



Journal for Social
Science Archives

Journal for Social Science Archives

Online ISSN: 3006-3310

Print ISSN: 3006-3302

Volume 3, Number 2, 2025, Pages 606 – 620

Journal Home Page

<https://jssarchives.com/index.php/Journal/about>



Artificial Intelligence in E-Commerce: A Comparative Study of AI-Driven Innovations in Amazon and Daraz within the Pakistani Market

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ARTICLE INFO

Article History:

Received:	April	05, 2025
Revised:	May	15, 2025
Accepted:	May	18, 2025
Available Online:	May	27, 2025

Keywords:

Artificial intelligence, Customer experience, Fraud detection, Business operations, Supply chain management, E-commerce.

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ABSTRACT

The study investigates the strong influence of artificial intelligence on reshaping the e-commerce platform in Pakistan. The global e-commerce industries use several artificial techniques to promote their business for profitability. This research paper explores a comparative analysis of the global leading e-commerce website Amazon and the local South Asian website Daraz. The study also attempts to analyze the level of AI utilization tools in customer experience, streamlining business operations, fraud detection, and supply chain management. By using convenience sampling techniques, 400 questionnaires were distributed, out of which 345 were received back. Only 315 responses were deemed valid for analysis. The study analyzed the data analyzed with SmartPLS. The study findings underscore that the strategic deployment of AI tools across customer engagement, operational streamlining, fraud mitigation, and supply chain optimization have a profound and significant impact on Daraz's e-commerce performance. Furthermore, this research also recommended that Daraz enhance the usage level of artificial intelligence techniques in their business activities, transforming the business model to increase profitability and take a step into a global e-commerce platform.



Introduction

Artificial intelligence (AI) has emerged as a transformative force across various industries, revolutionizing how businesses operate by improving efficiency, decision-making, and profitability (Mohammed & Madhumithaa, 2024). In the e-commerce sector, AI has played a pivotal role in reshaping online retail platforms through data-driven technologies (Raji et al., 2024). By analyzing vast amounts of consumer data, AI enables personalized recommendations, targeted advertising, and customized user experiences, significantly influencing consumer behavior and satisfaction (Gkikas & Theodoridis, 2021; Vashishth et al., 2024). AI tools help guide customers by analyzing their browsing patterns, purchase histories, and preferences, thereby enhancing engagement and conversion rates (Vashishth et al., 2024).

World's biggest technology companies, such as Google, Microsoft, Amazon, and OpenAI, have spent a large amount of money on AI research. These companies have created AI-based products and services, such as chatbots Kelly (2014) and language model Bouschery et al. (2023) and AI clouds Jacobides et al. (2021) that influence business activities and innovation (Rikap, 2024). The conglomerates of big tech and AI are centralizing AI R&D, with labs clustered in places such as the San Francisco Bay Area and Seattle (Heston & Zwetsloot, 2020). Additionally, the architecture and mechanism of AI recommender systems has been shown to affect the diversity of product sales and create challenges for evaluation because of the dynamic nature of user interest (Zhang et al., 2021).

Leading e-commerce platforms like Amazon and Alibaba have capitalized on AI to strengthen their competitive advantage. They utilize AI in areas such as supply chain optimization, logistics, fraud detection, and customer service. In 2023, Amazon's revenue reached \$574.78 billion with a market capitalization of \$1.879 trillion, while Alibaba improved logistics efficiency through smart supply chain systems (Qiu). In Europe and Asia, countries like the UK, Germany, Japan, and China are at the forefront of AI adoption in e-commerce, applying technologies such as machine learning and facial recognition (Xue & Te Chuan, 2024).

In the context of Pakistan, AI integration is gaining momentum across both public and private sectors. Government initiatives have emphasized AI policy development, education, research, and infrastructure enhancement (Golra & Khalid). The Futuristic National Security Strategy further advocates for investments in advanced technologies such as AI and quantum computing to address strategic threats (Radanliev, 2025). However, challenges like low digital literacy and limited infrastructure hinder widespread adoption. Nevertheless, AI presents vast opportunities for enhancing public service delivery, industrial efficiency, and e-commerce growth (Mehmood et al., 2024).

This study is dedicated to analyzing the role of AI in Pakistan's e-retail industry with a special comparison between global player Amazon and regional counterpart Daraz. Amazon – setting the bar globally in AI-driven personalization and logistics – faces a major competitor in South Asia serving much of what Daraz calls home, also leveraging AI for customer engagement, fraud reduction, and operational efficiency. This study attempts to measure the impact of AI tools on business performance, consumer satisfaction and profit margin in Pakistan's rising digital economy.

