Proceedings of the 2nd International Conference on Management Research and Economic Development
DOI: 10.54254/2754-1169/86/20240948

Enabling ZARA's Operational Innovation and Value Creation with Artificial Intelligence

Jiaqi Cao[1,a,*]

[1]*Liaoning Normal University, Dalian, 116029, China*
a. jc847s@login.missouristate.edu
**corresponding author*

Abstract: As a globally recognized fashion label, ZARA is famous for its quick fashion designs and efficient supply chain management. However, to stay competitive in an age of rapid technological advancement, ZARA must continuously innovate and leverage technology to enhance its operations. This paper primarily explores the following aspects: Firstly, how artificial intelligence is utilized by ZARA to achieve swift responses and adaptable methods in the design and production processes; Secondly, how artificial intelligence is employed by ZARA to optimize supply chain management, enhance production efficiency, and mitigate inventory risks; Lastly, it will analyze the operational model of ZARA as a source of inspiration for fast fashion enterprises and its relevance to other industries. After conducting thorough analysis and research on the integration of science and technology in ZARA's operations, this study has arrived at the following conclusions: ZARA effectively utilizes artificial intelligence to swiftly respond to market demands and make flexible adjustments, thereby enhancing its ability to meet customer needs. AI also enhances the efficiency and reliability of ZARA's supply chain management, leading to improved production efficiency and reduced inventory risk. By leveraging AI, ZARA can offer personalized shopping experiences to customers, ultimately boosting satisfaction levels and fostering loyalty. This paper delves into how technology drives operational innovation and value creation at ZARA, offering valuable insights for other fashion brands while serving as an empirical case for research in the realm of science, technology, and operations management.

Keywords: Technology empowerment, operation creation, fast fashion, ZARA, value creation

1. Introduction

Artificial intelligence holds great potential for driving operational innovation and creating value in the fast fashion industry. Currently, there has been some research progress in artificial intelligence, including recommendation systems, inventory management, and supply chain optimization.

However, there are still research gaps in how artificial intelligence can enable ZARA's operational innovation and value creation, particularly in terms of leveraging AI to enhance business performance and its impact on customer experience. This paper aims to explore the use of artificial intelligence in enabling operational innovation and value creation for ZARA. Specifically, it covers: (1) the application of artificial intelligence technology to enhance production efficiency and product

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2754-1169/86/20240948

quality at ZARA; (2) leveraging artificial intelligence to optimize supply chain management and minimize inventory risks for ZARA; (3) utilizing artificial intelligence to enhance customer shopping experience and increase user engagement. Through case studies, this paper analyzes the operational innovation within the fast fashion industry and examines ZARA's successful experiences, sheds light on the role of technology in driving operational innovation. The paper also deeply explores the operational mode of the fast fashion industry under the influence of technology, and further investigates the significance of technology for other industries. By examining ZARA's innovative operations, it uncovers the crucial role of AI in enterprise operations and its impact on creating value for enterprises. This research aims to provide guidance for enterprise managers, decision makers, and scholars involved in relevant research, as well as to encourage enterprises to better understand and utilize scientific and technological methods to drive new momentum for development.

2. The application of AI in the fast fashion industry, taking ZARA as an example

2.1. Fast fashion and ZARA's operational innovation

2.1.1. Fast Fashion Overview

The fast fashion industry is a rapidly changing field on a global scale, and every link from design to production to sales requires efficient operations and flexible innovation. The fashion industry is an economic and social powerhouse that employs millions of people worldwide, yet it is a paradoxical industry. Contemporary customers change their product preferences rapidly and are inclined to purchase only what they need or want. In response, the companies need to increase their product variety to improve market share and remain globally competitive [1]. As a leader in the fast fashion industry, ZARA's successful operating model and continuous innovation ability have attracted much attention. Fast fashion figures among the most lucrative using industries of the modern economies.With $25 billion annual sales in 2018, Zara that pioneered fast-fashion art has achieved an outstanding rapid surge,conquering 96 markets worldwide [2]. "Fast Fashion" and Zara are now almost synonymous. No doubt the Zara model is a good one: continuous flow of cutting-edge fashion keeps the consumer frequenting the store; small batches keep the "dogs"-aka the styles that don't sell well-from adversely affecting the bottom line; quick collaborative decision making expedites the notoriously laborious product development process; the daily collection of data comes straight from the customer to ensure accurate forecasting; and Zara maintains complete control of the entire supply chain [3].

