

INTERPLAY OF E-COMMERCE BARRIERS, ADOPTION AND BUSINESS OPPORTUNITIES IN DEVELOPING ECONOMIES: INSIGHTS FROM ZIMBABWE'S PUBLIC POSTAL AND COURIER SERVICES INDUSTRY

Forbes Makudza¹, Ernest Chinyerere²

Abstract

This study investigates the interplay of e-commerce barriers, adoption, and business opportunities by end consumers in the public postal and courier services (PPCS) industry in Zimbabwe. The study employed a comprehensive methodology grounded in key theories such as the perceived risk theory and digital divide theory. Deductive reasoning and the survey method were utilised, whilst the questionnaire was used as the primary data collection tool. A representative sample of 1,031 respondents across urban and rural settings was selected. The study revealed a low e-commerce adoption rate of 3.39% in the PPCS industry in Zimbabwe. Despite a high e-commerce adoption intention, significant barriers such as a lack of awareness, trust issues, and security concerns impede actual usage. Structural equation modelling (SEM) identifies that barriers inversely affect e-commerce adoption intention. The results suggest a robust positive relationship between e-commerce adoption and business opportunities, indicating that addressing these barriers could unlock substantial business opportunities and customer loyalty for the PPCS industry. The research highlights the necessity for strategic interventions aimed at improving the security of online transactions and fostering effective e-commerce engagement.

Keywords: E-commerce, Technology barriers, E-commerce opportunities, Technology adoption, Digital business.

1. INTRODUCTION

In this digital era, e-commerce has emerged as a vital component of global trade, offering businesses innovative avenues to reach customers, enhance operational efficiency, and broaden market access. With the rise of the internet and mobile technology, e-commerce presents a unique opportunity for companies, particularly in developing countries, to leapfrog traditional business models and tap into a global marketplace (Ofori-Sasu, N'guessan & Nanziri, 2024). However, although e-commerce has great potential towards business development, its adoption rates remain low in most emerging economies in Africa, including Zimbabwe (Hendricks & Mwapwele, 2024).

Although Zimbabwe has its own fair share of economic and developmental problems, the environment seems ready for e-commerce usage and adoption. There is a growing interest in digital technologies in Zimbabwe, especially among the youth and young adults. That presents a couple of business opportunities that bank on e-commerce adoption, such as new product development, economic improvement, and enhancement of trade without geographical and physical barriers. Regardless of the many opportunities that e-commerce adoption presents, the adoption levels in Zimbabwe are still very low, and this indicates that there are a number of barriers that inhibit effective use of e-commerce (Makudza & Chinyerere, 2024).

Zimbabwe enhanced its digital infrastructure over the recent year, leading to the number of active online shoppers in Zimbabwe to surge. About 3,5 million individuals were actively buying and selling online by the end of 2025, which represents a 25 per cent year-on-year increase (Gahadza, 2025). Mobile penetration in Zimbabwe reached 102,64 per cent, while the internet penetration rate stood at 81,83 per cent for the second quarter of 2025 (POTRAZ, 2025). However, smartphone penetration rates remained low at about 52% by 2025 (Statista, 2025). Smartphone usage is a key driver of e-commerce adoption, particularly among individuals who lack access to computers for internet browsing (Makudza & Chinyerere, 2024). These statistics present a gradual increase in e-commerce usage, yet they highlight

¹ Lecturer, Department of Business Enterprise and Management, University of Zimbabwe, 630 Churchill Ave, Harare, Zimbabwe, Email: forbesmakudza@gmail.com.

² Lecturer, Department of Finance and Accounting, University of Zimbabwe, 630 Churchill Ave, Harare, Zimbabwe, Email: ernestchinyerere@gmail.com.

gaps in e-commerce adoption. These gaps highlight that some hidden barriers to e-commerce adoption that await exploration.

