

Causal factors of e-commerce success affecting the retail performance in online sales business

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Abstract: The online sales business has significant potential for expansion, driving innovation and economic growth through e-commerce. However, challenges persist in online sales, such as a lack of market analysis, disorganized product delivery, failure to update product listings in real time, insufficient after-sales service, and price undercutting by competitors. These issues can negatively impact customer satisfaction, brand reputation, and overall retail performance. The objectives of this research study were: 1) to study the causal factors affecting e-commerce success and retail performance in the online sales business, 2) to study the influence of causal factors of e-commerce success affecting retail performance in the online sales business, and 3) to develop a model of the causal factors of e-commerce success affecting retail performance in the online sales business. A researcher collected data from interviews and online questionnaires with the cosmetic business, from July 2024 to September 2024, by collecting a sample of 560 people. The results of the analysis concluded that social media integration affected e-commerce success, social media integration affected retail performance through e-commerce success, distribution management affected e-commerce success, distribution management affected retail performance through e-commerce success, content marketing affected e-commerce success, content marketing affected retail performance through e-commerce success, and e-commerce success affected retail performance. The online sales business can develop a plan in areas such as social media integration, distribution management, and content marketing to ensure that the business can identify the success of e-commerce and retail performance. Additionally, it enables the business to meet its own needs and carry out the decision-making process for making purchases effectively.

Keywords: Content marketing, Distribution management, E-commerce success, Retail performance, Social media integration.

1. Introduction

Online sales businesses have expanded in various sectors, significantly changing the global economy and consumer behavior. In Thailand, the online sales business has been continuously growing, largely due to the increasing number of internet users and advancements in technology, which are key factors driving the rapid growth of online sales. However, challenges that can impact businesses include issues such as not analyzing the market, inefficient product delivery systems, failure to update products in real-time, lack of after-sales service, or price cuts by competitors. Given the problems and the importance of these issues mentioned above, this is the main reason the researcher is interested in studying and conducting research on this topic, especially focusing on the variables that affect the success of e-commerce. The research includes studies by Martin and Matlay [1]; Ha and Stoel [2]; Hansen and Jensen [3]; Chen, et al. [4]; Li and Wu [5]; Jain and Sharma [6]; Brown [7]; Gefen and Pavlou [8]; De Kerviler, et al. [9] and Shi and Jiang [10].

The researcher collected data from online sales businesses by categorizing them into the following types: 1) e-commerce websites, 2) advertising websites, 3) news websites, 4) blogs, and 5) classified advertising websites. The data was gathered through interviews and online questionnaires from online sales businesses between September 2024 and November 2024. The qualitative population was the online sales businesses, with a sample size of 5, categorized by the types of online sales businesses. The quantitative population was the online sales businesses, with a sample size of 580, based on calculations for data analysis using structural equation modeling techniques.

The expected benefits are that online sales business operators will be able to develop plans in areas such as social media integration, distribution management, and content marketing, allowing them to identify the factors contributing to e-commerce success and retail performance. This will also help them respond to their own needs and make informed purchasing decisions.

This research article presents a study developed from systems theory, investigating empirical variables that influence e-commerce success and retail performance. The researcher believes that the findings of this study will be important for online sales businesses, as well as for academic benefits such as scholars, researchers, and students, who can use the results from this empirical study to develop further integration and academic studies.

2. Research Objective

- 1) To study the causal factors that influence e-commerce success and retail performance in online sales businesses.
- 2) To investigate the impact of causal factors of e-commerce success that affects retail performance in online sales businesses.
- 3) To develop a model of causal factors for e-commerce success that affect retail performance in online sales businesses.

3. Literature Review

The concepts and theories used in this research cover social media integration, logistics and distribution, content marketing, e-commerce success, and retail performance, as discussed in the background and significance of the problem. These concepts serve as variables for defining the framework of the study. The relationships between the variables are examined as follows:

Hypothesis 1: The relationship between Social Media Integration affects E-Commerce Success

Mapanje [11] evaluated the impact of social media integration on consumer decision-making on e-commerce platforms in Malawi.

