Turkish Online Journal of Qualitative Inquiry (TOJQI)
Volume 12, Issue 10, October 2021 :3428 – 3435

Research Article

Artificial Intelligence in E-Commerce Management: Benefits and Challenges

Sunny Omenazu
PhD Management Student, Limkokwing University, Malaysia

Abstract

Artificial intelligence is a significant IT technology that has the potential to perform human interaction activities using computing systems and machines. E-Commerce companies like Amazon, Myntra and other companies are using AI technology for handling business concerns and improving customer satisfaction by delivering proper products and services. This research provides a platform for reviewing the benefits and challenges of AI technology in E-Commerce companies. The included literature review helped to include effective and reliable information in the research and managed research gaps. It may be concluded that AI technology has various benefits for E-Commerce such as warehouse automation, improve business performance, customer satisfaction, and many more. However, AI technology requires larger costs, proper knowledge, or awareness in the workplace and leads to the rate of unemployment. The future research will describe applications of AI and machine learning in the E-Commerce industry and will conduct a survey for obtaining primary data in the study.

Keywords: Artificial Intelligence; E-Commerce; Technology; Machine Learning; E-Commerce Management.

1. INTRODUCTION

The term AI refers to "Artificial intelligence" which is a technology that simulates human intelligence in computer systems in order to think and perform like humans. AI is one of the effective information technologies used in E-Commerce management in order to propose effective automated systems and perform business operations using computer machines and automated systems. In terms of effectiveness, AI technology is more effective that enable e- commerce companies to reduce business problems and improve business effectiveness. Numerous E-Commerce companies are now using AI-based automated systems for handling workability and improving performance such as Amazon, Flipkart, Myntra, and many more. This research has done the content analysis by reviewing previous studies and journal articles related to the AI technology used in the E-Commerce industry and its benefits and challenges.

1.1. Aims and objectives

The major aim of the paper is to review the role of AI technology in E-Commerce and highlight its benefits and challenges. There are the following objectives of this research.

- *To understand the importance of AI in E-Commerce management*
- *To highlight benefits of AI in e-commerce*
- *To review challenges of AI occurred in the E-Commerce industry.*

2. LITERATURE REVIEW

It is demonstrated that AI is a significant technology where numbers of research articles were issued and provided in the last five years that will be analyzed in this research. The intention of the literature is to highlight the benefits and challenges related to the artificial intelligence used in e-commerce.

2.1. Advantages of AI Technology in E-Commerce

There are numbers of advantages of AI technology in the field of E-Commerce companies which are described below:

2.1.1. Personalization of Online Purchases

Albayrak, Özdemir, and Zeydan, (2018) reported that artificial intelligence is a significant technology that has the potential to enable E-Commerce companies for personalizing of online purchasing activities which leads to organizational performance and effectiveness. Using AI- based systems; E-Commerce companies like Amazon, Myntra, and many more are capable to propose personalized and interactive purchasing experiences.

AI-based networks are now linked with the business and management departments of e- commerce that help to review consumer's preferences in real-time and deliver effective shopping experiences. Ballestar, Grau-Carles, and Sainz, (2019) agreed and highlighted that artificial intelligence in E-Commerce delivers effective product suggestions by reviewing collected data from the internet and handle customer problems and issues effectively. AI plays a significant character in classifying client behavior over personalization and, by evaluating clicks, shopping wagons, purchasing past, and search requests. All these can aid E-Commerce products to transport suitable propositions for supplementary acquisitions that make sense in the eyes of the customer.

Proposition 1: *AI technology is capable to personalize online purchase in E-Commerce companies.*