2.1.2. The development history of ZARA

ZARA's journey demonstrates its determination and ability to continue to expand and enter new markets. In 2019, Zara ranked 29th in Interbrand’s ranking of the best global brands by value, with an estimated US$17,175 billion. Zara belongs to Inditex, a dynamic fashion retailer with eight distinct brands, selling in 202 markets through its online platform and 7,490 physical stores all over the world. In 1975, when Amancio Ortega opened the first Zara store in La Coruna (North West Spain), he intended to provide price-sensitive European consumers with trendy clothes at a lower price than designer clothes. Boosted by this initial success, he radically changed the clothing industry’s design and distribution patterns by creating a new business model, “fast-moving fashion” which was to make him a fortune [4].

As a fast fashion brand, ZARA is known for its keen market awareness and flexible supply chain management, through rapid production and supply models, able to quickly adjust products and inventory to meet consumer demand. From the beginnings of a small store to today's multi-national company with thousands of stores worldwide, ZARA's success is inseparable from its continuous

DOI: 10.54254/2754-1169/86/20240948

innovation and sensitivity to changes in the market. In the retail or, more precisely, fashion industry, companies are adapting their strategies to this new reality where Zara is seen as one of the most successful cases.

2.1.3. ZARA's operating model

The segment requires agile and flexible decision-making techniques to guarantee the companies survival in a high variety environment of products and demand [5]. ZARA's business model is centered around fast fashion and encompasses the following characteristics: (1) Vertical integration: ZARA integrates design, production, and retail operations to effectively manage the supply chain and promptly respond to market demand. (2) Rapid response: ZARA considers quick feedback as its main competitive advantage, and adapts and introduces new products promptly by collecting and analyzing market information, sales data, and fashion trends. (3) Swift turnaround: ZARA mitigates inventory risk by shortening the product design and production cycle to approximately 2 weeks, allowing for rapid adjustments to product mix and inventory based on consumer feedback and market conditions. (4) Limited production runs: ZARA utilizes limited production runs to prevent excess inventory and easily adapt to market demand. (5) On-site manufacturing: Some stores are equipped with workshops and assembly lines for on-site design and production, allowing for more flexible adaptation to local market needs. (6) Regular product updates: Weekly introduction of new styles stimulates consumer interest and boosts customer traffic. Through this operational model, ZARA can quickly respond to market demand, offer innovative fashion products, and maintain close engagement with consumers for success. Online shopping is winning users day by day because now people search for convenience and comfort. However, this behaviour can be different from the different generations, and it is important to know exactly which target it is important to reach and satisfy their desires. This way, fashion companies need to adapt their business and turn it more technological, to make the shopping experience the more enjoyable as possible.

2.2. The application of AI in operational innovation

2.2.1. Application of AI in the fast fashion industry

The application of technology in the fast fashion industry can help enterprises improve the efficiency of the supply chain, provide personalized shopping experiences, reduce production and costs, and better meet the needs of consumers, and promote the sustainable development of the industry. There are numerous specific applications of artificial intelligence within the fast fashion industry.

Machine learning algorithms can be utilized to analyze data from various sources such as fashion magazines, social media, and shopping platforms to predict and identify fashion trends. Additionally, these algorithms can also be used to generate and optimize design sketches and samples based on big data and deep learning technology, thereby reducing the design cycle. Furthermore, image recognition and generation technology can assist designers in gaining inspiration while providing design advice and creative support.