Yan [12] examined the biological relationship between social media platforms and cross-border E-Commerce Success, as well as the opportunities and challenges in cross-border e-commerce operations.

Hypothesis 2: The relationship between Social Media Integration affects Retail Performance through E-Commerce Success

Hanaysha, et al. [13] focused on investigating how elements of social media advertising (entertainment, relevance perception, interaction, and information) affect brand value and brand experience in the context of retail.

Potter and Stilinski [14] studied how fashion brands can use targeting strategies on social media to tailor marketing campaigns and influence consumer behavior.

Woo, et al. [15] investigated the perceptions, trust, and level of intention of Small Business Owners (SBOs) for social media integration, as well as the relationship between these variables.

Hypothesis 3: The relationship between Distribution Management affects E-Commerce Success

Qi, et al. [16] explored the dynamic relationship between cross-border e-commerce and joint logistics development strategies within the context of small and medium-sized enterprises (SMEs) in China.

Sustan and Arslan [17] delved into the challenges of last-mile delivery exacerbated by the growing e-commerce industry.

Yanginlar, et al. [18] considered whether e-commerce marketing capabilities influence company performance and the role of Logistics 4.0 in this relationship.

Hypothesis 4: The relationship between Distribution Management affects Retail Performance through E-Commerce Success

Feng, et al. [19] explored modern logistics innovations and challenges in the new retail era, driven by the rapid development of science and technology.

Kumar, et al. [20] stated that in this ever-changing landscape, e-commerce retailers are innovating relentlessly.

Li and Wu [5] presented a new multichannel retail model—pre-positioned warehouses—that developed rapidly in China during the COVID-19 pandemic.

Hypothesis 5: The relationship between Content Marketing affects E-Commerce Success

Lazuardi, et al. [21] examined factors influencing E-Commerce Success, focusing on digital marketing and product diversification as independent variables.

Bataineh, et al. [22] analyzed marketing in the context of e-commerce in Jordan, with in-depth analysis of various algorithms and wide usage.

Tan, et al. [23] investigated the impact of content marketing strategies on customer engagement in online fashion stores in Malaysia, presenting effective content marketing strategies for retailers to attract customers.

Hypothesis 6: The relationship between Content Marketing affects Retail Performance through E-Commerce Success

Karpushkin [24] created a retail marketing approach using big data from user-generated content. This predictive approach aims to forecast consumer behavior by developing methods to predict consumer behavior based on changes in content quality.

Haryono and Nurlaela [25] stated that several factors contribute to the rapid development of online sales businesses in Indonesia, with increasing numbers of e-commerce users.

Tan, et al. [23] examined the impact of content marketing strategies on customer engagement in online fashion stores in Malaysia, presenting effective content marketing strategies for retailers to attract customers.

Hypothesis 7: The relationship between E-Commerce Success affects Retail Performance

Wang [26] examined the impact of E-Commerce Success on the offline retail industry, considering both the challenges and opportunities it presents. The research utilized various sources, including industry reports and academic literature.

Ranjan [27] investigated how traditional retail industries in India have been impacted by the e-commerce revolution, exploring the challenges traditional stores face in competing with online giants.

Sayyad and Jadhao [28] suggested that integrating e-commerce platforms with local retail businesses demonstrates significant changes in the retail landscape.

4. Research Framework

This research is a mixed-method study employing both qualitative and quantitative approaches. The researcher has developed the research framework based on systems theory. The framework consists of four key components: (1) Input, (2) Process, (3) Output, and (4) Feedback, which can be explained as follows:

(1) Input refers to social media integration, which includes six components: 1) platform presence, 2) consistency, 3) engagement metrics, 4) follower growth, 5) content quality, and 6) brand consistency. distribution management includes six components: 1) inventory management, 2) order processing, 3) warehousing, 4) transportation, 5) materials handling, and 6) logistical packaging. content marketing includes five components: 1) traffic metrics, 2) lead generation, 3) brand awareness, 4) search engine optimization, and 5) content governance.