The study fills a significant gap in the literature by examining how e-commerce trends in AI are being adopted by emerging markets such as Pakistan. It aspires to enrich the academic debate and to generate food for thought for policymakers, businesses and entrepreneurs. The results will

emphasize the significance of AI in enhancing competitive position, service quality, and sustainable economic growth in Pakistan's e-commerce.

Amid the increasingly complicated state of online consumer behavior, and digital competition, AI solutions make it possible to simplify user navigation, improve product searches and personalize online shopping experiences (Mahmood, 2024). Such AI driven systems are even more important in markets such as Pakistan, where customers often get lost as they navigate through huge product lists. Right search tools and recommendations can greatly optimize user satisfaction and conversion rate (Shahzad, 2024).

This research will explore the adoption of AI applications in functional areas of Daraz, customer engagement through chatbots, fraud detection system, automatic supply chain control and real-time inventory control. Evidence should justify that AI is helping Daraz achieve its strategic objectives and is enabling it to compete in global e-commerce.

The study is organized as follows: Section 2 provides literature review of the studies conducted on AI in e-commerce, Section 3 introduces the theoretical framework and research methodology, Section 4 presents the data analysis and findings, and Section 5 provides concluding remarks and recommendations for policy to enhance AI uptake and digital infrastructure in the e-commerce sector in Pakistan.

2. Literature Review

2.1 Theoretical framework

2.1.1 Technology-Organization-Environment (TOE) Framework

The Technology-Organization-Environment (TOE) framework offers a holistic approach to understanding the process by which technology is adopted by organizations, by considering the three key dimensions of technology, organization, and environment (Akram, 2024). On the Daraz side, the technology piece would be a focus on the tooling around automation, personalization algorithms, fraud detection and operational optimization tools that we have built. The structural dimension concerns Daraz's internal resources, including its structure, managerial with devoid of digital mindset and direction of digital. The environmental factor includes elements outside firm, such as fierce competition in the world e-commerce market and changing customers' demand (Cheba et al., 2021). Through permeation of AI in different aspects of its business, Daraz evidences the alignment with the TOE framework where technological innovation reaps gains in efficiency, responsiveness, and competitiveness in the international digital marketplace.

E-commerce companies across all verticals are leveraging AI to revolutionize the way they do business, whether it's offering superior customer experience, securing the digital environment, making operations more efficient or streamlining their supply chains (Vashishth et al., 2024). Drawing on the Technology-Organization-Environment (TOE) framework, the current study posits that the antecedents of AI adoption in Daraz operational model are defined by the technological state (AI tools), organizational readiness and environmental conditions (Hoosen). Based on this framework, the following sets of hypotheses are formulated to examine the impact of AI on different business domains in Daraz and its competitive standing in global e-commerce scenarios.

2.2 Hypothesis Development

AI has been imperative to the evolution of the e-commerce ecosystem and ensure that the shopping experiences are more personalized in real-time to reflect the unique tastes and behaviors of each customer (Badghish & Soomro, 2024). With the help of copious amount of customer data – including browsing behavior, purchase history, demographics, and up to real-time indications of interaction, AI-powered applications like machine learning algorithms and natural language processing chatbots and virtual assistants can help platforms like Daraz to adapt the product recommendations and produce personalized content on-the-fly (Kumar et al., 2024). This level of personalization contributes to a smoother, more engaging user journey that will drive customer satisfaction, repeat purchases, and long-term brand loyalty that are critical competitive differentiators in an increasingly crowded and competitive digital space (Rane et al., 2023).

There are also more sophisticated issues related to security and fraud as more and more retail moves to e-commerce. Utilizing AI in fraud detection is key in maintaining the credibility of online transactions (Bello & Olufemi, 2024). Using sophisticated methods such as pattern recognition, anomaly detection, and predictive analytics, these AI systems can recognize suspicious activities and irregular transaction trends, that could go unnoticed when relying on humans only and may occur in real-time (Popoola). These AI-based security measures are used by Daraz to constantly monitor transactional data, detect and eradicate fraudulent attempts in time, as well as take preventive actions to make the shopping experience safe (Muhammad et al., 2023). Not only does this provide for the security of financial information for the customers, but also improves the trustworthiness of the provider platform, which is very vital for the customer retention and reputation management in the digital era (Belanger et al., 2002).

