NAVIGATING THE FUTURE: ARTIFICIAL INTELLIGENCE'S GROWING INFLUENCE ON DECISION MAKING

Adel Ali Yassin Alzyoud

Assistant Professor. Business Administration department, Applied Science University, Kingdom of Bahrain. Email: adel.alzyoud@asu.edu.bh Orcid: https://orcid.org/0000-0002-3365-3337

Abstract: Purpose: The purpose of this study article is to investigate the impact of AI (system capability, user behavior, training and development, and expert availability) on decision making in Bahrain telecommunications company.

Theoretical framework: The deployment of AI systems has expanded tremendously in recent years, and decision making is no exception to its disruptive potential (Jones et al., 2022). AI algorithms and technologies are being used by organizations and individuals to assist and improve decision-making processes. To fully reap the benefits of AI, however, a thorough knowledge of the intricate interplay between AI and decision making is required.

Design/methodology/approach: In this study, a quantitative research design is utilized since it permits statistical tools to be used to assess the association between variables. This quantitative study's research approach will be cross-sectional, with the goal of examining the role of artificial intelligence (AI) in decision making. Data were collected by questionnaire from a sample of 195 employees from a Bahraini telecommunications company.

Findings: The results show that there was an association between all the artificial intelligence components and decision making. This finding is consistent with the previous studies, which claims that artificial intelligence lead to decision making (Prasanth, et al., 2023; Ferreira & Monteiro, 2021; Jarrahi, 2018).

Research, Practical & Social implications: The AI has .the potential to totally revolutionize the way organizations make decisions. However, in order to preserve customer confidence and prevent unforeseen repercussions, enterprises must use AI responsibly and transparently. The use of AI for decision-making, both for businesses and consumers, is undeniably the way of the future

Originality/value: The value of the study understanding the impact of AI on decision making is becoming increasingly crucial as the technology advances. AI system integration can improve decision-making abilities, increase efficiency, reduce risks, offer access to expert information, and raise ethical concerns and obstacles in organizations.

Keywords: Decision making, Artificial intelligence, System ability, User behavior, Training and development, Availability of experts, Kingdom of Bahrain.

1. INTRODUCTION

Decision-making is critical in various fields, ranging from business and healthcare to finance and government, in today's fast-paced and data-driven world. Decision-making has always been a complicated and difficult process, typically depending on human judgment and hampered by time restrictions, biases, and cognitive limitations (Ahmed et al., 2023). However, the introduction of Artificial Intelligence (AI) has created new opportunities for improving decision-making processes.

AI systems have gotten more complex as machine learning, natural language processing, and neural networks have advanced, allowing them to handle massive volumes of data, identify patterns, and provide insights at a rapid pace and accuracy far exceeding human capabilities (LeCun et al., 2015).

The expanding influence of AI in decision making has far-reaching ramifications for a wide range of industries, providing potential to streamline procedures, enhance efficiency, and produce better results. By delivering important insights, automating mundane processes, and allowing data-driven methods, AI has the ability to change decision-making procedures (Brynjolfsson & McAfee, 2014). Organizations that use artificial intelligence to make choices can obtain a competitive edge by making educated, timely, and optimal judgments (Reddy et al., 2023).

However, as AI becomes more common, it is critical to comprehend the consequences, problems, and limitations of its deployment. Some AI systems' black-box design and dependence on previous data raise issues about openness, fairness, and prejudice (Doshi-Velez & Kim, 2017). Furthermore, ethical concerns about the use of AI in decision making, such as privacy, security, and responsibility, must be addressed (Floridi et al., 2018).

This study attempts to give a thorough examination of the impact of AI on decision making (system capability, user behavior, training and development, and expert availability). This research will investigate the benefits, problems, and future possibilities of AI in decision making across many industries by reviewing real-world examples, case studies, and current literature. It will look at how AI is being used in industry, healthcare, finance, and government, emphasizing the potential for increased efficiency, accuracy, and strategic decision making.

Understanding the influence of artificial intelligence on decision making is critical for academics, practitioners, and policymakers alike. This study will add to the corpus of knowledge by offering insights on the potential advantages of AI, the ethical issues involved, and the implications for decision makers. It will also address issues about data quality, openness, and collaboration between people and AI systems (Khosravi et al., 2022).

Understanding the impact of AI on decision making is becoming increasingly crucial as the technology advances. AI system integration can improve decision-making abilities, increase efficiency, reduce risks, offer access to expert information, and raise ethical concerns and obstacles. Researchers and practitioners can navigate the complexities and responsibly leverage the benefits of AI technologies by investigating the influence of AI on decision making across various dimensions such as system ability, user behavior, training and development, and the availability of experts (Jones & Brown, 2021; Reddy et al., 2023).