(2) Process refers to e-commerce success, which consists of six components: 1) conversion rate, 2) lifetime value, 3) customer retention, 4) operational efficiency, 5) marketplace positioning, and 6) website traffic.

(3) Output refers to retail performance, consisting of six components: 1) sales volume, 2) customer loyalty, 3) e-commerce efficiency, 4) promotional effectiveness, 5) market share, and 6) profitability.

(4) Feedback refers to the retail performance, which, as an output factor, has a feedback effect on social media integration, distribution management, and content marketing.

These four components are interconnected and essential. Any changes to one component will directly affect the others. A deficiency or error in one component will lead to a deficiency in the other components as well. The details are as follows:

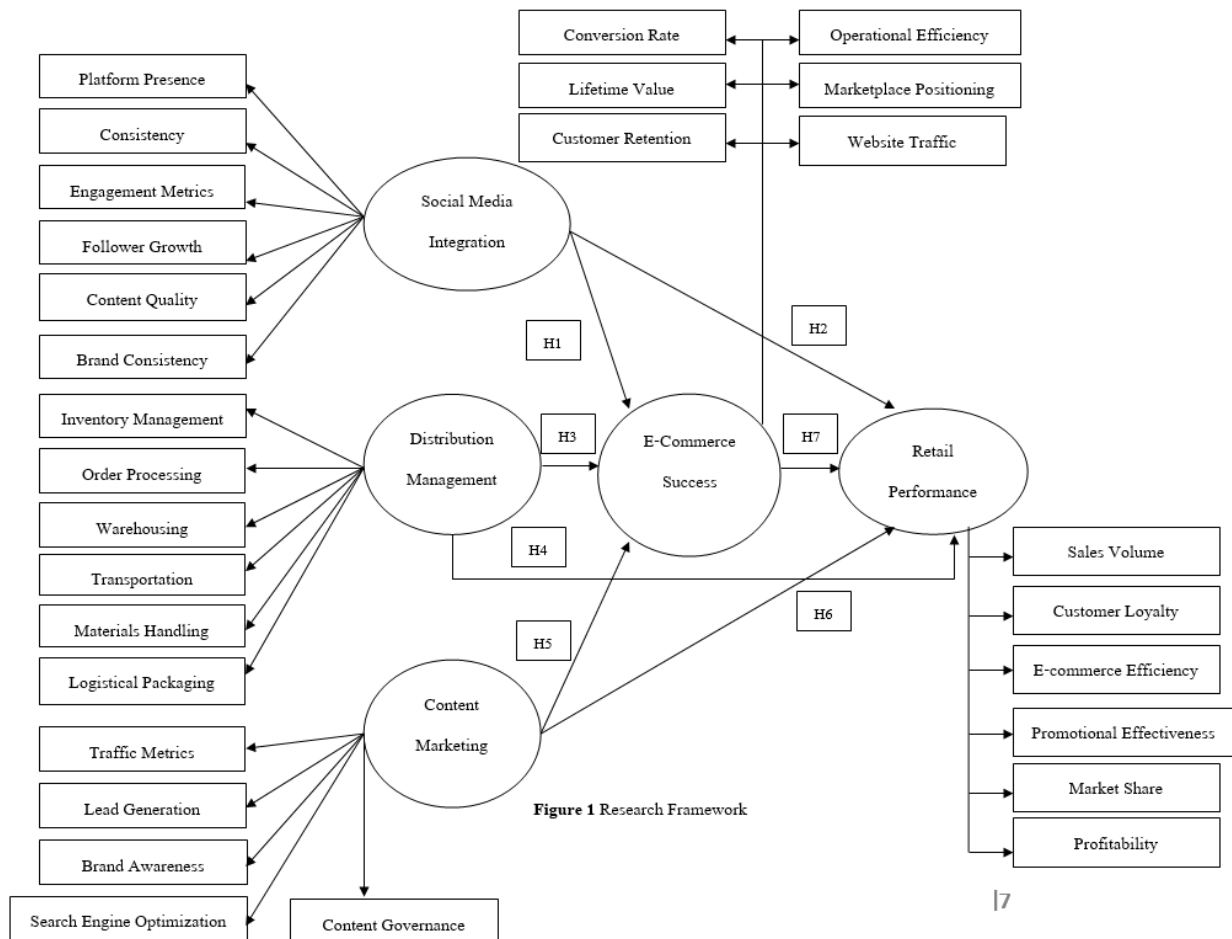


Figure 1.
Research Framework

5. Research Methodology

This research is a mixed-methods study. The research area involves data collection from online product sales businesses, categorized as follows: 1) e-commerce websites, 2) advertising websites, 3) news websites, 4) blogs, and 5) classified ads websites.

The population consists of 10,531 online product sales businesses (according to the Verdivska, et al. [29]). The sample group comprises 580 online product sales businesses, selected using the statistical technique of Structural Equation Modelling (SEM). According to the research framework, there are five

latent variables and 29 observed variables. Statisticians recommend that the sample size should be 15 to 20 times the number of observed variables Hair, et al. [30] making the appropriate sample size for the analysis of multiple variables between $15 \times 29 = 435$ and $20 \times 29 = 580$.