In addition to improving the user experience and protecting transactions, AI makes internal operations more efficient by automating tedious, manual labor like, data entry, stock updates, and other administrative processing. The machine learning capabilities of AI can analyze big data and deliver actionable information to help us make smarter decisions - and put us on the road to increased operational flexibility (Paramesha et al., 2024). Daraz employs the use of AI (Artificial Intelligence) in organizational enhancement, job process management, and employee support allocation, which enhances potential for cost-effective operations, less human intervention, and fast-paced process implementation (Khatun et al., 2025). This is an operational shift that allows us to keep high performance and scalability as we grow our addressable markets through South Asia.

On top, AI disrupts supply chain management, a key playing field for e-commerce success, thanks to the possibility of accurate demand forecasting, efficient inventory management, and smart logistics (Kaul & Khurana, 2022). By capitalizing on AI-based predictive models, visual search technology, blockchain for transparency and real time analytics, Daraz is empowering its supply chain elasticity and responsibility. This technological integration enables the company to respond to market changes very quickly, prevent short or overstock, and also deliver the products to their customers in a timely manner, all of which contribute to great customer satisfaction and market share (Smith, 2024).

Together, these diverse applications of cutting-edge AI solutions demonstrate Daraz's forward-looking investment in the integration of technology throughout their operations. This holistic view is consistent with the Technology-Organization-Environment (TOE) framework that underlines the interconnectedness of three dimensions (technological capabilities, organizational readiness and environmental characteristics) on which successful technology adoption is based (Awa et al., 2017). With this, Daraz is in a good place to use AI as an enabler for sustainable expansion, improved customer experience, and lasting competitive dominance in the global commerce

industry, when it is used to align AI innovations effectively to DSP's operations and external market needs (Asghar, 2024).

Hypothesis Formulation

H1: There is a positive impact of AI-driven customer experience on Daraz activities to compete in global e-commerce platforms.

H2: There is a positive impact of AI-driven supply chain management on Daraz activities to compete with global e-commerce platforms.

H3: There is a positive impact of AI-driven fraud detection on Daraz activities to compete with the global e-commerce platform.

H4: There is a positive impact of AI-driven Streamline business operations on Daraz activities to compete with global e-commerce platforms.

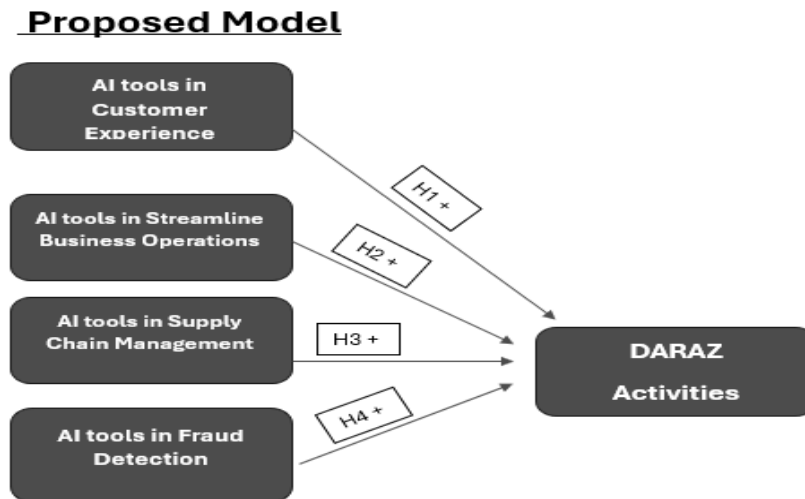


Figure 1: Conceptual Framework

Methodology & Data Collection Method

This research study employed a quantitative approach. The statistical technique for conducting analysis PLS-SEM was employed due to appropriateness to the present study. This PLS-SEM consists of two interconnected models: the measurement model and the structural model (Purwanto & Sudargini, 2021). The measurement model focuses on and ensures that latent variables are measured by their observed indicator. The measurement model explains the reliability and validity of constructions before assessing the relationship between variables in the structural model. The structural model explains the hypothesis relationship between the independent and dependent variables (Andrews, 1984).

400 questionnaires were distributed, out of which 345 were received back. Only 315 responses were deemed valid for analysis. The responses are approximately 86.25% from the distributed questionnaires. Primary data was gathered from 315 valid responses of people of Lahore. Data has been collected from 142 females and 229 males, 120 Daraz employees of four hubs in Lahore (Kareem block hub, Hurbanspura hub, Moazang hub & Johar town hub), 95 online sellers, and 100 full time Daraz customers. 50% of the audience are master's degree holders, 45% are bachelor's &

5% are Intermediate. Data was collected through convenience sampling (Sedgwick, 2013). Data was collected via a closed-ended Data Collection Method through Snowball activity. Data was analyzed via SMARTPLS Software.