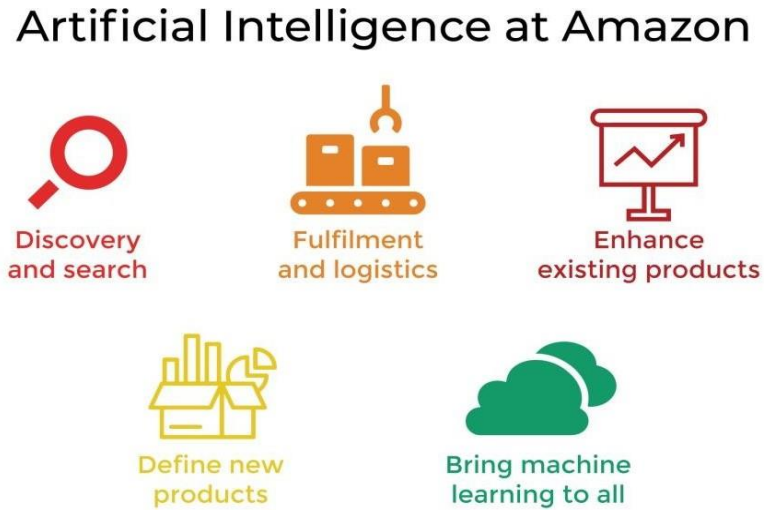

Figure 1: *AI in Amazon (Source: Girdher, 2019)*

2.1.2. Warehouse automation

It is demonstrated that artificial intelligence is capable to develop automated systems that are capable to propose effective warehouse systems in the E-Commerce industry by which products can be stored

effectively. Girdher, (2019) agreed and reported that AI-based systems in e- commerce companies are transforming warehouse management and enable employees to streamline product pick and packing procedures without requiring human assistance. AI-based robots are now implemented by Amazon organization in the warehouse that works more effectively and 24/7 by which data storing, product handling, and reduction of errors in a reliable manner. In terms of efficiency, AI technology is more efficient and accurate that has the ability to monitor warehouse operations performed by E-Commerce companies effectively. The AI- based robot also performs high-risk activities in warehouses and thus is helpful for refining the welfare of workers at the warehouse.

Proposition 2: *Artificial intelligence has the potential to develop automated systems in the warehouses.*

2.1.3. Improve business performance and efficiency

Howard, (2019) proposed research and examined that AI is capable to enable E-Commerce companies for reviewing business problems and analyzing collected data in a significant manner that positively impacts on the performance of the businesses. Amazon, Myntra, Flipkart, and other E-Commerce companies are capable to predict the nature of the customers along with their requirements regarding online shopping using AI based systems and networks. When buying online a client should have a humble search procedure but in numerous cases, the expedition from penetrating to seeing an artifact is a path filled with annoyances that often indications to no- purchase at all. AI-based search comforts the way customers see a product and capable to provide products at the cheapest prices to the customers that lead to business performance and efficiency.

2.1.4. Develop automated systems and virtual assistants

It is true that AI technology enables companies to communicate with machines and propose automated systems by which business activities can be performed effectively. Kumar and Trakru, (2020) agreed and reported that E-Commerce companies are now capable to shift their manual operations to automated systems using AI technology and deliver effective services and products to the customers.

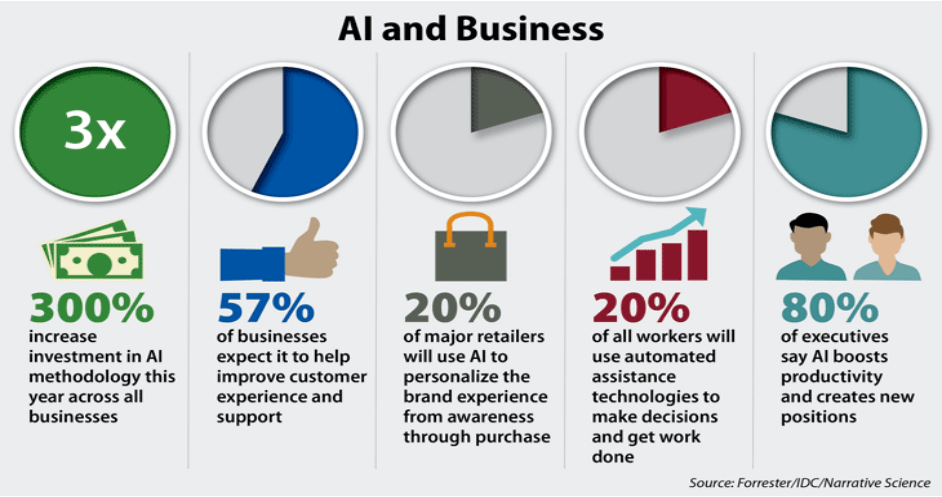

Figure 2: *AI in business (Source: Li, 2019)*

For example, Amazon has implemented AI-based Chatbots which are linked with the communication channels and able to interact with the customers, provide proper updates regarding their products and address their queries significantly. AI Chatbots have the potential to provide virtual assistant to the customers that positively impact on the performance and improve customer satisfaction effectively.

