



## Provide a Model for an E-Commerce System with the Impact of Artificial Intelligence

Ramez Kian<sup>1</sup>

<sup>1</sup> Nottingham Business School, Nottingham Trent University, Nottingham NG1 4FQ, UK

ARTICLE INFO	ABSTRACT
<p><i>Received: 25 July 2021</i></p> <p><i>Reviewed: 15 August 2021</i></p> <p><i>Revised: 25 August 2021</i></p> <p><i>Accept: 06 September 2021</i></p>	<p><b>Purpose:</b> In less industrialized today, competition is as fierce as in e-commerce. Not just online and physical stores, but the entire Internet space is competing with online retailers. Today, AI-based platforms are a vital element for e-commerce success. Artificial intelligence in digital marketing plays a constructive role in data-based decisions, because through deep learning (Deep learning) can predict user behavior from beginning to end of the purchase path. In today's world, customer behavior has changed.</p> <p><b>Methodology:</b> When a customer feels a need, they first search for it on the Internet. Accordingly, many e-commerce retailers, with artificial intelligence capabilities, try to integrate textual, visual, and audio capabilities; Especially through "conversation business" to attract more customer attention. Retailers because customer needs are growing rapidly; They are always trying to have the best sales. Accordingly, if brands want to be more durable, the principle is to consider the needs of customers who are growing rapidly; One of the important priorities is business strategies.</p> <p><b>Findings:</b> Therefore, the role of chat bots, which are actually computer programs designed to simulate conversations with human users on the Internet, is very important in "conversation business".</p> <p><b>Originality/Value:</b> In this study, the effect of artificial intelligence on e-commerce is investigated and the most important functions of this tool are analyzed.</p>
<p><b>Keywords:</b> <i>E-Commerce, Artificial Intelligence, E-Business, Business Intelligence.</i></p>	

<sup>1</sup> Corresponding Author: [ramez.kian@ntu.ac.uk](mailto:ramez.kian@ntu.ac.uk)  
<https://doi.org/10.52547/ijimes.1.3.88>

## 1. Introduction

The digital world is constantly undergoing a massive transformation and moving forward. Today, e-commerce has a major role to play in the business world. Machine learning technologies, such as artificial intelligence, are well-known and very popular in the digital world as the best way to compete. The pace of progress and advancement of the digital economy does not seem to be slowing down any time soon. The digital transformation will undoubtedly continue on its path, and organizations can use different applications and technologies such as artificial intelligence to serve their customers in a personal, informative and profitable way. The correct information and insight that this technology provides, can accurately predict any point of decision and customer interaction and help businesses a lot. In the new world of digital economy, artificial intelligence technology is recognized as a very useful sales and marketing tool for businesses. Of course, the correct use of this technology and training of the workforce at all levels is also necessary [1]. The main benefits of using artificial intelligence technology include strengthening customer relationships, staying competitive, and increasing workforce productivity.

Artificial intelligence has three key elements: data mining, natural language recognition, and machine learning. These elements help existing businesses in the field of e-commerce to have better results. With the help of artificial intelligence, machines are learning how to help us and how to do our handicrafts, and the interesting thing is that they do their job incredibly well. They allow us to focus more on the strategic issues of our business [2]. Artificial intelligence is the technology that will have the greatest impact on e-commerce in the coming years. According to Gartner, most organizations that use artificial intelligence in their e-commerce operating systems will achieve at least a 25 percent increase in customer satisfaction by 2023, along with increased revenue and reduced costs. The use of artificial intelligence technology has two positive aspects. On the one hand, when used in areas such as fraud detection, price optimization, and customer segmentation, it can increase business efficiency. On the other hand, this technology has a great potential to increase the user experience by providing product recommendations and content personalization and improving search capabilities. All of this will help companies differentiate themselves and gain more competitive power [3]. Artificial intelligence can help boost e-sales by providing customer buying behavioral patterns through personal and guided processes, inventory control, and support for answering questions. Examining and understanding the tastes of each customer individually makes it possible to easily predict the customer's buying behavior during transactions [4]. Achieving this goal with the help of machine learning systems provides the possibility of instantaneous content change based on user behavior and predicts the buyer's next step in the online store, and by simplifying the buying process, guides merchants one step further [5]. In addition, virtual chats or assistants, which are artificial intelligence software that simulate a conversation with a user in natural language through messaging apps, websites, or mobile apps, not only improve customer communication, but also increase customer satisfaction. Artificial intelligence helps e-commerce operating systems to predict future demand by analyzing consumption patterns and anticipating existing needs. This increase in efficiency reduces costs and improves business performance [6].