Therefore, e-commerce adoption in developing economies remains uneven, particularly among public-sector and state-owned enterprises tasked with enabling national logistics and digital trade infrastructure. While digital platforms present significant opportunities for service diversification, revenue growth, and market expansion, their uptake is often constrained by structural, technological, and behavioural barriers. This study contributes to this body of knowledge by examining the interplay between e-commerce barriers, adoption, and emerging business opportunities within a developing economy context, using Zimbabwe's public postal and courier services industry as an empirical case. The industry has responded to declining demand for letter-based communication by introducing several e-commerce-driven innovations, including mobile money services, online mall platforms and e-commerce platforms. However, despite these investments, prior evidence indicates that consumer adoption of the e-commerce services remains low and concerning in this industry (Makudza & Chinyerere, 2024), raising critical questions about the factors inhibiting adoption and the unrealised business opportunities within state-owned digital platforms in developing economies.

The Zimbabwean public postal and courier services industry was selected because it plays a critical public-sector role in facilitating digital trade and inclusive economic participation. The industry is Zimbabwe's national postal operator with an extensive nationwide network, positioning it as a strategic enabler of inclusive e-commerce adoption. Examining e-commerce adoption barriers and opportunities in Zimbabwe's public postal and courier services industry offers relevant insights into challenges facing the industry in supporting national digital transformation agendas. The study further informs strategic business decision-making in the public postal and courier services industry and related cases in tapping into the ever-growing e-commerce market.

The study thus sought to satisfy the following research objectives.

- To examine the e-commerce adoption drivers that affect consumers in Zimbabwe's public postal and courier services industry.
- To examine the relationship between e-commerce adoption drivers and e-commerce adoption.
- To analyse the effect of e-commerce adoption and e-commerce business opportunities.

Subsequently, the following were the research questions of the study:

- What are the e-commerce adoption drivers that affect consumers in Zimbabwe's public postal and courier services industry?
- What is the relationship between e-commerce adoption drivers and e-commerce adoption?
- How does e-commerce adoption affect e-commerce business opportunities?

Using scientific statistical methods, such as structural equation modelling (SEM), helped to quantify the depth and breadth of the barriers, the opportunities and behavioural adoption intention of e-commerce. Ultimately, this study provides a basis on which e-commerce adoption can be modelled in an emerging economic environment, such as Zimbabwe.

2. RELATED WORK

This section reviews extant literature on e-commerce adoption, associated business opportunities, and barriers to adoption, with particular attention to developing economy contexts. It further discusses the theoretical frameworks underpinning the study and presents the conceptual framework guiding the analysis.

2.1. Electronic Commerce

Joshi (2025) states that e-commerce, also known as electronic commerce, refers to the purchase and sale of goods and services through the internet or the web. With the emergence and use of modern technology, there are some activities that qualify under e-commerce and they include retailing, online bidding, and

commercial transactions. These activities can take place through websites, mobile devices, and social networks (Dedi, 2024). The benefits of e-commerce to businesses include enhanced global market accessibility and, to consumers, an increased choice and transparency in pricing (Joshi, 2025). It has been established that the increased use of mobile commerce and social media applications has boosted online shopping, especially among the youth (Makudza, Masaire, Makwara, Sibanda & Machaka, 2024).

2.2 E-commerce adoption

Religia et al (2021) define e-commerce adoption as the period or the stage in which an organisation or an individual starts using electronic means for trading. E-commerce adoption can be affected by factors such as internet access, banking services, and social issues (Hasan & Mardhani, 2021). On the other hand, factors that promote the effective adoption of e-commerce have also been examined in literature, and they include perceived ease of use and perceived usefulness (Makudza & Chinyerere, 2024). Other scholars also identified the role of society and personal technological prowess as other drivers of e-commerce adoption (Bighrissen, 2021).

2.3 E-commerce business opportunities

The opportunities pertaining to e-commerce are abundant. The global e-commerce market growth potential is sufficient to enable traction in areas such as personalised products, subscription services, and eco-friendly goods (Hategan et al, 2021). The growth in social commerce and mobile shopping shows that social media direct sales integration enhances customer relations and increases profits (Makudza, Sandada & Madzikanda, 2021). By focusing on specific emerging niches and developing aggressive e-commerce and customer marketing, an e-commerce business is very likely to prosper. As most of the literature also points out, there are issues like cybersecurity, gaps in logistics, and the fundamentals of e-commerce business that need to be addressed. Profits are prevalent, yet expanding toward e-commerce is a complex process (Hategan et al, 2021).