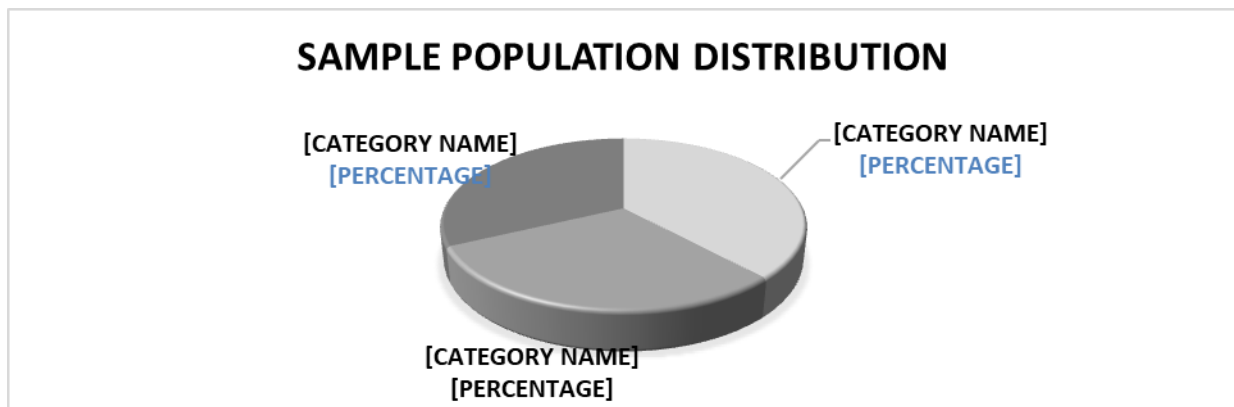


Figure 2: Sample Population Distribution

Figure 2. The pie chart represents the simple population distribution of the study. The distribution consists of three groups Daraz Employees, Online Sellers, and Daraz Full-Time Customers. 38% of questionnaire respondents are Daraz employees which likely provided information relating to internal operations and the impact of AI integration in Daraz activities. 30% questionnaire respondents are online sellers who contribute knowledge about AI integration service, quality, and effects on revenue. 32% of questioners' respondents are Daraz full-time customers who express their purchasing experience and services of Daraz website.

Measurement Model Assessment

The measurement model ensures that latent variables are accurately measured by their observed indicators. Using SMARTPLS Ramayah et al. (2017), validating the measurement model is a crucial step before testing the structural model and hypotheses. This process assesses the reliability and validity of constructs through tests of item and construct reliability, including convergent and discriminant validity.

Data analysis was performed using the PLS-SEM algorithm and bootstrapping in SMARTPLS to evaluate the relationships between four independent variables—supply chain management, customer experience, fraud detection, and streamlined operations—and the dependent variable, Daraz activity. The structural model tests four hypotheses, demonstrating how these predictors significantly influence the efficiency of Daraz's activities.

Reliability refers to the consistency of the measurement instrument, with item reliability assessed through outer loadings and construct reliability measured by Cronbach's alpha (Haji-Othman & Yusuff, 2022). Both exceeded the 0.7 threshold, indicating strong internal consistency. Composite reliability and Average Variance Extracted (AVE) further confirmed reliability, while the Variance Inflation Factor (VIF) was used to check for multicollinearity.

Outer loadings above 0.7 show a strong correlation between items and their underlying constructs, with values ranging from 1.45 to 2.94. The fraud detection construct, especially item FR4 with a loading of 2.731, demonstrated the strongest alignment. Cronbach's alpha scores for key constructs, such as "AI in Supply Chain Management" (0.876), "AI in Streamlining Business Operations" (0.820), and "AI in Customer Experience" (0.806), further confirm high internal

consistency. These results collectively validate the measurement model's reliability and strong convergent validity, indicating that all items effectively measure their intended constructs.