The structure of this paper is as follows. In the second part, some of the most important functions of artificial intelligence in e-commerce are discussed in the form of literature review. In the third part, an analytical model for the e-commerce system with the impact of artificial intelligence is presented and in the fourth part, a conclusion is presented.

## 2. The Role of Artificial Intelligence in E-Commerce

In the business world, we rarely see a more competitive market than e-commerce. In this market, online sellers, in addition to fierce competition with each other and real stores; They need to make a name for themselves in the bustling Internet market. A potential concern with the use of artificial intelligence for marketing and sales is that it may replace human resources, but in fact it is a powerful tool that will help vendors deliver products through specific and practical advice. That customers are interested in buying to distribute. In addition, artificial intelligence can provide a more accurate insight into pricing, thereby increasing vendors' revenue and profitability [7]. Artificial intelligence can more accurately and better identify specific patterns that govern customers' shopping habits. While man may have many mistakes and errors in this regard or even ignore some cases. The consumer market and online sales pave the way for digital transformation and prove to customers that their needs are being met quickly and accurately. Amazon Digital, one of the largest online retailers, uses artificial intelligence technology to predict potential customers' future buying behaviors based on their current recommendations, orders and tastes. Amazon can even pre-ship products to places that customers are likely to order [8].

In addition, artificial intelligence can provide a more accurate insight into pricing, thereby increasing vendors' revenue and profitability. Artificial intelligence can more accurately and better identify specific patterns that govern customers' shopping habits. While man may have many mistakes and errors in this regard or even ignore some cases [9]. Artificial intelligence is known as the best option to overtake in the digital world and as a sales and marketing tool. The main benefits of using artificial intelligence include strengthening customer relationships, staying competitive, and increasing labor productivity. Digital companies selling intermediate goods can also improve the quality of their customer service by implementing software such as artificial intelligence and machine learning. Most organizations believe that artificial intelligence can help them anticipate customer needs, automate orders, and optimize pricing, as well as have a positive impact on their sales. Artificial intelligence can help businesses impose different and correct pricing on goods based on customers' personal buying behaviors. This can ensure the profitability of companies in a growing and digital economy [10]. Figure (1) shows the most important functions of artificial intelligence in the e-commerce industry.

Some of the main benefits of using artificial intelligence in e-commerce are described below:

- ***Customer-centric intuitive search :***

Consumers are often disappointed with the e-commerce experience because, for example, the results of the products shown may be irrelevant to their search. To combat this problem, artificial intelligence uses natural language processing to improve the search results of online shoppers, as well as the ability to visually search, find and match products. Also, artificial intelligence enables buyers to find products more easily and thus increases customer satisfaction [12].

- ***Filter out fake reviews and information :***

Many e-commerce businesses today use artificial intelligence to counter fake surveys and information around the world, with a greater emphasis on validated and useful surveys. Amazon, for example, uses artificial intelligence to counter fake product reviews and rankings. AI focuses on the prominence and weight of customer-approved reviews and publishes them [13].

