due to increased competition, market demands, technological advancement or change in organisational goals. The use of AI in this transition cannot be overestimated since it gives organisations a new toolkit that simplifies processes in change management, and the results will eventually become better (Chatterjee et al., 2023).

#### **3.2 The Role of AI in Facilitating Organizational Change**

The life-changing effects of AI to help organisations embrace change are its capabilities of enhancing efficiency, together with decision-making and innovation culture. One of the greatest contributions that AI has made towards organisational change is streamlining business processes. Automation aided by AI can be employed to reduce the time and investment that could be consumed in the bid to implement routine processes, such as input

of information, scheduling, and customer care (Alenezi & Akour, 2025). Companies may use AI tools to increase internal efficiency and customer service to a much greater extent and reduce the need for human resources to devote them to other important tasks (Al-Surmi et al., 2021).

Besides, AI can enhance the degree of organisational agility by making decisions that are more responsive and agile. Real-time applications Analytics provided by AI can analyse massive data and extrapolate on trends and insights that would otherwise have been hidden. This information can be used in decision-making by the leaders and as a means to respond more promptly to market or internal process changes (Bandara & Malalage, 2025). As an example, the implementation of AI can assist leaders in finding inefficiencies or bottlenecks in their work processes and offer changes that can help organisations to adopt new strategies and processes (Maiti et al., 2025).

Corporate culture as well as management systems are also changing because of the incorporation of AI. The personalised practice of management can be supported with AI instruments because the analysis of employee performance, communication patterns, and engagement can be carried out. These instruments help leaders to get to know the demands of the workforce more and implement more specific change strategies (Atienza-Barba et al., 2024). As an illustration of it, AI can be used to determine how employees would receive organisational changes, and leaders can use this information to shape the communication strategies, communicating the employee concerns before they get out of hand (Chhatre & Singh, 2024).

Moreover, AI has a central role in overcoming the resistance to change. The need to change the organisation is usually a major stumbling block to effective change. Sentiment analysis and other AI tools can be used to identify the concerns and motivations of employees so that leaders can do so in advance (Yilmaz & Yilmaz, 2023). AI has the potential to offer significant insights on the emotional atmosphere within an organisation by constantly assessing the mood of employees so that the leadership team would know how to intervene without letting defiance set in deeper (Gaitantzi & Kazanidis, 2025).

The efficiency of AI applications in organisational change can be exemplified by multiple case studies. In the banking industry, AI-based regulatory technologies (RegTech) have simplified the regulatory procedures, saving time in filling paperwork and audits. This has not only enhanced efficiency in operations but has also enabled the organisation to redirect resources to other, more strategic operations (Abdellatif, 2025). The same goes for the healthcare industry, where decision-making systems powered by AI have been able to enhance patient outcomes through the ability to predict disease patterns and the subsequent optimisation of treatment regimes (Mudgal et al., 2022). The above illustrations highlight how powerful AI can be, as it can transform industries and manage change in a manner that has hitherto not been possible.

### **3.3 Impact on Leadership, Communication, and Employee Engagement**

Inclusion of AI into the workplace has significant ramifications on leadership, communication and engagement with employees. There is also a transformation of the traditional type of leadership wherein leaders can now use data-driven solutions to make better-informed decisions (Alamu, 2025). Artificial intelligence (AI), by providing better analytics tools capable of detecting and analysing patterns, forecasting, and streamlining decision-making, assists the leaders (Zein, 2025). This transition to data-driven leadership has meant that executives need to be AI-literate and knowledgeable about the uses of AI because their ability to make decisions is now dependent on the information coming out of AI. Consequently, AI is driving an authoritative leadership to a more collaborative

and evidence-based approach that derives its decisions based on evidence rather than on intuition (BaniHani et al., 2024).