Artificial intelligence algorithms and big data analysis can be utilized to forecast market demand and sales trends, leading to improved inventory management, supply chain planning, and reduced inventory risks and costs. Additionally, intelligent algorithms can be employed for production planning and scheduling, as well as intelligent production arrangements based on order quantity and real-time demand to enhance efficiency and accuracy. Machine learning can also optimize supply chain partnerships for more effective supplier management, partnership processes, and risk management.

When it comes to personalized recommendations and shopping experiences, the recommendation system can offer personalized product suggestions based on the user's purchase history and browsing

DOI: 10.54254/2754-1169/86/20240948

behavior in order to increase customer loyalty and satisfaction; Additionally, by utilizing virtual fitting and intelligent figure customization technology, customers can access virtual fitting and personalized image customization services to enhance their shopping experience; Lastly, chatbots and an intelligent customer service system are employed to address customer issues in real-time, thus improving interactive communication efficiency.

In the realm of data analysis and decision-making support, the application of big data analytics and machine learning algorithms enables a profound understanding of customer behavior and purchasing preferences, thereby offering valuable insights and assistance for marketing strategy development. By leveraging data-driven sales forecasting and demand forecasting, decision-makers can formulate rational inventory management and purchasing plans, enabling swift responses to market fluctuations. Ultimately, the deployment of an AI-powered decision support system facilitates real-time access to market and competitive intelligence, providing decision suggestions to optimize operational management business decisions.

2.2.2. The impact of AI on ZARA's operational innovation

Technology has brought a series of innovations and advantages to ZARA's operations, enabling it to better adapt to market needs and consumer changes, and achieve a fast, flexible and efficient operating model. These innovations have also helped ZARA maintain its competitive edge and become one of the leading brands in the fast fashion industry. On January 8th, Inditex Group, the parent company of fast fashion brand Zara, planned to close all its stores includes Bershka, Pull&Bear and Stradivirus in China at the end of January, leaving only Tmall online stores and other e-commerce channels [6]. The analysis of Zara's digital brand identity was divided into two parts: on the one hand, the communicative aspects of the brand site and the Instagram page were examined to verify the conditions of the digital brand experience, and, on the other hand, the structure and consistency of the brand identity on all three digital platforms were considered [7]. Artificial intelligence has a significant influence on the operational innovation of ZARA, primarily manifested in the following aspects:

Firstly, production planning and scheduling are optimized through machine learning and big data analysis, resulting in reduced construction periods and production costs while enhancing production efficiency. Additionally, real-time monitoring and evaluation of product quality are ensured by employing machine vision and image recognition technology to meet stringent quality standards.

Secondly, artificial intelligence-driven predictive analysis and demand planning accurately anticipate market demands, leading to improved supply chain management that minimizes inventory risks and costs. Intelligent algorithms are implemented for optimizing supplier collaboration as well as logistics management to enhance supply chain responsiveness, accuracy, and accelerate product release cycles. A foremost example is Zara's fast-fashion business model. Its organizational practices facilitate the detection of tacit fashion trends and their conversion into garments for rapid production and store delivery to exploit fleeting trends. Zara continued to create value in this way after launching Zara.com in 2010 and adapting its demand–supply synchronization for the integrated store–online retail model [8]. In order to enhance customer experience and personalize marketing strategies, ZARA utilizes artificial intelligence and machine learning technologies to analyze customers' shopping behaviors and preferences. This allows for tailored product recommendations and customized services. Additionally, AI chatbots and intelligent customer service systems provide immediate support, improving overall satisfaction.

To discern market trends and consumer behavior, big data analytics and machine learning algorithms are employed for data analysis and predictive decision-making. As a clothing and accessories retailer, Zara launches 11,000 designs on store shelves every year. There are over 200 distinct items in a given Zara store with a one-week inventory turnover. A retailing chain like Zara

DOI: 10.54254/2754-1169/86/20240948

usually maintains a wide variety of products at its warehouse, but only displays a much smaller set of products at a given store due to space constraints [9]. This offers data-driven decision support for marketing strategy optimization. Furthermore, AI-based sales forecasting enables accurate inventory management plans while mitigating supply chain risks.