The research instruments include two types:

1) Questionnaire:

Section 1: General organizational information of the survey respondents.

Section 2: Social media integration.

Section 3: Distribution management.

Section 4: Content marketing.

Section 5: E-commerce success.

Section 6: Retail performance.

The researcher delivered a draft of the questionnaire to five experts for statistical evaluation. The item-level content validity index (IOC) was calculated at 0.8968, and the reliability test of the research instrument showed a value of 0.8656. These were used to study the causal factors of e-commerce success affecting the retail performance of online product sales businesses.

2) Interview:

The interview questions are as follows:

How do you perceive the overall integration of social media in online product sales businesses? What factors are affected by this?

Do you think online product sales businesses should apply distribution management to evaluate e-commerce success? What factors are impacted by this?

How do you view content marketing in online product sales businesses? What factors are affected by it?

In general, how are social media integration, distribution management, and content marketing related to each other?

Does your organization consider e-commerce success? If so, in what ways?

Do you believe that e-commerce success has a direct impact on retail performance? How so?

In order to change retail performance, which variables do you think have direct and indirect effects? How?

The researcher conducted in-depth interviews from September 2024 to November 2024. The data collected was analyzed and synthesized, then written as descriptive narratives and content analysis (Content Analysis) to develop a model derived from the quantitative approach.

Table 1.
Research Results.