Further, AI is important in changing organisational communication. Chatbots, automated emails, and other AI-powered communication tools facilitate communication between departments, teams, and employees, thus making the work more streamlined. This would make sure that all are in alignment with the organisation's goals and objectives, leading to overall better productivity (Gocen & Aydemir, 2020). Also, the tools utilising AI enable real-time communication, immediate feedback and problem-solving. This brings about a transparent and open communication culture that is necessary in change management (Schwaeke et al., 2025).

As far as employee engagement is concerned, AI can be used to improve how organisations gather and assess employee feedback. Sentiment analysis solutions based on AI capabilities will be able to understand employee morale, spot areas of discontent, and prescribe practical measures to rectify the situation (Ferdiana, 2024). AI allows leaders to know when to intervene or deal with concerns before they become very critical, given that it tracks employee sentiment in real-time. It is particularly crucial when there is a change in the organisation since workers might be confused about their future job in the company. Through AI solutions that would screen these issues, companies can create a more enthusiastic and productive workforce (Meng et al., 2025).

Besides, AI technologies are going to assist in regulating an AI-enhanced workforce. By automating simple tasks, employees will have more time to work on more interesting and strategic areas of the business (Zviel-Girshin, 2024). The change of roles also necessitates different types of leadership and associated communication to help the employees feel engaged and supported in their new roles. AI can play a role in this process since it can be used to offer individualised learning and growth opportunities that would empower employees to succeed in an environment where AI is introduced (Yilmaz & Yilmaz, 2023).

### **3.4 Challenges and Barriers in Implementing AI for Change Management**

AI has numerous advantages in organisational change management, without denying that there are challenges associated with it. Cultural resistance is one of the major obstacles. Most employees might not take AI positively because they might fear losing their jobs, particularly when they believe that the use of AI will substitute their positions (Ateeq et al., 2025). It is important to overcome this resistance through a multifaceted strategy involving staff education on the benefits of AI and AI transparency on how it will be implemented to enhance, but does not substitute, the work done by the staff (Rajuroy & Mary, 2025). Also, the leaders should express the positive effects of AI on their career development, including the chance they will get to upskill and advance in their profession.

The other major problem is that the workforce lacks the skills to co-work with the AI technologies. Implementing AI can mean your employees need to pick up a new set of tools and systems, and this can discourage non-technical people. To eliminate this skills gap, organisations need to invest in training and development initiatives that would provide employees with the requisite skills on AI (Lepp & Kaimre, 2025). Such an omission might spell frustration and disengagement, which will not help the change management initiative overall (Alenezi & Akour, 2025).

Lastly, ethics enters the picture regarding using AI in change management. The downsides to the AI being used in decision-making include possible bias, privacy concerns, and accountability. But as good as AI systems can be trained, they can only be as good as the data upon which they have been trained, and when those are biased in some ways, the chances of the resulting decisions are going to reproduce those same biases (Haleem et al., 2022). Organisations need to have strong governance systems that provide transparency, fairness, and accountability in AI applications to ensure that it is adopted in an ethical way (Mittelstadt et al., 2016).

#### **4. Ethical Considerations of AI in Business Strategy**

The incorporation of Artificial Intelligence (AI) in business strategy has opened a new front regarding the opportunities; however, at the same time, it has introduced substantial ethical issues that must be considered carefully. Introduction of AI into decision-making operations has drastic impacts which will not only affect the efficiency in operations, but also privacy, fairness, transparency and accountability. The ethical expectations about AI in business play a major role in making sure the use of AI in business brings the kind of value that a business and society need and reduces the chances of creating any form of damage (Amola, 2025). The moral issues of AI usage imply that companies have to implement responsible AI practices by both the regulatory demands and social norms. However, this critical analysis covers the main ethical issues that companies need to consider when implementing AI into their policy, especially privacy and data security, bias and fairness within the AI algorithm and the necessity of transparency, accountability, and responsibility.