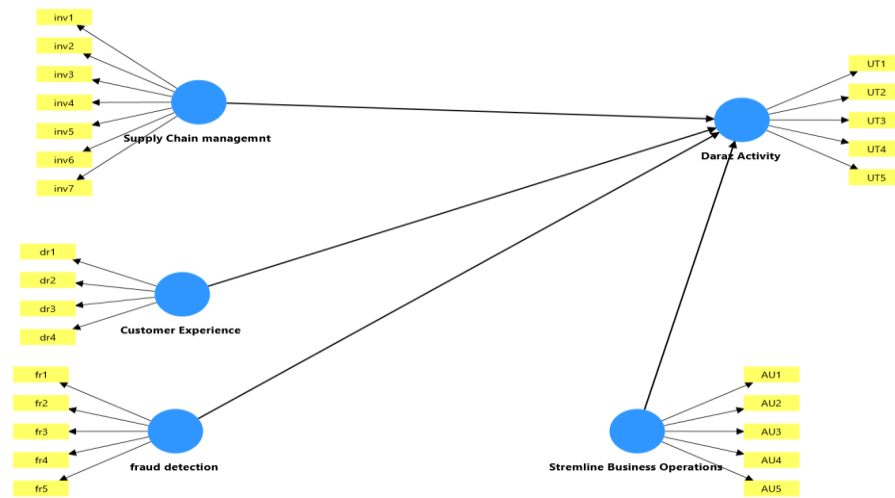


Figure 2: PLS-SEM Model

Table 1: Construct Reliability and Validity

CONSTRUCTS	Items	Outer loadings	Cronbach's alpha
AI In Streamlining Business Operations	AU1	1.997	0.820
	AU2	2.136	
	AU3	1.637	
	AU4	1.989	
	AU5	1.471	
Daraz Activities	UT1	1.796	0.722
	UT2	1.514	
	UT3	1.453	
	UT4	1.910	
	UT5	1.494	
AI In Customer Experience	DR1	1.896	0.806
	DR2	1.781	
	DR3	1.816	
	DR4	1.911	
Ai In Fraud Detection	FR1	2.361	0.906
	FR2	1.746	
	FR3	2.134	
	FR4	2,731	
	FR5	2.520	
Ai In Supply Chain Management	INV1	1.916	0.876
	INV2	2.790	
	INV3	2.397	
	INV4	2.927	
	INV5	1.920	
	INV6	2.171	
	INV7	2.298	

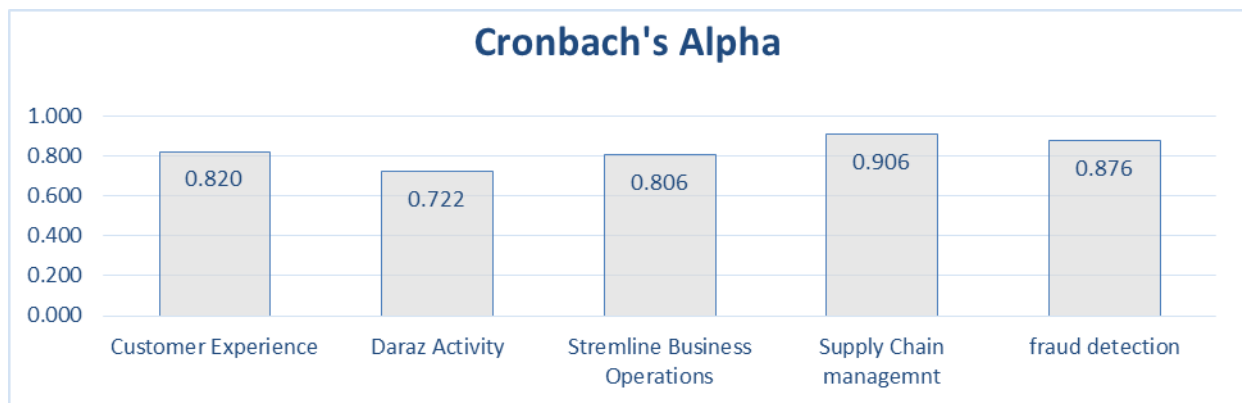


Figure 4: Cronbach's Alpha

Figure 4. The bar chart shows Cronbach alpha values for the five key variables, measuring internal reliability and consistency. Values above 0.70 are acceptable, with higher scores indicating stronger reliability. Supply Chain Management scored 0.906, Fraud Detection 0.876, Streamlining Business Operations 0.806, and Customer Experience 0.820, all indicating high reliability. Daraz Activity scored 0.722, which, while lower, still meets the acceptable threshold, supporting the study's overall reliability.

Table 03 presents the correlation matrix, illustrating the relationships among key business functions within Daraz activities. It highlights the connections between Customer Experience, Daraz Activity, Streamlining Business Operations, Supply Chain Management, and Fraud Detection—factors essential to the company's success and performance.