2.1.5. Improve customer satisfaction and loyalty

According to Li, (2019), AI technology is now connected with the E-Commerce management and businesses where effective decisions are developed and significant services are providing by the companies. Customer satisfaction is the first priority of E-Commerce where AI-based networks are capable to predict market trends and review the behavior of the customers related to online shopping and deliver proper products and services that enhance customer experience and loyalty. AI technology has provided various effective systems to E-Commerce such as recommendation engine, prediction process, facial recognition, voice interfaces, and many more which are capable to understand consumer nature when purchasing a product using websites. More than 70% of the E-Commerce companies worldwide are now using AI technology for creating a significant customer experience, improving marketability and satisfaction that lead to enhancing organizational performance and productivity (Mondal, 2020).

Proposition 3: *AI technology is used in the E-Commerce companies for improving customer satisfaction and loyalty.*

2.2. Challenges Linked with AI in E-Commerce

2.2.1. Increase Implementation and Maintenance

It is demonstrated that AI technology is an advanced technology that requires effective infrastructure in the businesses and it is difficult for E-Commerce companies to manage implementation and maintenance costs. Patil and Rao, (2019) agreed and reported that AI-based systems require proper interaction and dependent on computer networks and machines where the maintenance rate is high due to which business expenses can be increased and financial problems may be produced in the workplace. It is important for E-Commerce companies to manage cost- related problems while moving towards digital transformation so that significant AI systems can be implemented and performance levels can be improved.

Proposition 4*: AI technology requires larger implementation and maintenance costs in the businesses*

2.2.2. Require proper knowledge and awareness

Soni, (2020) reported that awareness about AI technology is a challenging problem for e- commerce companies where employees and workers are not experienced in AI networks and systems due to which operation failure issues may be produced. While implementing AI technology in e-commerce, management needs to hire AI experts in order to provide training and awareness to the employees which also lead to costs for the businesses (Vanneschi, et al., 2018). Moreover, improper security measures in the AI networks can enable criminals to perform hacking and cyber-attacks in E-Commerce companies and data loss concerns may be produced in the workplace.

2.2.3. Increase rate of unemployment

It is demonstrated that AI technology enables E-Commerce companies to propose automated and human interaction machines where business operations and activities can be performed without requiring human assistance and employees. Due to the larger implementation of AI robots, automated systems, and machine learning programs in the workplace, it is difficult to secure jobs for the employees which can lead to the unemployment problem. Tang, (2020) agreed and highlighted that the uses of AI-based automated systems in E-Commerce improve organizational efficiency but negatively impact on the job of the employees as AI technology does not require numbers of employees for performing business operations due to which unemployment can be increased. Therefore, it is significant for the employees to enhance understanding and knowledge about AI technology so that they can secure their jobs effectively.

3. RESEARCH METHODS

A research methodology is an important portion of the research that enables the authors to propose effective research outlines, approaches, and techniques for addressing research problems and concerns. Various research methodologies are added in this study for example research design, data collection, and research approach, and data analysis.

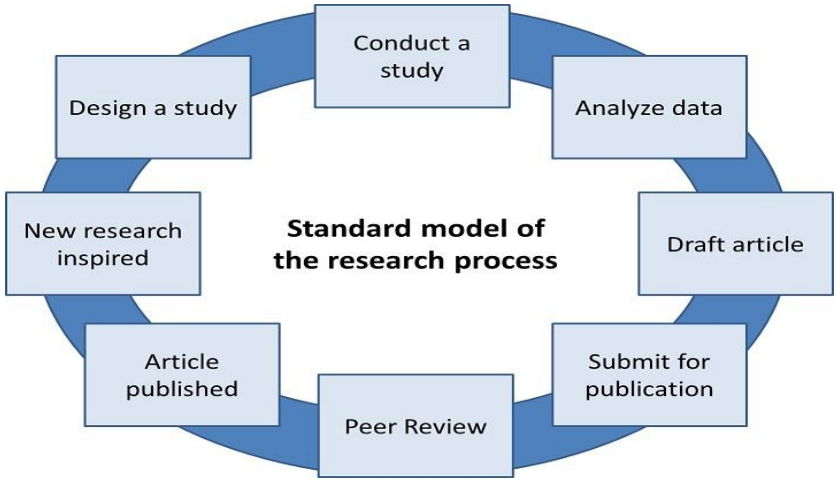

Figure 3: *Research Methodology Framework (Source; Tang, 2020)*

It is demonstrated that research design is a more appropriate methodology that allows the writers to designs significant research plans and outlines so that problems and gaps can be managed in a significant manner. Mainly, the qualitative design is included as it is capable to deliver theoretical and reliable information related to AI technology used in E-Commerce and manage research issues. With the help of qualitative design, effective plans are proposed and implemented in the study.