##### **4.1 Privacy and Data Security:**

Highly data-demanding AI systems typically entail potentially sensitive information about the individual. The use of big data presents major privacy issues because companies are collecting, storing and processing this data with a plethora of agendas, such as customised marketing and decision making. The first ethical concern is that data that belongs to consumers should be safeguarded, especially regarding the security of privacy laws and regulations, including the General Data Protection Regulation (GDPR) in the EU and the California Consumer Privacy Act (CCPA) in the United States (Abdulrahim et al., 2025). These regulations require organisations to gather and utilise personal data based on informed consent, and offer transparency of the data collection procedures and the right of consumers to access and eliminate their data. Failure to comply may cause enormous fines and reputational loss of business.

Data misuse and unintended consequences due to the data analyses of the AI are also a cause of concern. To give some examples, when trained on biased or even incomplete data, AI systems can reinforce or potentially exacerbate what already exists in terms of inequality (Akcapinar & Sidan, 2024). Moreover, the ability of AI to predict may unintentionally infringe the privacy of people, allowing the revealing of some secrets that no one wanted to share. Companies should implement rigorous data protection strategies against unauthorised access, data breaches, and malicious attacks. Using privacy-by-design and hiding data from consumers will reduce these risks and allow building up consumer trust (Fan et al., 2025).

Additionally, the ethical principles on the subject of data security apply to the responsible application of artificial intelligence in business intelligence. The companies that apply AI to facilitate their business process, such as customer relations management or fraud alerting, need to make sure that AI algorithms are not utilised in a manner that would undermine consumer confidence. The workings of the AI systems must often be audited to

determine their conformity with the data protection laws and to see whether they are operating as expected (Sarker, 2022).

#### **4.2 Bias and Fairness in AI Algorithms:**

The possibility of algorithmic bias is one of the most critical ethical issues about AI in businesses. AI systems are no more accurate than the information they have been trained on, and when it comes to biased data, any trained AI will reproduce and increase its biases in its estimations and decisions (Tsamados et al., 2021). Biased AI models used in business will cause discrimination, e.g., through unfair personnel recruitment, biased credit scoring or pricing models that disadvantage a specific population group.

It has been found that discrimination in AI has far-reaching business implications. As one such example, biased recommendation systems in the retail sector can lead to particular groups of customers not getting a personalised offer or product suggestions, and this can negatively affect the sales process of any firm (Ak& Twisted, 2024). In the same way, biased algorithms can discriminate against job applicants based on gender or ethnicity, leading to workplace disparity (Alamu, 2025). Consequently, businesses have to deal with bias in AI by ensuring their data is representative, diverse, and inclusive. Other techniques, such as fairness-aware machine learning and adversarial debiasing, can be used to reduce algorithmic bias and make outcomes more fair (BaniHani et al., 2024).

Moreover, companies need to make efforts to adopt mechanisms that will enhance equity in AI decisions. It is important to make the models and data behind AI decisions transparent, and by doing so, enable bias to be detected and corrected within the organisation (Maiti et al., 2025). The possible solution is to form an interdisciplinary team including technical professionals and social scientists, to conduct an evaluation and audit of AI systems on fairness on a regular basis. Also, consumer advocacy groups and regulatory agencies are external stakeholders that can be included in the evaluation of businesses to make them answerable to their AI practices (Koufi et al., 2024).

#### **4.3 Transparency, Accountability, and Responsibility:**

When it comes to the question of accountability, this falls to the forefront as AI moves into mainstream business decision-making. When AI makes inaccurate or detrimental decisions, who has to take the blame? Such a question is especially complicated when it involves the obscure mechanism of making decisions on the part of AI that is hard to interpret by human beings, commonly referred to as the black-box problem of AI (Mittelstadt et al., 2016). AI processes need to be transparent so that business leaders can get to know how the decisions that affect their business are being made.