Objective 1	Research Findings
Social Media Integration	Respondents expressed a high level of agreement regarding social media integration overall. When considering each individual aspect, all six factors were rated highly. The respondents showed the highest level of agreement with brand consistency, followed by follower growth, engagement metrics, content quality, consistency, and, lastly, platform presence.
Distribution Management	Respondents also expressed a high level of agreement regarding distribution management overall. When considering each individual factor, one factor was rated the highest, and five factors were rated highly. The highest-rated factor was inventory management, followed by order processing, logistical packaging, empowering engagement metrics, transportation, and lastly, warehousing.
Content Marketing	Respondents expressed a high level of agreement regarding content marketing overall, with all individual aspects also rated highly. The respondents showed the highest level of agreement with content governance, followed by search engine optimization, traffic metrics, brand awareness, and lastly, lead generation.
E-Commerce Success	Respondents expressed the highest level of agreement regarding e-commerce success overall. When considering each individual aspect, two factors were rated the highest, and four factors were rated highly. The highest-rated factors were customer conversion rate and lifetime value, followed by marketplace positioning, website traffic, customer retention, and lastly, operational efficiency.
Retail Performance	Respondents expressed the highest level of agreement regarding retail performance overall. When considering each individual aspect, five factors were rated the highest, and one factor was rated highly. The highest-rated factors were profitability, followed by market share, promotional effectiveness, e-commerce efficiency, customer loyalty, and lastly, sales volume.
Objective 2	Research Findings
Social Media Integration (SCIG)	Has a direct positive influence on E-Commerce Success (ECSC), with a direct influence size of 0.34, which is statistically significant at the 0.01 level.
Social Media Integration (SCIG)	Has a direct positive influence on Retail Performance (RTPF), with a direct influence size of 0.11, which is statistically significant at the 0.05 level.
Distribution Management (DBMM)	Has a direct positive influence on E-Commerce Success (ECSC), with a direct influence size of 0.14, which is statistically significant at the 0.01 level.
Distribution Management (DBMM)	Has a direct positive influence on Retail Performance (RTPF), with a direct influence size of 0.13, which is statistically significant at the 0.05 level.
Content Marketing (CTMK)	Has a direct positive influence on E-Commerce Success (ECSC), with a direct influence size of 0.46, which is statistically significant at the 0.01 level.
Content Marketing (CTMK)	Has a direct positive influence on Retail Performance (RTPF), with a direct influence size of 0.12, which is statistically significant at the 0.05 level.
E-Commerce Success (ECSC)	Has a direct positive influence on Retail Performance (RTPF), with a direct influence size of 0.68, which is statistically significant at the 0.01 level.
Social Media Integration (SCIG), Distribution Management (DBMM), and Content Marketing (CTMK)	Have an indirect positive influence on Retail Performance (RTPF) through E-Commerce Success (ECSC), with indirect influence sizes of 0.23, 0.09, and 0.31, respectively. These indirect influences are statistically significant at the 0.01 and 0.05 levels.

6. Research Findings

Objective 3: The research findings reveal that the model developed from the results of exploratory analysis and synthesis led the researcher to name the model as the E-Commerce Success for Retail Performance Model (ECSR Model).