There are following propositions considered by this research:

P_1: *AI technology is capable to personalize online purchase in E-Commerce companies.*

P_2: *Artificial intelligence has the potential to develop automated systems in the warehouses.*

P_3: *AI technology is used in the E-Commerce companies for improving customer satisfaction and loyalty.*

P_4: *AI technology requires larger implementation and maintenance costs in the businesses*

The inductive approach is also added in the research because it has the ability to focuses on the research problems and provides depth information in the study by which proposed objectives can be achieved significantly. This approach also helped the writer to get a better direction in the research so that level of effectiveness can be improved. Data collection is another significant methodology that provides a platform to gain effective facts and information in the paper. It is found that secondary methods are used by the researcher for obtaining information in regards to AI technology and its benefits and challenges to E-Commerce companies (Yang, 2019). For gaining secondary data, systematic literature is included that enabled to review of findings of recent papers related to the research topic and addressed research gaps significantly.

Data analysis is a significant methodology used in the research that provided a way to analyze the collected data in the research and provided significant results or findings. Descriptive content analysis is used due to its ability to provide reliable results in the study by addressing research problems and questions. Therefore, all these are effective methods adopted by the writer for completing the research study.

4. DISCUSSION AND RESULTS

It is found that AI is a significant technology that provides a platform to review business problems and propose effective decisions by which E-Commerce companies can perform business activities effectively.

Figure 4: *AI benefits in E-Commerce (Source: Zhang, Pee and Chui, 2021)*

E-Commerce companies like Amazon, Myntra, Flipkart, and many more are now accessing AI- based networks for developing automated systems and providing virtual assistance to the customers. AI Chatbot is the best innovation performed by Amazon organization that has the potential to perform communication activities (Zhang, Pee, and Cui, 2021)

.

