SOCIAL SCIENCE REVIEW ARCHIVES
ISSN Online: 3006-4708
ISSN Print: 3006-4694
https://policyjournalofms.com

Navigating the New Normal: How Artificial Intelligence Can Enable Business Resilience and Sustainability in a Post-Pandemic World

Muhammad Ihtisham[1], Aliza Tabassam[2], Shoket Ali[3], Iqra Bilal[4]

[1] School of Enterprise Management, Wuhan Institute of Technology.khanzeepieces97@gmail.com
[2] Allama Iqbal Open University alizatabassum@gmail.com
[3] Shah Abdul Latif University Khairpur shaukatalimalik@gmail.com
[4] The Islamia University of Bahawalpur iqrabilal23@gmail.com

DOI: https://doi.org/10.70670/sra.v3i1.511

Abstract

The current outbreak of the COVID-19 virus has drastically affected all business operations across the globe, hence forcing them to adapt to a new way of doing things through digitalization. AI is considered a game-changing technology this time when it attempts to help businesses improvisational effectiveness, supply chain and workforce response to risks and opportunities, and tackle environmental challenges. The following paper discusses how AI can help organizations be more adaptable to the conditions that emerged in the post-pandemic period for business, including the possibilities regarding predictive analyses, automation, and decision-making. Also, it discusses the ethical implications of AI, disparate impacts, data privacy concerns, and, last but not least, the impact on workforce displacement. The paper also presents the key recommendations to organizations on implementing AI, focusing on ethical AI management and preparing the workforce for adopting AI technology and shared AI adoption. Thus, AI is anticipated to bring many new growth opportunities owing to its interaction with other contemporary technologies like blockchain and IoT. To that end, this research informs the existing literature on digital transformation by providing potential recommendations for businesses operating in the realized new normal and seeking guidance on how to work with AI systems.

Introduction

COVID-19 has played a significant role in increasing the adoption of artificial intelligence since the pandemic impacted almost all the sectors of a country. Companies had to deal with new risks that called for quick accommodation of change to maintain their operations and sustainability. AI has become an essential compass for managing these disruptions and assists firms in enhancing organizational effectiveness and the effectiveness of invested resources to provide a sustainable structure for future growth (Bouncken, Kraus & Roig-Tierno, 2019). AI integration is revolutionizing the business world in terms of its strategic approach, decision-making process, and the way businesses interact with customers, which, in effect, creates a new model of digital business transactions in the new normal (Chang, 2022). Artificial intelligence has benefited business resilience due to various key provisions, including data analytics, automation and modeling. Such technologies have helped businesses/vendors lower risks, optimize processes, and address variability in market needs. The entrepreneurial ecosystem has also undergone tremendous change, and the help of AI, in this case, increases the rate of innovation and competitive advantage and gives way to establishing new business models (Behera, Dash, Mohanty, & Das, 2019). With numerous enterprises' constantly increasing artificial intelligence-driven

digitalization, smart technologies have emerged as an important factor that drives future growth and profitability. Nevertheless, there are concerns associated with the incorporation of AI, such as ethics issues, the threat of displacement of workers, and cybersecurity threats that organizations should manage properly to take full advantage of AI (Das, 2021a). This social reconciliation has changed business communication and consumer interactions due to the effects of the pandemic on digitalization. Mobile devices have allowed customers to embrace chatbots, virtual assistants, and automated customer service facilities, escalating customer response and experience (Chang, 2022). In digital banking and financial services, AI realigns risks and fraudsters and plans financial aspects while improving efficiency and customer trust (Das, 2020b). Likewise, AI has a transformative influence in digital marketing, where its support in big data analytics and machine learning algorithms boosts the efficiency of advertising, SEO, and brand positioning (Das, 2021b). However, businesses face several challenges if AI has to become a widespread technology, which is as follows. Issues concerning the application of decision ethics, including data privacy, algorithmic bias, and transparency, still constitute some of the significant challenges in using AI (Das, Mondal, & Sandhu, 2022a). However, the concerns around the existence of a digital divide, especially where accessibility is concerned, are some of the challenges SMEs face in exploiting the full potential of AI technologies (Das et al., 2022b). It is indispensable for organizations to adopt the principles of ethical AI, the direction of efforts on the improvement of AI skills among the employees, and the proper AI governance to make the AI integration more responsible and to provide equal opportunities to attain the benefits of the further technological progress (Duman & Das, 2021).