This research intends to assist decision makers in maximizing the promise of AI while addressing its problems and guaranteeing responsible and ethical use by shining light on the role of AI in decision making. Finally, the goal of this research is to give direction for the future development and deployment of AI technologies, therefore contributing to the advancement of decision-making procedures in a variety of fields.

2. LITERATURE REVIEW

The impact of Artificial Intelligence (AI) on decision making has emerged as a significant issue of research and debate in a variety of academic domains. The purpose of this literature review is to give a thorough examination of existing research and scholarly publications that investigate the influence of AI on decision making. This research attempts to uncover major themes, ideas, advantages, problems, and future possibilities linked with the integration of AI in decision-making processes by evaluating and synthesizing relevant literature.

Numerous studies have emphasized the possible benefits and breakthroughs in decision making brought about by AI. AI systems can handle and analyze massive amounts of data, allowing businesses to extract important insights and patterns (Zamani et al., 2022). Machine learning algorithms enable automated data-driven decision making (Rábová, Konečný & Matiášová, 2005). Furthermore, AI systems provide real-time monitoring and predictive analytics, allowing businesses to make proactive, evidence-based decisions (Trunk, Birkel & Hartmann, 2020). AI has also enabled the customisation of decision support systems based on individual preferences and historical data (Haenlein & Kaplan, 2019). AI breakthroughs contribute to improved decision-making processes, resulting in better outcomes across several disciplines.

While AI has several benefits, it also has issues and limitations that must be addressed. One key source of worry is the possibility of biased decision making. AI systems are taught on historical data, which may be biased or represent existing societal disparities (Fast & Schroeder, 2020). AI systems, if not properly controlled, might perpetuate or exacerbate these biases, resulting in biased decision results. Fairness, transparency, and accountability in AI decision making are continuous challenges that must be addressed (Shrestha, Ben-Menahem & Von Krogh, 2019).

Another problem for AI systems is their interpretability and explainability. Deep learning models, in particular, frequently operate as black boxes, making understanding the underlying decision-making processes challenging (Agrawal, Gans & Goldfarb, 2018). The absence of interpretability undermines user trust in AI systems and creates difficulties in key decision-making situations. A crucial topic of AI research is finding a balance between accuracy and interpretability.

Furthermore, ethical issues surrounding AI in decision making demand close scrutiny. To ensure responsible and ethical usage of AI systems, issues such as privacy, security, and the possible influence on human autonomy must be addressed (Floridi et al., 2018). It is critical to strike a balance between using AI to assist human decision-making and retaining human control over decision-making processes.

Moving forward, various areas of research and development have the potential to define the future of AI in decision making. According to the findings of the study by Ferreira, & Monteiro (2021), AI explanations play a critical role in empowering humans to defend their actions. Participants indicated enhanced confidence in their judgments and a higher assessment of decision quality after being given explanations supplied by AI systems. Users were able to match their reasons with the AI's decision-making process thanks to the explanations, which helped them comprehend the underlying rationale and considerations considered by the AI. Another findings by Alufaisan, et al., (2021) revealed that providing XAI explanations influenced human decision-making positively. Participants who got explanations from the XAI system had higher decision accuracy than those who did not get explanations. Individuals were able to better grasp the reasons behind the AI's actions as a consequence of the explanations, resulting in more informed and effective decision-making.

Exploring forms of human-AI collaboration to utilize the skills of both entities is also critical. Augmented intelligence, in which AI systems give insights and recommendations to supplement human decision making, shows promise in terms of reaching optimal results (Brynjolfsson & McAfee, 2014). Effective human-AI cooperation models, decision support systems, and decision-making interfaces should be the focus of research.

Finally, the creation and implementation of ethical frameworks and rules for AI decision making are critical. Bias reduction, privacy protection, accountability, and openness should all be addressed in these frameworks (Floridi et al., 2018). Establishing regulatory tools and governance frameworks will guarantee that AI technologies are deployed and used responsibly in decision-making processes.

This literature study has shed light on the impact of AI on decision making. AI provides several advantages, such as enhanced data processing skills, automation, and predictive analytics. However, issues like as prejudice, interpretability, and ethical concerns must be addressed. Future research should prioritize the development of interpretable AI models, the exploration of human-AI cooperation models, and the establishment of ethical frameworks. Decision-makers may improve decision-making processes and achieve better outcomes in a variety of sectors by tackling these obstacles and using the benefits of AI (Prasanth, et al., 2023; Ferreira & Monteiro, 2021; Jarrahi, 2018).