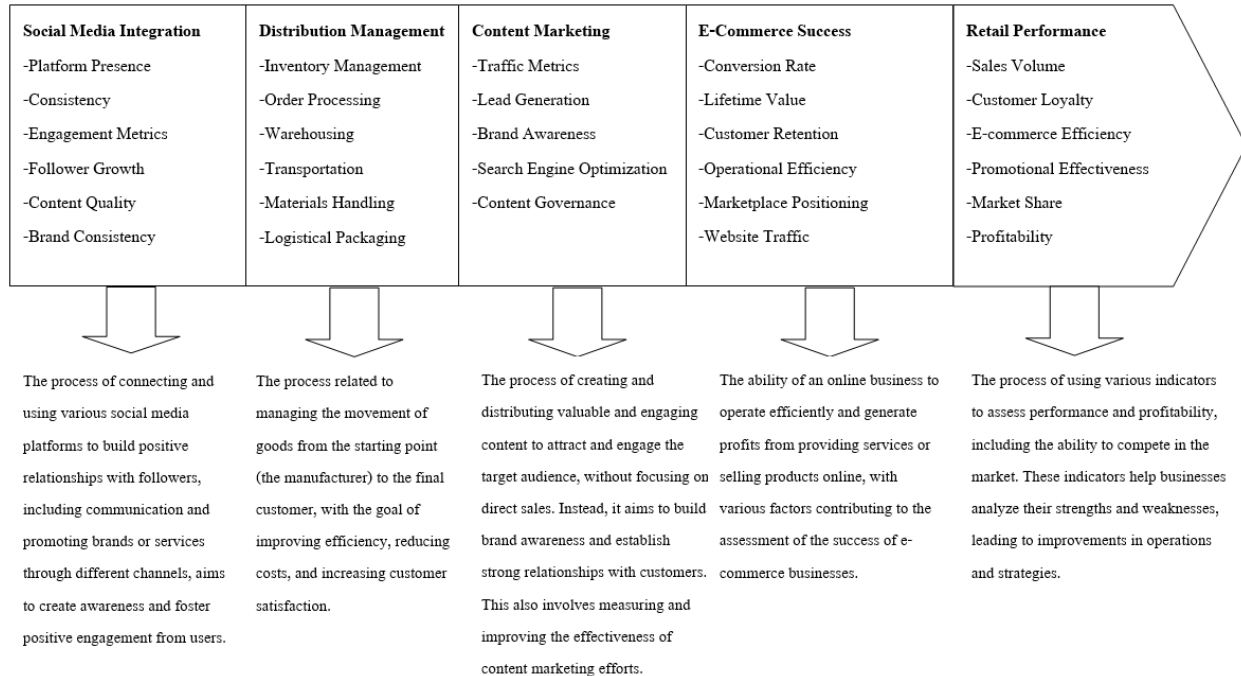


Figure 2.
E-Commerce Success for Retail Performance Model.

7. Discussion

The findings from Objective 1 and 2 reveal that:

- **Social Media Integration and Retail Performance through E-Commerce Success:** The integration of social media into business operations enhances efficiency, such as increasing brand awareness, reaching new customers, building relationships with customers, promoting sales, and boosting consumer engagement. This leads to greater commercial success and market expansion via online channels, aligning with the study by Hanaysha, et al. [13].
- **Supply Chain Management and Retail Performance through E-Commerce Success:** Influencers play a key role in improving e-commerce business performance. They help raise brand awareness, stimulate customer purchase decisions, and increase participation in marketing activities, which in turn enhances retail performance through online channels. Product recommendations or reviews by influencers build customer confidence and interest, boosting sales and e-commerce growth, in line with the study by Feng, et al. [19].
- **Content Marketing and Retail Performance through E-Commerce Success:** Content marketing can effectively promote online retail performance. Product and service promotions via social media increase brand awareness, build product trust, stimulate interest, and boost consumer engagement, ultimately allowing e-commerce businesses to expand their market and increase sales. Furthermore, it helps generate quality purchase decisions from customers, improving online retail performance and contributing to long-term business success, as per the study by Karpushkin [24].
- **E-Commerce Success and Retail Performance:** The success of e-commerce directly impacts retail performance. When e-commerce is successful, it leads to more efficient and better retail operations. Success in e-commerce may include better management systems, the use of appropriate technologies, reaching new customers, and improving business operations online.

All these factors have a direct impact on retail performance, such as increased sales, reduced costs, and online market expansion, which is consistent with the findings of Wang [26].

Research Findings of Objective 3: From in-depth interviews, a causal relationship model for e-commerce success impacting retail performance has been developed.

8. Research Contribution

The findings from this research provide academic insights into the causal factors of e-commerce success that impact retail performance for online sales businesses. The results help to better understand the relationships and impacts between variables related to e-commerce success and retail performance. These findings can be further developed and expanded in academic research, allowing for the application and adaptation of these concepts in other academic fields in the future.

9. Conclusion

The summary of the article is as follows: Online sales businesses have expanded across various sectors, significantly transforming the global economy and consumer behavior. In Thailand, online business is growing continuously, driven by the increasing number of internet users and the advancement of technology in daily life. These factors are key to the rapid growth of online sales businesses.

Some of the challenges faced by online sales businesses include not analyzing the market, inefficient product delivery, delayed product updates, lack of after-sales service, and being undercut by competitors. The analysis concludes that social media integration impacts the success of e-commerce, social media integration affects retail performance through e-commerce success, logistics management influences e-commerce success, logistics management affects retail performance through e-commerce success, content marketing influences e-commerce success, content marketing affects retail performance through e-commerce success, and e-commerce success impacts retail performance.

Online sales businesses can develop plans in areas such as social media integration, logistics management, and content marketing to achieve e-commerce success and enhance retail performance. This will allow them to meet their own needs and improve the decision-making process for customer purchases.