Supply Chain Management and Customer Experience are critical to any e-commerce platform (Dragomirov, 2020). Daraz Activity shows a strong correlation with Streamlining Business Operations (0.891) and Supply Chain Management (0.770), indicating that efficient operations contribute to successful activities like promotions and sales. Streamlining Business Operations is also strongly correlated with Supply Chain Management (0.892) and Fraud Detection (0.877), suggesting that smooth logistics and fraud prevention enhance overall business efficiency. The correlation between Fraud Detection and Supply Chain Management (0.766) further emphasizes how effective supply chain management helps reduce fraud risks.

The Heterotrait-Monotrait Ratio (HTMT) analysis confirms the validity of the relationships between variables, supporting the use of questionnaire items in further analysis (Yusoff et al., 2020). Customer Experience correlates positively with Supply Chain Management (0.783) and Business Operations (0.751), showing that improvements in these areas enhance customer satisfaction. Similarly, Daraz Activity is linked to Business Operations (0.736) and Supply Chain Management (0.674), reflecting efficient logistics and operations. Fraud Detection also demonstrates strong internal consistency, with significant correlations to Streamlining Business Operations (0.750), indicating that robust fraud prevention supports smoother business processes.

Table 2: Composite Reliability and AVE

Constructs	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Customer Experience	0.836	0.880	0.647
Daraz Activity	0.762	0.809	0.467

Streamline Operations	Business	0.827	0.864	0.562
Supply Management	Chain	0.910	0.926	0.641
Fraud Detection		0.880	0.910	0.669

Table no. 2 represents the results of the measurement of the statistical equation model of composite reliability and average variance

Table 3: Heterotrait-Monotrait ratio (HTMT Ratio): (Discriminant Validity)

Particulars	Customer Experience	Daraz Activity	Streamline Business Operations	Supply Chain Management	Fraud Detection
Customer Experience					
Daraz Activity	0.664				
Streamline Operations	0.913	0.891			
Supply Chain management	0.891	0.77	0.892		
Fraud Detection	0.813	0.755	0.877	0.766	

Table 03 shows the (HTMT) technique used to determine the discriminant validity in structural equation modeling, correlation between different constructs

Table 4: Heterotrait-Monotrait ratio: Fornell- Larcker Criteria)

Particulars	Customer Experience	Daraz Activity	Streamline Business Operations	Supply Chain management	Fraud detection
Customer Experience	0.804				
Daraz Activity	0.573	0.684			
Streamline Business Operations	0.751	0.736	0.749		
Supply Chain management	0.783	0.674	0.773	0.801	
fraud detection	0.699	0.667	0.750	0.690	0.818

Table 5: Path Coefficient

Path Coefficient Table	
Customer Experience -> Daraz Activity	-0.155
fraud detection -> Daraz Activity	0.243
Streamline Business Operations -> Daraz Activity	0.459
Supply Chain management -> Daraz Activity	0.273

The table shows the structural model's path coefficients, indicating the strength and direction of relationships with Daraz Activity. Streamline Business Operations has the strongest positive

impact (0.459), while Customer Experience has a small negative effect (-0.155), suggesting a weak and possibly non-significant influence. Supply Chain Management (0.273) and Fraud Detection (0.243) both show moderate positive effects. Overall, streamlining operations, efficient supply chain management, and fraud detection significantly boost Daraz's performance.