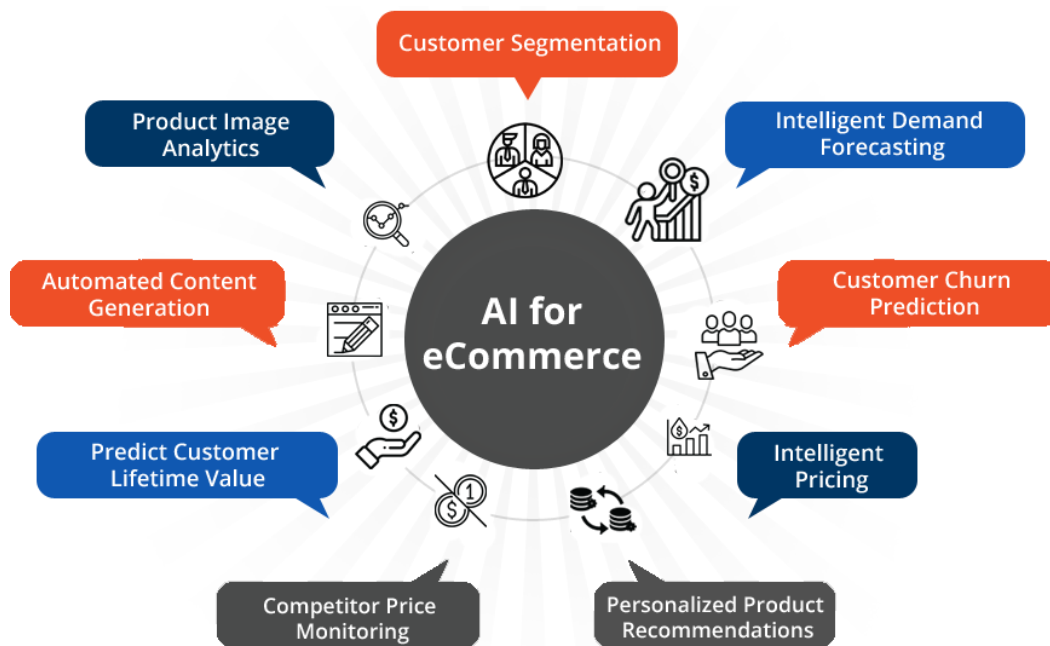


Fig. 1. The most important functions of artificial intelligence in e-commerce [11]

- ***Automation***

Automation is essential for companies and has become one of their top investment priorities in their e-commerce stores. In addition, as we know, when e-commerce businesses start to grow, the amount of repetitive work they do also increases. Robots can take on these extra tasks. Things like publishing new product lists across multiple channels, scheduling sales, giving discounts to loyal customers, and more [14].

- ***Integration of real and virtual worlds***

The approach of the real market to the virtual and finally the integration of the two should be done with the least possible steps in buying and selling in order to instill a sense of autonomy and having the most choice in the consumer. In the future, sellers will use artificial intelligence to share information that we have shared in various sections of the store website, including the product review section; They collect so that they can provide the best service in their physical store and provide us with the best product based on our priorities [15].

- ***Personalization***

In e-commerce, enabling personalization and offering customized goods based on the buyer's taste is not a new phenomenon, however, due to the introduction of artificial intelligence in this field, online brands will be equipped with much more efficient and accurate personalization tools [16].

- ***The advent of virtual shopping assistants***

Smart virtual purchasing assistants can perform much faster than their human competitors by analyzing large amounts of data in the shortest possible time. These assistants behave interactively and humanely, and their virtual personality reflects the goals and priorities of their owner brand [17].

When businesses know exactly what their customers want and can then meet those needs before competitors, customers naturally pick them out and outperform their competitors. Artificial intelligence

speeds up the pricing process and increases business confidence in digital marketing. Also, pricing teams through this technology can have a better understanding and prediction of customer expectations of prices. Data-driven forecasting, such as artificial intelligence technology, enables organizations to make more informed decisions and seize many key opportunities for revenue growth.

### 3. A Model for E-Commerce Influenced by Artificial Intelligence

In today's scenario, technologies such as artificial intelligence (AI) and machine learning (ML) are at the forefront of any innovation. These technologies mainly help to convert huge volumes of data into insights, which enable better decision making.

Collecting and analyzing customer data from a variety of sources allows us to discover insights that help accurately recommend related products or services, thus increasing sales and customer experience. Customer feedback Text mining from e-commerce sites, social media, blogs and survey websites, and the use of emotion analysis algorithms provide an accurate understanding of where customers view products / services. These valuable insights help e-commerce companies optimize their product and fill customer service gaps. In addition, this analysis also helps to discover future market trends and helps to stay ahead of competitors [18]. Figure (2) provides a framework for an e-commerce system based on artificial intelligence and machine learning.