2.4 Barriers to e-commerce adoption

From the customer's point of view, the convenience of e-commerce has not yet been fully embraced, and a variety of barriers to its adoption are prevalent. Primarily, a lack of knowledge regarding the potential of e-commerce platforms for business is a gap that needs to be filled (Hendricks & Mwapwele, 2024). Many possible customers do not understand the way shopping online functions, the kinds of options that are available, and the convenience of shopping online. This lack of comprehension makes them less willing to consider e-commerce and minimise their participation in the online marketplace (Bighrissen, 2021).

The next important barrier is e-commerce data cost (Hasan & Mardhani, 2021). Internet data in many parts of the world, particularly the less developed parts, is far too costly for many people (Makudza & Chinyerere, 2024). High data costs can impact the willingness of consumers to look at online shops and even make purchases, for fear of paying exorbitantly high prices. This cost hurdle limits the accessibility of e-commerce and possible market growth, even in regions where internet access is freely available. Affordable data plans are needed to increase participation in e-commerce (Hasan & Mardhani, 2021).

The lack of access to required technology also has an impact on the level of e-commerce participation (Ben-Youssef & Dahmani, 2024). Many prospective buyers do not have smartphones, laptops or computers that enable them to access online mobile shopping. This digital divide can result in significant disparities, particularly in rural or economically disadvantaged areas where accessing modern technology is more difficult. Without proper devices, even individuals who are interested in e-commerce may find themselves unable to participate effectively (Hendricks & Mwapwele, 2024).

Some customers fail to embrace e-commerce as a result of resistance to change. In most emerging countries, some consumers still have no e-commerce exposure at all, which leads them to consider traditional methods of shopping as far easier and uncomplicated (Bighrissen 2021). To overcome this barrier, specific education and outreach targeting the marketing of the value and simplicity of internet shopping are necessary.

In e-commerce, the trust of the customer is the most important driver of adoption, with the flip side being true for an e-commerce adoption barrier (Yadav et al., 2022). Concerns about the presence of

online sellers, the offered products, and the services involved in supplying the goods bother a lot of individuals. Such online purchasing anxiety stems from a fear of online scams and getting a product that is not of the expected quality. Effective transparent policies, positive evaluations made by clients, and good service excellence ensure trust, and that trust is vital to overcome the distrust barrier to e-commerce (Yadav et al., 2022).

In addition, the fear of breaches of security relating to online shopping is more serious than ever. Consumers are more concerned about security than ever, and the reasons for this are becoming more transparent (Religia et al., 2022). Issues of online purchase security and fraud protection, potential exposure to the internet, and loss of identity all remain powerful barriers to customers' willingness to participate in e-commerce (Bighrissen, 2021). The fear barrier is closely linked to the inability to use the internet. Some customers, especially the elderly, face the knowledge barrier as they struggle to use the internet, and worse still, to complete an online purchasing transaction (Makudza et al., 2022). Another barrier, which is prevalent in most developing economies, is poor internet connectivity and speed. In most rural and marginalised communities, internet connectivity is poor or beyond reach for many (Yadav et al., 2022).

2.5 The Zimbabwean Context

In Zimbabwe, e-commerce adoption has been shaped by a complex interplay of infrastructural, economic, and institutional factors (Dumbu, Mutongi & Tsokota, 2025). Existing literature highlights persistent challenges such as limited digital infrastructure, high internet and data costs, constrained access to electronic payment systems, and low consumer trust in online transactions, all of which inhibit widespread e-commerce uptake (Chimeri, 2025; Mugijima et al., 2024; Prosper & Simuka, 2022). Studies further note that while mobile penetration is relatively high, the effective use of digital platforms for commercial activities remains uneven, particularly outside major urban centres (Makudza & Chinyerere, 2024). For organisations, especially state-owned and public-sector entities, additional barriers include legacy operational models, limited technological capabilities, and regulatory rigidities, which affect their ability to fully leverage e-commerce for business expansion (Chimeri, 2025). Nonetheless, Mugijima et al. (2024) also identify emerging opportunities linked to mobile money adoption, platform-based service innovation, and growing demand for convenient logistics solutions, suggesting untapped potential for e-commerce-led growth within Zimbabwe's evolving digital economy.