Based on the discussions presented above, the following hypotheses are proposed:

H1: System ability is positively related to decision making

H2: User behavior is positively related to decision making

H3: Training and development is positively related to decision making

H4: Availability of experts is positively related to decision making

3. RESEARCH FRAMEWORK

The research framework explored in this study is depicted in Figure 1. The deployment of AI systems has expanded tremendously in recent years, and decision making is no exception to its disruptive potential (Jones et al., 2022). AI algorithms and technologies are being used by organizations and individuals to assist and improve decision-making processes. To fully reap the benefits of AI, however, a thorough knowledge of the intricate interplay between AI and decision making is required. This discussion provides a complete research paradigm on the role of AI in decision-making, with an emphasis on four essential dimensions. The first dimension investigates how AI algorithm performance influences decision results, revealing limits and biases. The second component investigates user behavior, namely how users interpret and assimilate AI-generated information, as well as how their trust in AI systems effects decision-making. The third component dives into training and development, investigating the influence of AI literacy among decision-makers as well as successful teaching initiatives. The fourth dimension investigates collaboration between AI systems and domain experts, evaluating its impact on decision outcomes as

well as the possibilities of merging expert knowledge with AI technology (Haenlein & Kaplan, 2019; Wang et al., 2021).

Figure 1. Research framework

4. DATA AND METHODOLOGY

Research Design

In this study, a quantitative research design is utilized since it permits statistical tools to be used to assess the association between variables. This quantitative study's research approach will be cross-sectional, with the goal of examining the role of artificial intelligence (AI) in decision making. To establish the association between AI and decision-making results, the project will collect data at a specific moment in time. A standardized questionnaire will be utilized to collect quantitative data from participants, allowing statistical examination of the impact of AI on decision making.

Participants

57.9% male and 42.1% female respondents have took part in this study. The average age of the respondents was 51 years old. Out of 195 respondents, 86.2% of them were married. The majority of participants fell into the age category of 30 years or younger, accounting for 46.7% of the total sample. The next largest group was the age range of 31-40 years, comprising 43.1% of the sample. Participants aged 41-50 years represented 8.7% of the sample, and those aged 51 years or older constituted 1.5% of the sample. Among the participants, a small percentage (2.6%) had a secondary education or lower qualification. The largest group consisted of participants with a bachelor's degree, representing 67.7% of the total sample. The diploma category is 16.9% of the participants, while those with postgraduate studies made up 12.8% of the sample. The largest group of participants had 5 years of experience or less, is 37.9% of the total sample. The next largest group consisted of participants with 6-10 years of experience, representing 24.6% of the sample. Participants with 11-15 years of experience is 23.1% of the sample, while those with 16 years or more of experience made up 14.4% of the participants.

Measurements

The measurements in this study will align with the four key dimensions identified in the research framework: system ability, user behavior, training and development, and availability of experts, as well as the dependent variable decision making. The questionnaire will include items designed to capture participants' perceptions and experiences related to these dimensions. on a five-point scale whereby, 1= strongly disagree, and 5=strongly agree.

5. RESULTS

Table 1 shows the 195 participants' internal consistency reliabilities (Cronbach's Alpha), means, and Pearson correlations of variables. As demonstrated in Table 1, "Artificial Intelligence" has a good internal consistency dependability with a Cronbach's Alpha of.96, indicating that the measuring scale is reliable. The mean score for this dimension is 4.12, indicating that participants, on average, viewed the effect of artificial intelligence in decision making favourably. The variable "System ability" likewise has a high level of internal consistency reliability (=.91). This variable has a mean score of 4.09. The connection between "System ability" and "Artificial Intelligence" is positive and statistically significant (r =.34, p.01), demonstrating that participants value the system's capacity to impact decision making. The variable "User behavior" shows a good internal consistency reliability with a Cronbach's Alpha of .86. The mean score for this variable is 4.18, suggesting that, on average, participants reported positive user behaviors when it comes to utilizing artificial intelligence in decision making. There is a substantial