10. Recommendation

In future research, the causal relationship model of E-commerce success affecting retail performance should be tested to verify whether the model aligns with empirical data. Furthermore, the next research should consider additional important factors that contribute to the success of e-commerce and its impact on retail performance. This is because there are still many factors that have not been studied, such as: platform usage that refers to the selection and efficient use of e-commerce platforms (e.g., Shopify, Magento) for transaction management, stock control, and order processing to ensure operational efficiency; content quality that refers to the creation and maintenance of high-quality product descriptions, images, videos, and other content that provides information and attracts customers; search engine optimization (SEO) that refers to techniques used to improve search engine visibility and attract organic traffic to the website; social media and influencer marketing that refers to leveraging social media platforms and influencers to promote products and increase brand visibility within target audiences; mobile optimization that refers to making e-commerce websites fully functional and seamless on mobile devices such as smartphones and tablets; and website user experience (UX) that refers to the design and usability of the website, including easy navigation, a quick checkout process, and an overall positive customer experience; or data analytics that refers to the use of data analysis to understand customer behavior, improve operations, and make informed decisions to enhance e-commerce performance. These factors could be further explored in future studies to provide a more comprehensive understanding of the drivers of e-commerce success and their impact on retail performance.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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References

- [1] J. W. Martin and H. Matlay, "E-commerce and small UK retailers," *Journal of Small Business and Enterprise Development*, vol. 8, no. 4, pp. 330-342, 2001. <https://doi.org/10.1108/EUM000000006485>
- [2] S. Ha and L. Stoel, "Consumer e-shopping acceptance: Antecedents in a technology acceptance model," *Journal of business research*, vol. 62, no. 5, pp. 565-571, 2009.
- [3] T. Hansen and J. M. Jensen, "Online consumer behavior: A review and agenda for future research," *International Journal of Consumer Studies*, vol. 33, no. 6, pp. 714-725, 2009.
- [4] J. Chen, H. Xu, and A. B. Whinston, "Moderating effects of product categories on the relationship between e-commerce and retail performance," *Journal of the Association for Information Systems*, vol. 12, no. 12, pp. 858-883, 2011.
- [5] X. Li and X. Wu, "Understanding e-commerce competition in retail industry: A resource-based view," *Industrial Management & Data Systems*, vol. 11, no. 3, pp. 412-431, 2011.
- [6] V. Jain and A. Sharma, "Impact of e-commerce on retail industry: Opportunities and challenges," *International Journal of Scientific and Research Publications*, vol. 4, no. 12, pp. 1-5, 2014.
- [7] R. Brown, "E-commerce and retail performance: A review and synthesis," *International Journal of Retail & Distribution Management*, vol. 43, no. 3, pp. 126-147, 2015.
- [8] D. Gefen and P. A. Pavlou, "The good, the bad and the ugly of online reviews," *Information Systems Research*, vol. 27, no. 4, pp. 868-888, 2016.
- [9] G. De Kerviler, N. T. Demoulin, and P. Zidda, "Understanding the impact of e-commerce on retail performance: A meta-analysis," *Journal of Retailing and Consumer Services*, vol. 36, pp. 183-197, 2017.
- [10] L. Shi and Z. Jiang, "The impact of social commerce capabilities on online sales performance: The mediating effect of customer relationship management capability and the moderating effect of competition intensity," *Journal of Business Research*, vol. 82, pp. 252-262, 2018. <https://doi.org/10.1016/j.jbusres.2017.08.026>
- [11] E. Mapanje, "Impact of social media usage on consumer decision-making in e-commerce platforms in Malawi," *International Journal of Marketing Strategies*, vol. 6, no. 2, pp. 1-12, 2024.
- [12] Y. Yan, "The impact of e-commerce and social media personalized recommendations on consumer behavior in the digital era from the perspective of behavioral economics," *Advances in Economics, Management and Political Sciences*, vol. 59, pp. 300-305, 2024.
- [13] J. R. Hanaysha, A. Sharma, F. B. Shriedeh, and M. Majid, "Investigating the impact of social media advertising features on brand equity and brand experience in the retail industry," *Journal of Content, Community and Communication*, vol. 17, pp. 190-202, 2023.
- [14] K. Potter and D. Stilinski, "Social media targeting strategies for personalized marketing in the fashion retail industry," *Ladoke Akintola University of Technology & University of Northern Iowa*, 2024.
- [15] H. Woo, W.-S. Kwon, A. Sadachar, Z. Tong, and J. Yang, "Small retail businesses' social media adoption amid a crisis," *Industrial Management & Data Systems*, vol. 124, no. 3, pp. 1299-1325, 2024.
- [16] X. Qi, W. Qin, and B. Lin, "Case study on synergistic development strategy of cross-border e-commerce and logistics: An empirically model estimation," *Plos one*, vol. 19, no. 6, p. e0304393, 2024.
- [17] S. Sustan and Y. Arslan, "Parcel lockers as an environmentally-friendly delivery method in e-commerce: The case of Turkey," in *Globalized Consumer Insights in the Digital Era*: IGI Global, 2024, pp. 110-126.
- [18] G. Yanginlar, M. E. Civelek, I. Bahçeci, and M. Obrecht, "The mediating role of logistics 4.0 capability on the relationship between e-commerce marketing and firm performance," *Polish Journal of Management Studies*, vol. 29, pp. 433-452, 2024.
- [19] T. Feng *et al.*, "How Far Are We From AGI: Are LLMs All We Need?," *arXiv preprint arXiv:2405.10313*, 2024.
- [20] J. Kumar, A. Ansari, and M. Altaf, "Pathways to Sustainable E-Commerce in India: Challenges and Opportunities," *The Pinnacle Research Journal of Scientific and Management Sciences*, vol. 1, no. 1, pp. 8-15, 2024.
- [21] D. Lazuardi, M. Rinaldi, and S. Shinta, "Analysis of the influence of digital marketing and product diversity on the success of e-commerce business," *Outline Journal of Management and Accounting*, vol. 2, no. 2, pp. 6-15, 2023.
- [22] A. Bataineh, I. Abu-ALSondos, R. Frangieh, A. Salameh, and I. Alnajjar, "Predictive modeling in marketing analytics: a comparative study of algorithms and applications in e-commerce sector," *Kurdish Studies*, vol. 12, no. 1, pp. 514-530, 2024.