2.6 Theoretical framework of consumer e-commerce adoption barriers

This study adopts a barrier-oriented theoretical lens to explain e-commerce adoption challenges in developing economies, drawing primarily on the Technology–Organisation–Environment (TOE) framework, Perceived Risk Theory, Status Quo Bias Theory, Digital Divide Theory, and Knowledge Gap Theory. Unlike adoption-centric models that emphasise facilitating conditions, these perspectives explicitly foreground structural, behavioural, and contextual constraints that inhibit technology uptake (Hassan et al., 2024). The TOE framework provides an overarching analytical structure by situating e-commerce barriers within technological, organisational, and environmental contexts (Loo, Ramachandran & Raja-Yusof, 2025), making it particularly suitable for examining adoption constraints in state-owned enterprises operating in resource-constrained environments.

According to Naatu, Naatu and Nsubuga (2024), Perceived Risk Theory explains trust and security-related concerns that discourage engagement with e-commerce platforms. In contexts characterised by weak consumer protection mechanisms and low confidence in digital transactions, perceived financial, privacy, and performance risks heighten fear and uncertainty, reinforcing non-adoption behaviours. Complementing this perspective, Status Quo Bias Theory accounts for resistance to change by highlighting users' preference for familiar, established service channels over novel digital alternatives, even when the latter offer potential efficiency gains (Kim & Kankanhalli, 2009). This behavioural inertia is especially pronounced in legacy service environments such as postal systems, where long-standing routines shape consumer expectations and usage patterns.

Structural and capability-related barriers are further illuminated through Digital Divide Theory and Knowledge Gap Theory. Digital Divide Theory explains inequalities in access to digital infrastructure, hardware, connectivity, and skills, which systematically constrain participation in e-commerce ecosystems in developing economies (Azmeah & Foster, 2028). These constraints are not merely

technological but socio-economic, reflecting disparities in income, education, and geographic location. Knowledge Gap Theory complements this by explaining uneven awareness and understanding of e-commerce services, where access to information does not diffuse uniformly across populations (Martinsons, 2008). Together, these theories provide a comprehensive explanation of how informational, infrastructural, and capability deficits interact to suppress e-commerce adoption and limit the realisation of associated business opportunities.

2.7 The conceptual framework

The study's conceptual framework was informed by barrier-oriented theoretical models discussed in the previous section. Table 1 presents the theoretical origin and definition of conceptual framework variables.

Table 1. Theoretical origin and definition of conceptual framework variables

Conceptual Variable	Theoretical Origin	Definition
Lack of awareness	Knowledge Gap Theory	The extent to which potential users have limited knowledge or understanding of the existence, functionality, and benefits of e-commerce platforms.
Trust threats	Perceived Risk Theory	Users' concerns regarding the reliability, credibility, and integrity of e-commerce platforms and service providers.
Security threats	Perceived Risk Theory	Perceived risks related to data privacy, financial security, and protection against fraud in online transactions.
Hardware costs	Digital Divide Theory	Financial constraints are associated with acquiring digital devices necessary for accessing e-commerce services.
Resistance to change	Status Quo Bias Theory	The tendency of users to prefer traditional service channels and routines over adopting new digital alternatives.
Skills deficiency	Digital Divide Theory	Limited digital literacy and technical competence are required to effectively use e-commerce platforms.
Internet inaccessibility	TOE (Environmental context)	Limited or unreliable access to the internet infrastructure necessary for online transactions.
Data costs	Digital Divide Theory / TOE (Environmental context)	High costs of internet data constrain sustained engagement with e-commerce platforms.