An explanation of AI transparency can be performed by the interpretability of AI, that is, the ability of stakeholders to understand how the decision was made, and what conditions contributed to the outcome influence (Schwaeke et al., 2025). Transparency can also apply to make known how consumers are being surveyed in the use of ready systems of AI, encouraging them to exit or challenge AI-made decisions. Such transparency plays a very important role in the sustenance of consumer trust, and in whether businesses can meet ethical standards. In addition, companies should not oversell the potential of AI and disclose its inabilities (Alenezi & Akour, 2025).

Another important issue is accountability in the making of AI decisions. Businesses should develop hierarchies of responsibility when it comes to AI-based decision-making, and the element of human supervision must be suggested at all times, particularly in domains where stressful consequences are likely to occur, including healthcare, finance, and policing (Sison et al., 2023). Guidelines on trustworthy AI created by the Ethics Board of the EU include measures that suggest that AI systems must include human-in-the-loop mechanisms to avoid decisions being taken only by AI without appropriate oversight. The businesses also need to develop systems of accountability that will allow any AI decision to be correlated by the accountable members of the business.

Lastly, the incorporation of AI into the business strategy should be informed by morals. An increasing number of companies are creating AI ethics guidelines in order to create definite ethical standards in AI development and use. These principles stress human dignity, fairness and AI systems, as well as transparency. Specifically, companies should make sure that AI-based strategies are aligned with corporate social responsibility (CSR) goals, so these strategies are not aimed solely at profiting but also at the welfare of the larger society (Bankins & Formosa, 2023). In addition, businesses should take into consideration the nature in which AI systems they develop could affect society, particularly disruption to the labour market, invasion of privacy and encouraging inequality.

## **5. The Effect of AI in Education and Programming Skills Development**

Artificial Intelligence (AI) has emerged as a disruptive technology in learning as it has changed the traditional course of knowledge delivery and significantly transformed the teaching and learning of skills in programming. Implementation of AI in the sphere of educational tools and platforms provided opportunities in the sphere of personalised learning, adaptive education technologies, and training of companies. With the evolution of AI-based platforms, their usage is gaining increasing popularity to facilitate teaching and learning processes in such technical disciplines as programming and other aspects, which implies providing students with new ways to advance their skills. Nevertheless, although the range of potential benefits of AI is very high, there are also many concerns to address along the way, such as access, cost, and ethical issues. This critical essay will examine the educational impacts associated with AI, especially regarding the advancement of skills in programming, based on a review of the existing research and a pertinent case study.

### **5.1 AI in Educational Tools and Platforms:**

Artificial intelligence in education is transforming the education system as it offers individualised learning. AI-driven personalised education modifies content to meet the needs of a specific learner; this can aid in maximising the engagement level and learning success. Bhutoria (2022) identifies that AI-based technologies may be used to modify the lessons in accordance with the achievements and diagnose the weaknesses and strengths of the student, modifying the pace of the learning process. Such platforms, as Coursera or edX, where AI is utilised in choosing the courses according to the preferences of the learner and his/her learning patterns, are the way AI engages the learner in a more productive experience. AI algorithms within such platforms are used to provide customised content tailored to the personal learning styles, therefore, raising the probabilities of success (Adewale et al., 2024).

Besides that, AI has turned out to be extremely significant in corporate training, so organisations can deliver on-demand learning solutions to the workforce, especially in the sector where it is necessary to upgrade skills in real time. As an example, with the help of AI, one can evaluate the set of skills that an employee has and develop

specific training modules tailored to his or her developmental needs. The adoption of this type of adaptive learning platform by companies like IBM and Google to maximise the capabilities of the workforce, including those in similar technical areas like programming or data science, is also on the rise (Al-Surmi et al., 2021).

Chatbots based on AI are another example of a tremendous breakthrough in one-on-one learning support. The systems enable them to give immediate feedback and respond to the students, which almost reproduces the one-to-one learning process. It has been demonstrated that AI tutors have been effective, especially in STEM subjects, which are complex and necessitate repetition and practice (Ak Capinar & Sidan, 2024). The emergence of AI tutors has been accompanied by the overall pattern of self-directed learning that would let students learn the material at their own pace, without being focused on formal classroom study (Ali et al., 2023).