2. The Role of AI in Business Resilience

2.1 Supply Chain Optimization

Supply chain prediction and machine learning are the use of predictive analytics that can help businesses predict disruptions in the supply chain when there is a need for inventory and ways of making logistics better. Examples of such organizations include Amazon and Walmart, where the patterns of demand change have been predicted through AI, and warehousing processes have been automated to allow the supply chain to flow easily (Nitsche & Straube, 2021). The emergence of the new normal required, flexible supply chain operations, so organizations resorted to Artificial Intelligence to analyze the market situation (Ngoc-Vinh, Tien-Dung, & Das, 2022). Also, due to AI, organizations have identified threats that may occur before they do to avoid extended downtimes with a resultant need to minimize losses (Minh-Nhat, Majerova, & Das, 2022a).

2.2 Workforce Management

This is because AI-assisted means can help manage and adapt remote work, keep track of the workforce schedules, and improve employees' well-being. Through the process of survey results, we can conclude that chatbots, virtual assistants, and other applications of artificial intelligence in the Human Resources department enhance communication, automate several tasks, and provide valuable data regarding the productivity and engagement of the employees (Mondal, Virgilio, & Das, 2022). Hence, based on the experiences that organizations have gained in the context of the new normal, AI has become vital for workforce productivity and flexible work management (Nguyen, Mondal, & Das, 2022). Workforce computing solutions help the HR department decide on hiring new talent, performance evaluations, and the management of engagement across disciplined working environments for continuous productivity in modern work engagements (Mondal & Das, 2021).

2.3 Customer Experience Improvement

AI-driven chatbots, AI-based recommendations, and customer sentiment analysis improve customer experience. Organizations that employ AI provide organizations with real-time customer data on potential issues, marketing, and customer relations, thus addressing the issues before they occur (Minh-Nhat, Nguyen, & Mondal, 2022b). With the arrival of the new normal, there are changes in the model

of consumer behavior, which needs the use of artificial intelligence to enhance customer engagement and retain consumers (Jain et al., 2018). AI has also been a driving force of hyper-personalization since it allows organizations to design consumer interactions based on consumer information, improving satisfaction and customization rates (Das, 2021c).

2.4 Ethical Considerations and AI Governance

Despite the numerous benefits of AI, there are several limitations that a firm has to consider before adopting AI. That is, issues concerning the ethical use of the technology and its appropriate applicability remained contentious, including with respect to data privacy, bias in identifier algorithms, and the level of transparency, among others (Das, Mondal & Sandhu, 2022a). Secondly, digital inaccessibility also remains the main problem of the digital divide that impacts SMEs in adopting AI (Das et al., 2022b). In other words, solving the problems of AI requires people to receive proper education and training for utilizing these technologies, establish suitable ethical guidelines in organizations, and have equal access to AI systems (Duman & Das, 2021). So, it is crucial to assist enterprises in inventing ethical rules since they address the requirements for business compliance and uphold fairness in the decision-making process of AI (Mohanty, Dash, Dash & Das, 2019).

2.5 Future Prospects of AI in Business Resilience:

As such, AI has great potential and yet is challenging in the context of business resilience. Pagination, generative AI, and other advanced technologies will keep changing industries, economic systems, and layouts further. However, regulatory framework, cybersecurity, and over-dependence on the human workforce challenge businesses to maintain their AI growth (Das, 2021c). Also, AI will improve business sustainability through NLP, better, deeper learning, and automation to advance business model sophistication and flexibility (Nguyen, Tien-Dung, & Das, 2022). The connection of AI with growth technologies such as blockchain and the Internet of Things (IoT) will enhance security, data sharing, and business performance or process enhancement (Lim, 2021). AI is now the parsing factor of business continuity in the new normal, empowering organizations to manage supply chains, people, and customers and speak out on ethical issues. It is crucial to note that digital transformation today is rapidly progressing, and it is obligatory for any organization to develop and implement AI systems for the organization's further evolution and development. Hence, it becomes important for organizations to adopt the solutions offered by Artificial Intelligence while maintaining the best ethical use standards. Future studies in the case of AI should focus on the repercussions that the business faces in the future, particularly concerning innovation adoption and sustainable business models to boost global competitiveness.