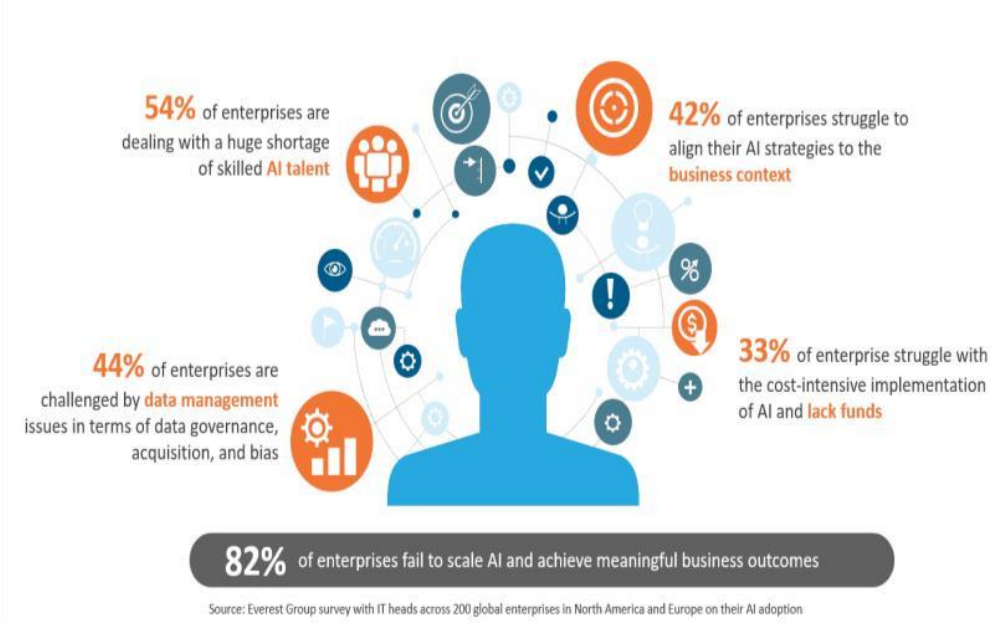

Figure 5: *AI challenges (Source: Soni, 2020)*

The included literature enabled us to gain information related to AI technology and its importance in the field of e-commerce. Moreover, selected research papers and articles are more effective than provided depth information about artificial intelligence and helped to gain significant points. AI-based robots are now implemented by Amazon organization in the warehouse that works more effectively and 24/7 by which data storing, product handling, and reduction of errors in a reliable manner. In terms of efficiency, AI technology is more efficient and accurate that has the ability to monitor warehouse operations performed by E-Commerce companies effectively.

5. CONCLUSION & FUTURE RECOMENDATIONS

From the above discussion, it may be concluded that AI is a more significant technology for e- commerce companies by which business performance and efficiency can be improved and operations can be done through machines and automated systems. This research helped to improve understanding related to the AI technology used in E-Commerce companies and reviewed its benefits and challenges. Artificial intelligence in E-Commerce delivers effective product suggestions by reviewing collected data from the internet and handle customer problems and issues effectively. AI-based systems in E-Commerce companies are transforming warehouse management and enable employees to streamline product pick and packing procedures without requiring human assistance. AI-based search comforts the way customers see a product and capable to provide products at the cheapest prices to the customers that lead to business performance and efficiency. The future research will describe applications of AI and machine learning in the E-Commerce industry and will conduct a survey for obtaining primary data in the study.

REFERENCES

1. Albayrak, N., Özdemir, A. and Zeydan, E., (2018) An overview of artificial intelligence based chatbots and an example chatbot application. In *2018 26th Signal processing and communications applications conference (SIU)*, 6(5), pp. 1-4.
2. Ballestar, M.T., Grau-Carles, P. and Sainz, J., (2019) Predicting customer quality in E-Commerce social networks: a machine learning approach. *Review of Managerial Science*, 13(3), pp.589-603.

3. Girdher, S., (2019) Role of Artificial Intelligence in Transforming E-Commerce Sector. *RESEARCH REVIEW International Journal of Multidisciplinary*, 4(06), pp.282-284.

4. Howard, J., (2019) Artificial intelligence: Implications for the future of work. *American Journal of Industrial Medicine*, 62(11), pp.917-926.

5. Kumar, T. and Trakru, M., (2020) The Colossal Impact of Artificial Intelligence. E-Commerce: Statistics and Facts. *Int. Res. J. Eng. Technol.(IRJET)*, 6, pp.570-572.

6. Li, L., (2019) E-Commerce Data Analysis Based on Big Data and Artificial Intelligence. In *2019 International Conference on Computer Network, Electronic and Automation (ICCNEA)*, 6(4), pp. 133-138.

7. Mondal, B., (2020) Artificial intelligence: state of the art. *Recent Trends and Advances in Artificial Intelligence and Internet of Things*, pp.389-425.

8. Patil, M. and Rao, M., (2019) Studying the contribution of machine learning and artificial intelligence in the interface design of E-Commerce site. In *Smart intelligent computing and applications*, pp. 197-206.

9. Soni, V.D., (2020) Emerging Roles of Artificial Intelligence in ecommerce. *International*

Journal of trend in scientific research and development, 4(5), pp.223-225.

10. Tang, J., (2020) Artificial Intelligence-based E-Commerce Platform based on SaaS and Neural Networks. In *2020 Fourth International Conference on Inventive Systems and Control (ICISC)*, pp. 421-424.
11. Vanneschi, L., Horn, D.M., Castelli, M. and Popovič, A., (2018) An artificial intelligence system for predicting customer default in e-commerce. *Expert Systems with Applications*, 104, pp.1-21.
12. Yang, X., (2019) Satisfaction Evaluation and Optimization of Tourism E-Commerce Users Based on Artificial Intelligence Technology. In *2019 International Conference on Robots & Intelligent System (ICRIS)*, 6(4), pp. 373-375.
13. Zhang, D., Pee, L.G. and Cui, L., (2021) Artificial intelligence in E-Commerce fulfillment: A case study of resource orchestration at Alibaba's Smart Warehouse. *International Journal of Information Management*, 57.