### **5.2 AI in Programming Skill Development:**

The effects of AI are particularly evident in the field of programming education, where it can assist both novice and experienced learners. Coding platforms, including GitHub Copilot and Replit tools, are some of the AI-powered tools that help learners write code more efficiently. GitHub Copilot, for example, employs machine learning algorithms to propose lines of code segments based on what the user types into the text editor, which vastly minimises the time taken to finish any programming task (Fan et al., 2025). The platforms also have the added benefit of benefiting novice programmers, since they may assist them in filling the gap between theory and practice.

Moreover, AI also improves the educational process in programming, where less experience will help students learn (by comparing programming mistakes by students, with the use of AI), which makes programming errors even more efficient. This is a direct feedback system which has been proven to enhance the art of programming since students are able to receive their errors before they get to practising and therefore avoid the reinforcement process when the wrong code habits are adopted (Yim & Su, 2024). Not only do such platforms offer technical support as Lepp and Kaimre (2025) claim, but they also enable one to conquer the fear that is also common amongst amateurs, the fear of programming. The role of AI in overcoming this barrier is similar to the conclusions reached by Yilmaz and Yilmaz (2023), according to whom AI tools increased the motivation and self-efficacy of the students in programming.

AI is also changing the nature of the skills needed in the tech industry. The increasing application of AI to certain areas of programming also indicates that programmers of the future will require not only coding abilities, but also knowledge of AI models, machine learning algorithms and data analytics as well. Alenezi and Akour (2025) note that AI is promoting the development of a transition towards AI fluency in technical training, which necessitates learning how to exploit AI instruments in resolving intricate interests and innovative techniques. With the current development of AI tools, the tech sector will need a new wave of employees who will not only be proficient in programming but also understand how to incorporate AI into their work to automate processes and bring out innovations (BaniHani et al., 2024).

### **5.3 Challenges in AI-Based Education and Skill Development:**

AI has a lot of benefits in education and programming skill building, but also has a number of setbacks. Access is one of the greatest hindrances to AI-based education. The use of tools in AI can be quite expensive, and learners in developing countries or low-income backgrounds may lack the proper resources to utilise this technology.

According to Kamalov et al. (2023), the use of AI-based educational infrastructures could make the problem of educational inequality even more acute since students without access to such systems will be at a disadvantage.

The other challenge is the digital literacy of the teachers and students. A large number of teachers might not be sufficiently prepared to incorporate AI tools into their teaching methods, and learners might lack the basic digital knowledge necessary to operate in such technologies adequately. Alamu (2025) points out that the introduction of AI into education poses the need to train and assist teachers extensively as they will not only have to learn how to employ these tools as an intimate supplement to teaching but also as a precise evaluator of student performance and the ability to deliver individualised feedback.

Another challenge that is important in the application of AI in education is ethical considerations. The feature which is concerning about the AI-based systems, like personalised learning tools and AI tutors, is their data privacy and the possible occurrence of algorithmic biases. Investigations such as those by Jose et al. (2025) and Schmitt (2023) show that AI systems can reproduce human prejudices by continuing them in their systems, particularly when trained using information that perpetuates past injustice. To take an example, the performance of an AI tutor could be less acceptable when offered to students with underrepresented backgrounds, given that training data is not prepared to take into consideration cultural or linguistic diversity. The use of ethical guidelines is needed to ensure that the course of AI is fair, transparent and inclusive and serves students equally.