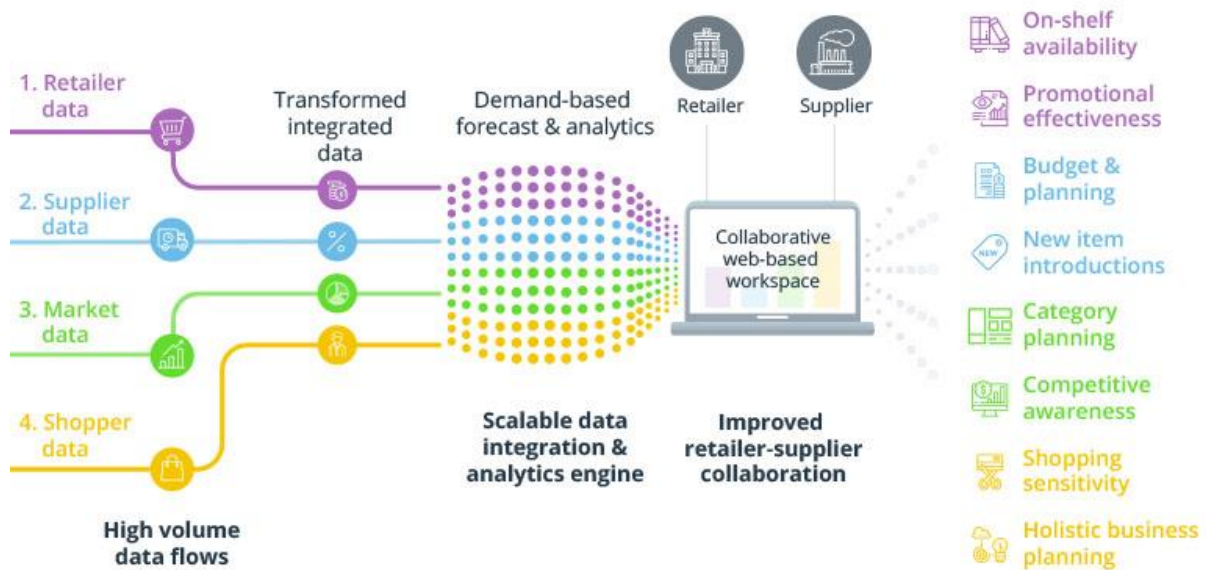


Fig. 2. A framework for an e-commerce system based on artificial intelligence [19]

Demand forecasting prevents e-commerce companies from having large quantities of goods in or out of stock. To accurately predict customer demand by analyzing historical data, forecast analysis uses a statistical technique used in machine learning. These predictive insights help e-commerce companies reduce supply chain costs and optimize financial planning, capacity planning, and risk assessment decisions [20, 21]. Marketers should use demand forecasting to encourage customers with offers to buy products / services during periods of low demand and plan resources during high demand to maintain the customer experience [22]. One common problem is that it is difficult to accurately predict demand

for new products. However, using product data from similar categories helps to overcome this challenge.

## 4. Conclusion

Artificial intelligence is advancing rapidly in the e-commerce industry. However, these systems have not yet evolved. E-commerce companies continue to improve their artificial intelligence tools to better match market demand. They also partner with other companies to integrate their AI features and develop sophisticated solutions. Certainly in the near future, artificial intelligence in the e-commerce industry will affect transactions, customer retention, satisfaction, efficiency and more. Artificial intelligence is making sweeping changes in the way we shop online. Artificial intelligence, although still relatively new, has changed many industries in a short period of time. Where artificial intelligence has previously had a major impact on industries such as finance and healthcare, the benefits of artificial intelligence have begun to expand into e-commerce. Obviously, with the advancement of technology, the capabilities of artificial intelligence continue to expand, but the purpose of this article is to examine some of the current applications of artificial intelligence in e-commerce. The fact is that artificial intelligence can and will probably change the landscape of e-commerce forever, and companies that fail to accept these changes may suffer irreparable damage.

## References

- [1] Nahr, J. G., Nozari, H., & Sadeghi, M. E. (2021). Green supply chain based on artificial intelligence of things (AIoT). *International Journal of Innovation in Management, Economics and Social Sciences*, 1(2), 56-63.
- [2] Aliahmadi, A., Jafari-Eskandari, M., Mozafari, A., & Nozari, H. (2016). Comparing linear regression and artificial neural networks to forecast total productivity growth in Iran. *International Journal of Information, Business and Management*, 8(1), 93.
- [3] Zhang, D., Pee, L. G., & 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, 102304. <https://doi.org/10.1016/j.ijinfomgt.2020.102304>
- [4] Ghahremani-Nahr, J., & Nozari, H. (2021). A Survey for Investigating Key Performance Indicators in Digital Marketing. *International journal of Innovation in Marketing Elements*, 1(1), 1-6. <https://doi.org/10.52547/ijime.1.1.1>
- [5] Nozari, H., Fallah, M., Kazemipoor, H., & Najafi, S. E. (2021). Big data analysis of IoT-based supply chain management considering FMCG industries. *Business Informatics*, 15(1), 78-96.
- [6] Cao, Y. (2021). Artificial intelligence-based plant environment detection in coastal areas and B2C e-commerce network marketing. *Arabian Journal of Geosciences*, 14(11), 1-17. <https://doi.org/10.1007/s12517-021-07352-4>
- [7] Nozari, H., & Szmelter, A. (Eds.). (2018). *Global supply chains in the pharmaceutical industry*. IGI Global. <http://doi:10.4018/978-1-5225-5921-4>
- [8] Policarpo, L. M., da Silveira, D. E., da Rosa Righi, R., Stoffel, R. A., da Costa, C. A., Barbosa, J. L. V., ... & Arcot, T. (2021). Machine learning through the lens of e-commerce initiatives: An up-to-date systematic literature review. *Computer Science Review*, 41, 100414. <https://doi.org/10.1016/j.cosrev.2021.100414>
- [9] Nozari, H., Najafi, S. E., Jafari-Eskandari, M., & Aliahmadi, A. (2016). Providing a model for virtual project management with an emphasis on IT projects. In *Project Management: Concepts, Methodologies, Tools, and Applications* (pp. 476-496). IGI Global. <http://doi:10.4018/978-1-5225-0196-1.ch023>