Overall, the impact of artificial intelligence on ZARA's operational innovation is extensive as it enhances production efficiency, streamlines supply chain management, personalizes marketing efforts through data analysis, improves decision-making accuracy with predictive modeling techniques such as demand forecasting. As a result of these advancements in technology adoption by ZARA, there is an increase in brand competitiveness which leads to greater market share opportunities while also opening up new development paths towards digital transformation initiatives that will further improve their operating model over time.

2.2.3. The practice of AI enabling operational innovation and value creation

Technology enables operational innovation and value creation is an important way for enterprises to gain competitive advantage in the digital age. With the power of technology, companies can enable data-driven decision-making, process automation, and innovative products and services to increase brand value and market share through digital marketing and promotion activities.

One approach is to utilize machine learning and data analysis technology for the extraction and examination of historical sales data to forecast future demand patterns. This can assist companies in making more precise decisions regarding supply chain planning and inventory control, preventing excessive stock or shortages, while enhancing operational efficiency and customer satisfaction.

Additionally, AI technology can optimize various aspects of the supply chain such as product procurement, freight management, and logistics. For instance, algorithms and big data analysis are employed to automatically identify bottlenecks or areas of risk within the supply chain, enabling timely adjustments and optimization to improve response speed and efficiency. The implementation of the Internet of Things (IoT), sensors, and artificial intelligence technology enables intelligent management of warehousing and logistics processes. Real-time monitoring coupled with analysis facilitates storage layout optimization, reduction in cargo loss rate, and cost-effective transportation solutions while providing faster and more accurate logistics services.

Machine learning along with deep learning techniques are utilized for comprehensive analysis of customer purchasing behavior as well as preferences to achieve personalized recommendations for marketing purposes. This enhances marketing accuracy and effectiveness while fostering customer loyalty by increasing their willingness to make purchases.

Natural language processing combined with speech recognition capabilities alongside robotics enable intelligent customer service interactions. Along with voice assistants automate customer consultations resulting in improved Intelligent chatbots and efficiency levels as well as enhanced quality experiences for customers.

Through artificial intelligence technology, the after-sales service process is automated and optimized. For example, data analysis and machine learning technologies are used to achieve intelligent fault detection and remote maintenance, improving the efficiency and quality of after-sales service.

Through the above practices, enterprises can achieve operational innovation and value creation, improve operational efficiency, reduce costs, improve product quality, balance supply and demand, and provide personalized service experience, thus enhancing market competitiveness and sustainable development ability.

DOI: 10.54254/2754-1169/86/20240948

3. Conclusion

This paper primarily examines the influence of artificial intelligence on ZARA's operational innovation. This encompasses the effects and implementation of enhancing production efficiency and product quality, optimizing supply chain management and inventory control, improving customer experience and personalized marketing, as well as data analysis and predictive decision-making. Simultaneously, this study aims to deepen comprehension regarding the correlation between technology-driven operational innovation and value creation. It also offers practical guidance for enterprises to effectively utilize scientific and technological methods in their operations while fostering a more scientific and efficient industry development. Chinese costume enterprises which can borrow the successful experience from ZARA and what is impossible to imitate ZARA for aims to propose some constructive suggestions for the development of domestic costume enterprises [10]. Furthermore, investigating the fast fashion sector, provides valuable insights for operational innovation in other industries. The exchange of experiences across different sectors facilitates collaboration among enterprises and promotes the overall healthy growth of the industrial chain.