Table 6: Outer loadings bootstrapping

Outer loadings bootstrapping	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
AU1 <- Streamline Business Operations	0.800	0.803	0.043	18.524	0.000
AU2 <- Streamline Business Operations	0.818	0.819	0.048	16.911	0.000
AU3 <- Streamline Business Operations	0.632	0.620	0.106	5.973	0.000
AU4 <- Streamline Business Operations	0.783	0.778	0.077	10.171	0.000
AU5 <- Streamline Business Operations	0.696	0.690	0.075	9.230	0.000
dr1 <- Customer Experience	0.795	0.786	0.064	12.486	0.000
dr2 <- Customer Experience	0.761	0.748	0.088	8.694	0.000
dr3 <- Customer Experience	0.834	0.836	0.043	19.518	0.000
dr4 <- Customer Experience	0.825	0.826	0.044	18.924	0.000
fr1 <- fraud detection	0.837	0.835	0.036	23.194	0.000
fr2 <- fraud detection	0.770	0.765	0.069	11.168	0.000
fr3 <- fraud detection	0.794	0.791	0.050	15.948	0.000
fr4 <- fraud detection	0.852	0.850	0.033	25.696	0.000
fr5 <- fraud detection	0.834	0.833	0.039	21.355	0.000
inv1 <- Supply Chain management	0.756	0.751	0.061	12.485	0.000
inv2 <- Supply Chain management	0.832	0.829	0.041	20.324	0.000
inv3 <- Supply Chain management	0.796	0.794	0.047	16.801	0.000
inv4 <- Supply Chain management	0.858	0.853	0.042	20.200	0.000
inv5 <- Supply Chain management	0.753	0.750	0.057	13.290	0.000
inv6 <- Supply Chain management	0.783	0.779	0.059	13.331	0.000
inv7 <- Supply Chain management	0.820	0.819	0.040	20.334	0.000
UT1 <- Daraz Activity	0.502	0.482	0.150	3.357	0.001
UT2 <- Daraz Activity	0.541	0.522	0.153	3.542	0.000
UT3 <- Daraz Activity	0.744	0.742	0.095	7.850	0.000
UT4 <- Daraz Activity	0.826	0.818	0.056	14.743	0.000
UT5 <- Daraz Activity	0.745	0.747	0.103	7.251	0.000

Table 6, the Outer Loadings Bootstrapping table illustrates measurement model assessment to confirm that all items are statistically significant in (PLS-SEM). The results shows all p-values are 0.000, indicating all items are highly significant at $p < 0.05$. T-values exceed the standard 1.96, confirming 95% confidence in the findings. In Streamline Business Operations, AU3 had the lowest loading at 0.632 with a T-value of 5.973, still within the significant range, while other items (AU1, AU2, AU4, AU5) had higher loadings, showing stronger reliability. Fraud Detection loadings ranged from 0.770 to 0.852, with T-values between 11.168 and 25.696, indicating strong

reliability. Supply Chain Management showed loadings from 0.753 to 0.858 and T-values from 12.485 to 20.334, confirming item reliability.

Collinearity was assessed using Variance Inflation Factor (VIF) values, all below 5 and ranging from 1.453 to 2.927, indicating no multicollinearity issues. The highest VIF was 2.927 (INV4), and the lowest was 1.453 (UT3), all within acceptable limits. Low VIF values suggest stable relationships between indicators, ensuring each provides unique information. Overall, the results confirm strong item reliability and no significant multicollinearity problems.

Discussion & Conclusion

Artificial intelligence plays a cardinal role in the E-retailing marketplace. After understanding the implications of AI transformation in Pakistan's e-commerce industry, specifically, Daraz has significantly important to increased business efficiency, competition, and customer trust (Chowdhury et al., 2025). The purpose of this research study was to explore artificial intelligence appliance impact in multiple dimensions such as customer experience, supply chain management, fraud detection system, and streamlining business operations and to create a theoretical framework that looked at the experiential aspects of AI utilization in the e-commerce industry (Sarma et al., 2020).

The results provide meaningful insight into how artificial intelligence helps to contribute to e-business operational efficiency and performance within the boundary of Pakistan

First, the study found a dynamic relationship between AI integration, adoption, and performance. AI-driven has a strong and positive impact on fraud detection and prevention mechanisms. The model construct measured expressed high reliability and convergent validity. AI integration reduces the losses and builds customer trust, real-time monitoring, and predictive analytics, which is a key factor of success in online business (Rane, 2023). The study findings strongly supported the proposed **hypothesis 04**. There is a positive impact of enhancing AI utilization in streamlining business operations to compete in global e-commerce Platforms (Malhotra & Kharub, 2025).

Second, AI improved the area of supply chain management very effectively (Danach et al., 2024). The consistently high loading values in supply chain management indicate the straight-strength digital transformation. These findings reinforce the high worth of AI in navigating supply chain complexities, particularly in developing economies like Pakistan, where infrastructural and logistical challenges often hinder business performance (Sumbal et al., 2024). The analyzed data also validated **hypothesis 02** there is a positive impact of enhancing AI utilization in the Supply Chain to compete in a global e-commerce platform. Positively Significant and accepted.