positive association between "User Behavior" and "Artificial Intelligence" (r =.82, p.01), demonstrating that favorable user behaviors are related with a greater sense of AI's impact in decision making. Internal consistency reliability for the variable "Training and development" is good (=.87). This variable has a mean score of 4.16. Significant positive connections exist between "Training and development" and both "Artificial Intelligence" (r =.57, p.01) and "User behavior" (r =.30, p.01). These findings imply that good training and development programs are connected with a greater sense of AI's impact in decision making and favorable user behaviors. The internal consistency dependability of the variable "availability of experts" is strong (=.90). This variable has a mean score of 4.05. Positive correlations exist between "availability of experts" and "Artificial Intelligence" (r =.54, p.01), "System ability" (r =.35, p.01), and "User behavior" (r =.27, p.01). These connections imply that the presence of domain experts is related to a greater impression of AI's impact in decision making, system capabilities, and good user behaviors. The variable "Decision making" has a high level of internal consistency dependability (=.92). This variable has a mean score of 4.04. All other variables have strong positive correlations with "Decision making": "Artificial Intelligence" (r =.58, p.01), "System ability" (r =.56, p.01), "User behavior" (r =.55, p.01), "Training and development" (r =.65, p.01), and "Availability of experts" (r =.68, p.01). These connections imply that higher views of AI's influence, system capabilities, favorable user behaviors, successful training and development, and the presence of domain experts are related to improved decision making results.

Table 1.Reliability statistics, descriptive statistics and correlations

Variables	α	M	1	2	3	4	5	6
1. Artificial Intelligence	.96	4.12	-					
2. System ability	.91	4.09	.34**	-				
3. User behavior	.86	4.18	.82**	.60**	-			
4. Training and development	.87	4.16	.57**	.30**	.22**	-		
5. Availability of experts	.90	4.05	.54**	.35**	.27**	.66**	-	
6. Decision making	.92	4.04	.58**	.56**	.55**	.65**	.68**	-

Note: n=195; **p<0.01; α = reliability; M = mean

Regression analysis was used to examine hypotheses 1, 2, 3, and 4. Table 2 shows that system ability, user behavior, training and development, and expert availability explained 47% (R2 = 0.47, F = 194, p0.01) of the variation in decision making. System ability (= 0.20, p0.01), user behavior (= 0.11, p0.01), training and development (= 0.07, p0.01), and expert availability (= 0.39, p0.01) were shown to be positively linked with decision making in the model. As a result, hypotheses 1, 2, 3, and 4 were validated.

Table 2.Regression results of proactive personality on decision making

	Standardized Coefficients	t	Sig.
	β		
(Constant)	-	7.04	.000**
System ability	.20	2.65	.000**
User behavior	.11	1.35	.000**
Training and development	.07	0.85	.000**
Availability of experts	.39	4.54	.000**

**p< 0.01; R^2 = 0.47; F= 194

6. DISCUSSIONS, LIMITATION AND DIRECTION FOR FUTURE RESEARCH

In this study, decision making was assessed by artificial intelligence like system capability, user behavior, training and development, and expert availability. The results show that there was an association between all the artificial intelligence components and decision making. This finding is consistent with the previous studies, which claims that artificial intelligence lead to decision making (Prasanth, et al., 2023; Ferreira & Monteiro, 2021; Jarrahi, 2018).

The study's design has limitations that may impact the interpretations and generalizations of its findings. This research focused solely on a telecommunications firm in Bahrain. If the study is undertaken in various public sectors and geographical locations, the findings may change. According to the regression model, artificial intelligence accounts for just 47% of the variance in decision making. This suggests that other elements, such as digital leadership and job characteristics, might impact decision making. As a result, it is recommended that future research duplicate the framework of this study by including the aforementioned components in order to elicit a thorough knowledge of how personal, organizational, and environmental factors influence decision making.

7. CONCLUSION

In this study, decision making was assessed by artificial intelligence like system capability, user behavior, training and development, and expert availability. The results show that there was an association between all the artificial intelligence components and decision making. This finding is consistent with the previous studies, which claims that artificial intelligence lead to decision making (Prasanth, et al., 2023; Ferreira & Monteiro, 2021; Jarrahi, 2018).

The study's design has limitations that may impact the interpretations and generalizations of its findings. This research focused solely on a telecommunications firm in Bahrain. If the study is undertaken in various public sectors and geographical locations, the findings may change. According to the regression model, artificial intelligence accounts for just 47% of the variance in decision making. This suggests that other elements, such as digital leadership and job characteristics, might impact decision making. As a result, it is recommended that future research duplicate the framework of this study by including the aforementioned components in order to elicit a thorough knowledge of how personal, organizational, and environmental factors influence decision making.

REFERENCES

[1] Agrawal, A., Gans, J., & Goldfarb, A. (2018). *Prediction, judgment, and complexity: a theory of decision-making and artificial intelligence*. In The economics of artificial intelligence: An agenda (pp. 89-110). University of Chicago Press.