One of the current limitations of this paper is that the discussion on specific applications may not be comprehensive enough to encompass all possible scenarios and instances of artificial intelligence implementation in the fast fashion industry. Furthermore, only a general overview is provided regarding the impact of ZARA's operational innovation, without offering specific examples or supporting data. To address these shortcomings, it would be beneficial to include more detailed application cases that expand upon the specific fields where artificial intelligence can be applied in the fast fashion industry. This will provide readers with practical examples and data support, enhancing their understanding of how artificial intelligence is utilized in this sector. In terms of future research directions, there are numerous aspects worth exploring within artificial intelligence in fast fashion. For instance, one area could focus on strengthening fashion creative co-creation by investigating how artificial intelligence technology can facilitate collaborative creativity through methods like generating innovative ideas based on big data and deep learning or developing intelligent design tools for assistance.

References

[1] *Marzieh Mehrjoo, Zbigniew J. Pasek. (2014) Impact of Product Variety on Supply Chain in Fast Fashion Apparel Industry [C]. //47th CIRP Conference on Manufacturing Systems (CMS 2014): Managing Variety in Manufacturing : Windsor, Canada, 28-30 April 2014, Elsevier B.V., 296-301.*

[2] *N. Berbiche, M. Hlyal, J. El Alarm. (2021) Exponential success through integrated supply chain optimization, ecomotional intelligence and reputation-based leadership:Zara model [C]. //7th International Conference on Intelligent Textiles & Mass Customisation: ITMC 2019 : Marrakech, Morocco, 13-15 November 2019, Institute of Physics, pp.319-324.*

[3] *Kim Anderson. (2008) Alternative Strategies to the ZARA Fast Fashion Model [J]. AATCC review: International magazine for textile professionals, 8(4):33.*

[4] *Roederer C., Mayrhofer U. (2021) Zara: Managing the global supply chain successfully [Internet]. France, Europe: HAL CCSD; [cited 2024 Mar 19]. Available from: https://search.ebscohost.com/login.aspx?direct=true&AuthType=sso&db=edsbas&AN=edsbas.F557BC7B&site=eds-live&scope=site*

[5] *Dos Santos, Carlos Henrique, Gabriel, Gustavo Teodoro, Do Amaral, Joao Victor Soares, et al. (2021) Decision-making in a fast fashion company in the Industry 4.0 era: a Digital Twin proposal to support operational planning [J]. The International Journal of Advanced Manufacturing Technology, 116(5/6):1653-1666. DOI:10.1007/s00170-021-07543-z.*

[6] *Mengxia Zhong. (2021) Keeping e-commerce, Zara physical store closure plan fully opened .[J] China Textile (English), (1):44. DOI:10.3969/j.issn.1673-1468.2021.01.017.*

[7] *Tőkés GE. (2022) The Digital Brand Identity of Fast-Fashion Brand Zara. A Case Study. Acta Universitatis Sapientiae - Social Analysis [Internet]. [cited 2024 Mar 19];12(1):131–54. Available from:*

DOI: 10.54254/2754-1169/86/20240948

https://search.ebscohost.com/login.aspx?direct=true&AuthType=sso&db=sih&AN=160276887&site=eds-live&scope=site

[8] Phadnis SS. (2024) Creating Value Through Supply Chain Orchestration as a Business Model. Academy of Management Perspectives [Internet]. Feb [cited 2024 Mar 19];38(1):1–22. Available from: https://search.ebscohost.com/login.aspx?direct=true&AuthType=sso&db=bth&AN=175673729&site=eds-live&scope=site

[9] Shasha Lu, Li Xiao, Min Ding. (2015) A Vicleo-Based Garment Recommendation Model[C]. //AMA Winter Marketing Educators Conference 2015: marketing in a global, digital and connected world : San Antonio, Texas, USA, 13-15 February, American Marketing Association, 2015.

[10] Qinghua Zhang. (2008) Analysis on the Successful Case of Efficient Supply Chain in ZARA [C]. //The 4th International Conference on Wireless Communications, Networking and Mobile Computing, Memoir, pp.1-4.