- [23] P. L. Tan, T. P. Kiong, and R. B. Ahmad, "The impact of digital content marketing on customer engagement in an online fashion store," *International Journal of Advanced Business Studies*, vol. 3, no. 1, pp. 107-123, 2024.
- [24] G. Karpushkin, "Predicting consumer behavior based on big data of user-generated online content in retail marketing," *Global Journal of Flexible Systems Management*, vol. 25, no. 1, pp. 163-178, 2024.
- [25] S. Haryono and N. Nurlaela, "The influence of business with content ecommerce on retail business to the aspect marketing of micro small medium in Depok," *The International Journal of Business Review (The Jobs Review)*, vol. 1, no. 1, pp. 1-8, 2018.
- [26] T. Wang, "Research on the Impact of E-commerce on Offline Retail Industry," *Frontiers in Business, Economics and Management*, vol. 10, no. 1, pp. 169-173, 2023.
- [27] S. Ranjan, "The impact of e-commerce on traditional retail model in India," *International Journal of Scientific Research in Engineering and Management*, vol. 8, no. 4, pp. 1-5, 2024.
- [28] A. Sayyad and P. Jadhao, "Empowering local retail: Leveraging e-commerce for small businesses," *International Journal for Research in Applied Science and Engineering Technology*, vol. 8, no. 4, pp. 1-5, 2024.
- [29] L. Verbivska, O. Zhuk, O. Ievsieieva, T. Kuchmiiova, and V. Saienko, "The role of e-commerce in stimulating innovative business development in the conditions of European integration," *Financial and Credit Activity-Problems of Theory and Practice*, vol. 3, no. 50, pp. 330-340, 2023.
- [30] J. Hair, W. Black, B. Babin, R. Anderson, and R. Tatham, *Multivariate data analysis*, 6th ed. Upper Saddle River: Pearson Prentice Hall, 2006.