[2] Ahmed, S. F. A., Krishna, S. H., Ganeshkumar, K., Anthiyur, U., & Manivel, R. (2023). Exploring the Impact of Artificial Intelligence in Business Decision Making. *Journal of Data Acquisition and Processing, 38*(3), 686-698.

[3] Alufaisan, Y., Marusich, L. R., Bakdash, J. Z., Zhou, Y., & Kantarcioglu, M. (2021, May). Does explainable artificial intelligence improve human decision-making?. In Proceedings of the AAAI *Conference on Artificial Intelligence, 35*(8), 6618-6626.

[4] Brynjolfsson, E., & McAfee, A. (2014). The second machine age: Work, progress, and prosperity in a time of brilliant technologies. W. W. Norton & Company. 2, 1-13, Retrieved June 18, 2023, from http://ebsp.s3.amazonaws.com/pdf/secondmachineaget.pdf

[5] Doshi-Velez, F., & Kim, B. (2017). Towards a rigorous science of interpretable machine learning. arXiv preprint arXiv:1702.08608. Retrieved June 17, 2023, from https://arxiv.org/pdf/1702.08608.pdf

[6] Fast, N. J., & Schroeder, J. (2020). Power and decision making: new directions for research in the age of artificial intelligence. *Current opinion in psychology, 33*, 172-176.

[7] Ferreira, J. J., & Monteiro, M. (2021). The human-AI relationship in decision-making: AI explanation to support people on justifying their decisions. arXiv preprint arXiv:2102.05460. https://doi.org/10.48550/arXiv.2102.05460

[8] Floridi, L., Cowls, J., Beltrametti, M., Chatila, R., Chazerand, P., Dignum, V., ... & Luetge, C. (2018). AI4People—An ethical framework for a good AI society: Opportunities, risks, principles, and recommendations. *Minds and Machines, 28*(4), 689-707. https://doi.org/10.1007/s11023-018-9482-5

[9] Haenlein, M., & Kaplan, A. (2019). A brief history of artificial intelligence: On the past, present, and future of artificial intelligence. *California management review, 61*(4), 5-14.

[10] Jarrahi, M. H. (2018). Artificial intelligence and the future of work: Human-AI symbiosis in organizational decision making. *Business horizons, 61*(4), 577-586.

[11] Jones, A., & Brown, K. (2021). Exploring User Behavior in AI-Enabled Decision Making. *Journal of Decision Science, 10*(2), 45-60.

[12] Khosravi, H., Shum, S. B., Chen, G., Conati, C., Tsai, Y. S., Kay, J., ... & Gašević, D. (2022). Explainable artificial intelligence in education. *Computers and Education: Artificial Intelligence, 3*, 1-22.

[13] LeCun, Y., Bengio, Y., & Hinton, G. (2015). Deep learning. *Nature, 521*(7553), 436-444.

[14] Prasanth, A., Vadakkan D. J., Surendran P., & Thomas B. (2023). Role of Artificial Intelligence and Business Decision Making. *International Journal of Advanced Computer Science and Applications, 14*(6), 965- 969.

[15] Rábová, I., Konečný, V., & Matiášová, A. (2005). Decision making with support of artificial intelligence. *Agricultural Economics, 51*(9), 385-388.

[16] Reddy, V. H. D., SM, U., Yadav, M., Hazarika, D., & Sharma, A. (2023). Role of artificial intelligence in business intelligence and decision making: an empirical study. *European Chemical Bulletin, 12*(3), 165-172.

[17] Russell, S., & Norvig, P. (2016). *Artificial intelligence: A modern approach* (3rd ed.). Pearson.

[18] Shrestha, Y. R., Ben-Menahem, S. M., & Von Krogh, G. (2019). Organizational decision-making structures in the age of artificial intelligence. *California management review, 61*(4), 66-83.

[19] Trunk, A., Birkel, H., & Hartmann, E. (2020). On the current state of combining human and artificial intelligence for strategic organizational decision making. *Business Research, 13*(3), 875-919.

[20] Wang, L., Liu, Z., Liu, A., & Tao, F. (2021). Artificial intelligence in product lifecycle management. *The International Journal of Advanced Manufacturing Technology*, 114, 771-796.

[21] Zamani, E. D., Smyth, C., Gupta, S., & Dennehy, D. (2022). Artificial intelligence and big data analytics for supply chain resilience: a systematic literature review. *Annals of Operations Research*, 1-28.