- [10] Liu, S. (2021, July). Novel e-commerce platform based on artificial intelligence with data structure optimization. In 2021 6th International Conference on Communication and Electronics Systems (ICCES) (pp. 1435-1439). IEEE. <https://doi.org/10.1109/ICCES51350.2021.9489238>
- [11] AI for e-Commerce. (2021). Retrieved 2021, from <https://www.aismartz.com/ai-for-ecommerce.html>
- [12] Nozari, H., & Sadeghi, M. E. (2021). Artificial intelligence and Machine Learning for Real-world problems (A survey). *International Journal of Innovation in Engineering*, 1(3), 38-47.
- [13] Ilmudeen, A. (2021). Big Data, Artificial Intelligence, and the Internet of Things in Cross-Border E-Commerce. *Cross-Border E-Commerce Marketing and Management*, 257-272. <http://doi:10.4018/978-1-7998-5823-2.ch011>
- [14] Singh, R. (2021). A Study of Artificial Intelligence and E-Commerce Ecosystem–A Customer's Perspective. *International Journal of Research in Engineering, Science and Management*, 4(2), 78-87.
- [15] Al-Shourbaji, I., & Zogaan, W. (2021). A new method for human resource allocation in cloud-based e-commerce using a meta-heuristic algorithm. *Kybernetes*. <https://doi.org/10.1108/K-03-2021-0209>
- [16] Khoali, M., Tali, A., & Laaziz, Y. (2021). A Survey of Artificial Intelligence-Based E-Commerce Recommendation System. In *Emerging Trends in ICT for Sustainable Development* (pp. 99-108). Springer, Cham. [https://doi.org/10.1007/978-3-030-53440-0\\_12](https://doi.org/10.1007/978-3-030-53440-0_12)
- [17] Nozari, H., Fallah, M., & Szmelter-Jarosz, A. (2021). A conceptual framework of green smart IoT-based supply chain management. *International Journal of Research in Industrial Engineering*, 10(1), 22-34. <https://doi.org/10.22105/RIEI.2021.274859.1189>
- [18] Hrustek, N. Ž., Mekovec, R., & Pihir, I. (2021). Developing and validating measurement instrument for various aspects of digital economy: E-commerce, E-banking, E-work and E-employment. In *Research Anthology on Digital Transformation, Organizational Change, and the Impact of Remote Work* (pp. 540-559). IGI Global. <http://doi:10.4018/978-1-7998-7297-9.ch028>
- [19] How E-Commerce Companies Can Leverage AI & ML Technologies To Ensure Business Growth. (2021). Retrieved 2021, from <https://www.setuserv.com/how-e-commerce-companies-can-leverage-ai-ml-technologies-to-ensure-business-growth>
- [20] Ghahremani Nahr, J., & Bathaee, M. (2021). Design of a humanitarian logistics network considering the purchase contract. *Journal of Decisions and Operations Research*, 6(3), 423-444. DOI: [10.22105/dmor.2021.270988.1311](https://doi.org/10.22105/dmor.2021.270988.1311)
- [21] Ghahremani Nahr, J., Kian, R., & Rezazadeh, H. (2018). A modified priority-based encoding for design of a closed-loop supply chain network using a discrete league championship algorithm. *Mathematical problems in engineering*, 2018. <https://doi.org/10.1155/2018/8163927>
- [22] Ghahremani Nahr, J. (2020). Improvement the efficiency and efficiency of the closed loop supply chain: Whale optimization algorithm and novel priority-based encoding approach. *Journal of Decisions and Operations Research*, 4(4), 299-315. DOI: [10.22105/dmor.2020.206930.1132](https://doi.org/10.22105/dmor.2020.206930.1132)