3. AI for Sustainability in the Post-Pandemic World

The post-pandemic perspective has influenced the integration of AI into a regular process in organizations and industries, making the approaches to sustainability different. While operating in the context of the deteriorating environment, social reference and governance, organizations only focus on implementing advanced technology to bolster, particularly, Artificial Intelligence holds a unique position in successfully attaining the goals of ESG by mainly focusing on the maximum utilization of resources, duly the avoidance of the wastage of resources. This paper highlights the three main areas where the impact of AI on sustainability is most noticeable: energy management and saving, the minimization of waste and development of circular economy practices, and applied improvement of health care and safety.

3.1 Energy Efficiency and Carbon Footprint Reduction

AI is responsible for making smart grids efficient in terms of energy consumption and carbon emission rates. Renewable energy sources pose a problem to traditional energy grids because they do not generate power at certain periods. Advanced smart grids employ artificial intelligence and machine learning to

predict energy usage and generate adaptive electricity supply and distribution patterns (Bhatia and Kumar, 2022). This way, these grids lessen wastage and complexity while matching demand and supply and simultaneously minimizing the use of fossil fuels. For example, optimizing energy utilization is implemented by applying artificial intelligence-based predictive maintenance in power plants and industrial facilities. The algorithms' real-time analysis of the equipment data helps to identify the pattern of failure and even predict failure before it happens. This also helps boost operational productivity, simultaneously decreasing the greenhouse effect exerted by energy-intensive industries (Alzamora-Ruiz et al., 2021). The application of AI in energy management is valuable for the manufacturing sector in a particular way. AI technology is used in factories to regulate operations, minimize time wastage and cut energy wastage. Smart sensors and IoT devices collect massive amounts of data from the environment and from organizations' decisions, which allows an AI system to suggest energy-efficient measures, such as turning off unnecessary machines and optimizing heating, ventilation, and air conditioning (HVAC) systems (Ardito et al., 2019). Likewise, using artificial intelligence in data centers results in considerable energy efficiency improvements. This portrays that the centers responsible for cloud computing and storing data consume much energy. AI then adapts cooling systems, makes predictions of workloads, and allot computing resources to lower energy consumption (Treiblmaier & Tumasjan, 2022). It is worth noting that several corporations, including Google and Microsoft, have also applied AI to manage cooling systems that can save more than 30% of overall energy consumption. AI applications in transport systems enhance ways of cutting the carbon footprint by managing the transport channel and encouraging consumers to shift to electric vehicles. The use of algorithms in machine learning permits the identification of traffic patterns, weather and vehicle data to determine efficacious routes for use by logistics industries (Tyagi et al., 2020). Mobile telematics, as a fleet management component, helps control performance, predict maintenance, and avoid extra fuel consumption on vehicles. In addition, it helps improve EV infrastructure by determining the locations and demand of charging stations and directing energy distribution. Smart charging systems use AI to control the charging of EVs during off-peak times, adjusting the load on the grids and promoting renewable energy sources (Mega, 2021).

3.2 Waste Reduction and Circular Economy

Artificial intelligence's application in waste management is changing how cities and companies deal with wastewater. Conventional waste collection practices cause several problems that may result in more disposal in landfills. AI waste sorting enables the segregation of recyclables with the help of computer vision and robotic models to enhance recycling efficiency and minimize contamination (Awan et al., 2021). For instance, the smart waste bins containing AI sensors as part of the system help monitor the waste and arrange the pickup in a way that does not allow for full bins. Machine learning results in accurate estimation of failures and thus prediction of future waste generation: this assists municipalities in mapping out better waste collection routes to minimize the garbage trucks' fuel consumption (Barney, 1991). This scenario depends on acute waste minimization or maximizing the time spans for use and reuse to its maximum needs. As a result, AI makes it possible for companies to promote sustainable resource usage and recycling within production lines. Predictive analytics also assists manufacturers in designing their products with assured durability and the capacity to be recycled; this enables the reduction of waste in the production phase (Blanche et al., 2019). Self-driving enables reverse transportation of products used to be returned, repaired, reused or recycled. For example, AI systems, in several ways, are used in evaluating the quality of returned electronics, such as whether they will be sold as they are if they will be repaired, or if they will be used for recycling, i.e., if we can get some valuable parts from them. This greatly helps minimize while championing sustainable use and/or consumption (Boitan and Stefoni, 2022).