## **6. Conclusion**

### **6.1 Summary of Key Points:**

The adoption of AI in education tools and platforms has brought about tremendous changes in individual learning, where AI has the capability of monitoring personalised learning patterns using its systems to adapt information delivery. Artificial Intelligence applied to such platforms as Coursera and edX can make their recommendations customizable to the needs of a learner, making their education more personalised. Besides, tutoring systems through the use of AI are using chatbots to offer immediate feedback and assistance that closes the gap between classroom-based education and self-learning. It is especially transformative in technical areas such as programming, where AI-based services like GitHub Copilot and Replit help newcomers to code, code suggestions and corrections in real time. Such platforms increase efficiency and quality learning by providing faster feedback that motivates the learners and helps them overcome the usability barriers of learning programming through the development of coding anxiety.

The role of AI in programming education is versatile because it affects areas beyond learning habits, such as competencies in the technology field. With more corporations implementing AI in their operations, the need for programmers to be AI-fluent rises, and it entails an awareness of AI models and the application of AI-facilitated tools to address complex issues. In addition, AI tools allow for an overview of the Tan Processing Task with less cognitive load of writing complicated code, thus providing learners with more time to perform higher-order thinking and problem-solving. Such a transition not only favours personal learning outcomes but also aligns with the transforming industry expectations that employers want a workforce that is technically advanced and has AI knowledge.

Nevertheless, even taking into consideration these innovations, the integration of AI into the educational process faces some issues. Affordability of AI tools is one of the main issues here; tools might be so costly, especially in

developing areas. This lack of accessibility has the potential to increase inequality in education, and a student with a disadvantaged background is unlikely to enjoy the support of an AI-enhanced learning tool. Furthermore, educational use of AI demands that the teacher possess adequate training on the effective use of modern technologies, which might lack the required infrastructure and resources in various educational systems at this point. AI integration in learning environments is further compounded by the digital literacy gap between students and educators, who are not equipped to use the AI systems.

Ethical issues are also of great concern regarding the uses of AI-based education, especially in data privacy, algorithmic biases, and AI system transparency. Due to the growing quantity of data about the performance of the students that is gathered and processed by AI tools, data misuse or breach is increasingly possible. In addition, without being thoughtfully constructed, AI algorithms can reinforce existing biases, which can result in the less fortunate groups being disadvantaged by inequitable learning outcomes. That is why moral fairness is essential when developing AI-empowered teaching products. To eliminate these risks, transparency, fairness, and accountability of AI systems are paramount to ensure.

### **6.2 Future Research Areas:**

Further improvements regarding the use of AI in education and the development of programming skills could be made by covering some essential topics in the course of future research. First, research must be conducted on the importance of the long-term effects of AI on learning outcomes, especially in technical areas. The impact of AI tools on student retention levels, ability to grasp challenging concepts, and general academic performance, and their effect on careers in the tech sector, in general, could also be studied.

Also, a research study should be conducted to consider how AI can be used to facilitate lifelong learning. Therefore, as the field of AI develops, professionals will increasingly have to improve their skills to keep up. Research seeking to understand how lifelong learning using AI can be applied by individuals and organisations will be vital to enable the employment industry to be weak and competitive due to the high rate of technological innovations.

Lastly, it is necessary to conduct future studies that will assess how to increase the accessibility and inclusivity of AI in education. This incorporates the exploration of the possibility of modifying the AI-based tools to varying cultural and language contexts, so that the AI-based learning apparatus is of value to students with various backgrounds. Researchers ought to also examine ways of ensuring that the AI techniques are affordable to every learner regardless of their socioeconomic status.

### **6.3 Practical Recommendations:**

In this research, a number of recommendations can be put forward based on its findings. The use of AI needs to be morally fit and implemented in educational institutions that can demonstrate transparency, impartiality, and privacy. It is recommended that policy-makers develop policies that would consider variations in the ethical consequences of AI in education and develop policies to allow equitable access to tools in AI. Companies ought to take the initiative of training their staff on how to use AI-driven tools to become more adaptive and cultivate a culture of lifelong employee learning. Lastly, the topic of AI and its long-term effects on learning achievements and the acquisition of skills and abilities should gain closer attention in the future, to precondition everyone to view AI as a shift towards changing education and other fields in a positive way only.

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