Interestingly when it comes to business operations, the relationship between streamlining business operations and AI integration appears to be Multifaceted. Some items were not so strong but even though they were statistically significant, some areas might still need improvement (Ryan, 2011). The study confirms **hypothesis 03**. There is a Positively Significant impact of enhancing AI utilization in Fraud Detection to compete with global e-commerce Platforms (Mehmood, Naseer, & Chen, 2024). Moreover, in customer experience, most measurements show strong results that indicate automated support had a positive effect. AI helps make customers more satisfied and responsive. the research found **hypothesis 01** that there is a strong emphasis the impact of enhancing AI utilization in Customer experience to compete in a global e-commerce Platform (Birch & Cochrane, 2022).

In conclusion, the study's model and analysis confirmed that all statistical measurements used were reliable and valid. The model showed good results, but some items still need more

improvement of AI tools to make sure they continue to meet business goals (Canhoto & Clear, 2020). This study adds valuable insight into how AI can help businesses improve customer service, manage supply chains better, detect fraud, and run more effectively and efficiently. Future research may include more participants from different backgrounds, interviews, or focus groups to make the results more applicable to a wider audience. Conducting a Long-Term Study and collecting data over time can be measured to stay reliable and valid. The addition of new relevant topics like Technology Adoption or User Satisfaction may improve the overall quality of the model. The research study can more reliably remove weaker items or add stronger ones to process the model better and more reliable results. As AI technology grows, Companies that strategically integrate AI into their operations can succeed against competitors in e-industry and succeed in long-term growth (Satish & Rao, 2023).

Limitation

The study examined that the sample size of respondents is small and specific, which means the results may not cover all e-commerce platforms globally. In addition, this research study focused on certain dimensions of AI in business functions such as customer experience, fraud detection, supply chain management, and business operations, and data was collected only from a limited geographic area or a specific demographic group. Some important areas like marketing automation, accounting, data analytics were left over. This can create limitation of findings, especially considering that e-commerce platforms vary greatly in terms of scale, infrastructure, culture, economy, and consumer behavior across different countries. This research also used cross-sectional data which means data was likely collected at one point in time, which poses other limitations and might present an incomplete view of AI's full potential. There is a chance that participant may respond according to his personal experience, misunderstandings, or social desirability rather than objective facts, which could affect the quality, effectiveness and efficiency of the results. Further research is needed to build a more comprehensive and dynamic understanding of AI's role in reshaping global e-commerce platforms.

Moreover, it would be beneficial to involve a larger and more diverse group of participants from different areas, countries, and regions to make the findings more significant and relate to the current practical approach. This study could also examine the additional AI-driven in e-commerce which has a strong influence on gaining a clear picture of AI advancement. Longitudinal research would help to examine the broader role of artificial intelligence. Furthermore, comparing AI's role in various e-commerce platforms such as Amazon, Alibaba, or Daraz could analyze different outcomes and strategies, to understand the broader view of AI's effectiveness in global competition.

Future Direction

Future research on artificial intelligence in e-commerce platform can explore a broader scope. A cross-country comparative analysis will help understand differences in technology, regulatory environments and customer behavior. However, longitudinal studies can explore AI's impact on business efficiency and competition in the market. Additionally, future studies examining AI appliances such as voice shopping, augmented reality shopping, and efficient supply chains help to understand their role in shaping the future of online retail.

Furthermore, quantitative approach methods with the use of expert interviews and focus group discussions and questionnaires can provide a broader scope of the benefits and challenges of AI in e-commerce. Topics like cybersecurity, data privacy, business smart performance in the context of AI should be studied. Future research shows how artificial technology enhances digital literacy in

countries where technology use is still growing. By addressing these aspects, future studies can provide a more holistic understanding relating to AI appliances that will consistently change and improve e-commerce worldwide.

To improve AI-driven expand their investigative scope include research in multiple academic, regions, and industry sources to understand the diversification of global utilization of artificial intelligence. Future research should focus on the ethical concerns of AI and ensure AI is used responsibly. Another promising area for future research is how new technologies like AR, VR, and block chain can improve shopping experiences on e - e-platforms. Lastly, future research should also explore AI techniques in delivery and logistics challenges in developing countries, ensuring that it benefits both businesses and consumers effectively.

With the utilization of artificial intelligence tools, e-commerce businesses should improve both hedonic (enjoyable and engaging) and utilitarian (practical and efficient) service quality that can help personalize shopping experiences, automated checkouts, faster catboats service, augmented reality (AR) and virtual reality (VR) to create more efficient and effective shopping experiences. Additionally, AI-driven sentiment analysis can improve customer engagement, build stronger connections with customers, recommendation, business efficiency, which enables companies to become more profitable, like global giants Amazon, Alibaba, eBay etc.

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