3.3 Healthcare and Public Safety

Consumer-first technologies have evolved in numerous ways, significantly impacting healthcare and public safety by diagnosing prospective situations and diseases, inventing cures for diseases and illnesses, and establishing related monitoring systems. Artificial intelligence is used in the early identification of diseases, so the quality of patient care is increased, and the strain on the healthcare systems decreases (Tien-Dung et al., 2022a). There are extensive datasets to predict outbreaks and treatment plans and manage the healthcare facility and its functions through machine learning models (Siri & Das, 2021). Mobile monitoring systems enhance society's safety by identifying mobility trends and health hazards and enhancing the responding mechanisms (Van et al., 2020). AI has later played a crucial role in mapping the virus, preparing and distributing vaccines, and optimizing pandemics (Tien-Dung et al., 2022b). Not only that, but Telemedicine has also made healthcare more accessible to people, especially those in rural areas, through the utilization of Artificial Intelligence (Tiwari & Mondal, 2022). In public safety, AI-integrated surveillance helps in crime prevention, and on the other hand, in the police service, predictive policing increases efficiency in law enforcement (Treiblmaier & Tumasjan, 2022). AI further becomes more detailed in the healthcare and public safety sectors through the enhancement of medical services and the development and management of modern emergencies to enhance health and population safety outcomes.

4. Challenges of AI Adoption in Business

However, as more businesses look to implement AI into their operations, there are numerous risks related to the implementation of such technology for decision-making for an organization, some of which include: One of them is algorithmic bias – machine learning and artificial intelligence may produce results that are racially or sexually biased and can impact the decision of hiring, lending or even customer profiling (Brock, L. & von Wangheim, F. 2019). Safety assurance is one of the major concerns since AI deals with large volumes of exacting information, which may expose them to hacking and other forms of unauthorized breaches (Dauvergne, 2022). Further, it entails high costs regarding capacity, cloud services, and security(Akerkar, 2019). There are writing challenges due to the lack of skilled human capital, as many employees do not possess the necessary knowledge to work with AI. Training and development of the existing workforce should be scaled up because AI brings forth opportunities and the risks of displacing workers (Chalmers et al., 2021). The other source of concern is the traditional implementation of AI as part of the business model concerning ethics and regulation (Antoncic, 2020). Lack of appropriate governance over AI systems might result in a negative impact of the system on the operation, people and their privacy. Eradicating these challenges would be useful for businesses in determining optimum benefits from their AI investments while adhering to certain levels of business, legal, and societal standards in the long run.

5. **Strategic Recommendations for Businesses**

To harness AI for resilience and sustainability, organizations should:

- Develop a clear AI adoption strategy aligned with business objectives.
- Invest in AI talent and workforce training.
- Implement robust data governance and ethical AI frameworks.
- Foster collaboration with AI solution providers and regulatory bodies.
- Continuously monitor AI performance and iterate for improvements.

6. **Conclusion**

Regarding the changes in the post-pandemic period, AI is one of the most promising tools, allowing organizations to increase productivity, make better decisions, and improve customer satisfaction. Some

of the areas that it has proved useful in include predictive analysis, automation, as well as intelligent supply chain management, thus helping organizations develop some level of robustness and flexibility in a world that has gone digital and where data is now a major currency (Chalmers et al., 2021). Technological evolution, such as artificial intelligence assets in finance, healthcare and retail sectors, ensures cost efficiencies and effectiveness in service delivery for sustainable business development (Akerkar, 2019). However, there are some disadvantages to the use of AI, which are as follows: Ethical concerns, algorithmic biases, data privacy risks, and the need for significant investments in infrastructure and talent development pose hurdles to widespread implementation (Brock and von Wangheim, 2019; Dauvergne, 2022). Laws and regulations In the same regard, more proactive organizations shall be preferred by investing in AI governance, regulation, and training the workforce so that they can realize the benefits of AI with the few vices around. As a result, businesses need to embrace innovation and find ways to effectively implement new technologies to ensure the success of organizational strategies. For the executive summary, the following recommendations will be made: In the contemporary world, businesses that adopt AI will have an added advantage, achieve sustainable growth, and adapt to the fast-transforming digital environment, as highlighted by Cowls et al. (2023).

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