Subsequently, Figure 1. Presents the conceptual framework of the study

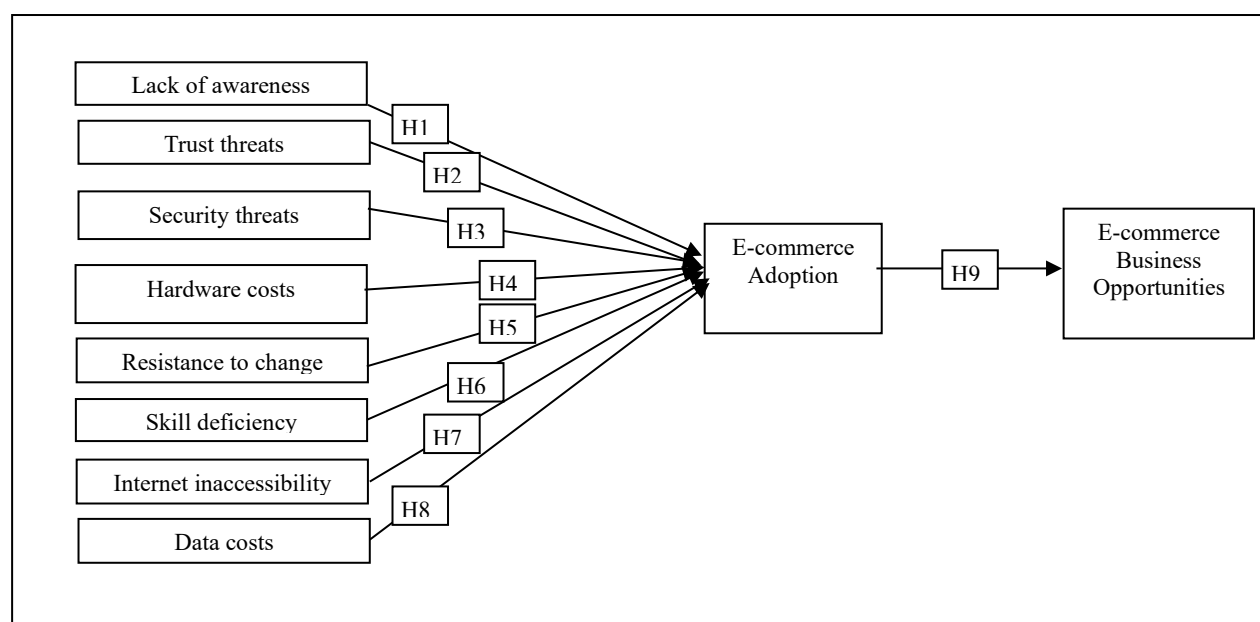


Figure 1. The conceptual framework.

The conceptual framework in Figure 1 depicts the eight hypothesised barriers to e-commerce adoption. These barriers were drawn from previous theories and extant studies. The hypothesised barriers include

a lack of awareness of e-commerce, which may emanate from a lack of exposure or poor marketing communication. Other barriers include security, e-commerce, costly hardware, customers' resistance to change from traditional commerce to e-commerce, e-commerce skills deficiency, barriers with internet accessibility and beyond-reach e-commerce data costs. The conceptual framework suggests that the barriers of e-commerce adoption inhibit effective adoption, yet e-commerce adoption is posited to predict e-commerce business opportunities.

Understanding these barriers can help policymakers and business leaders develop targeted strategies to enhance e-commerce adoption, thereby unlocking its potential for driving economic growth and innovation.

Thus, guided by the conceptual framework, the following hypotheses are presented:

- H₁ Lack of e-commerce awareness inversely relates to e-commerce adoption intention
- H₂ E-commerce distrust inversely relates to e-commerce adoption intention
- H₃ E-commerce security threats inversely relate to e-commerce adoption intention
- H₄ E-commerce hardware costs are inversely related to e-commerce adoption intention
- H₅ E-commerce resistance to change inversely relates to e-commerce adoption intention.
- H₆ E-commerce skill deficiency inversely relates to e-commerce adoption intention.
- H₇ E-commerce internet inaccessibility inversely relates to e-commerce adoption intention.
- H₈ E-commerce data costs inversely relate to e-commerce adoption intention
- H₉ E-commerce adoption has a positive effect on e-commerce business opportunities

3. SOLUTION APPROACH

To investigate the interplay between e-commerce barriers, adoption, and business opportunities, an explanatory research design was employed for the study. The researchers chose the positivist philosophy because it is cost-effective for gathering large volumes of data and enhances the comparison of variables and the inference of the causal relationships. Furthermore, a deductive research approach with quantitative techniques was used because it places more emphasis on testing theories and aids in the establishment of the relationships among e-commerce barriers, adoption, and business opportunities among customers in the public postal and courier services industry. A structured survey consisting of closed-ended questions was utilised to gather data from customers in the public postal and courier services industry in Zimbabwe. The questionnaire standard is trusted, the responses are consistent, it saves time, compared to other data gathering methods, it is simpler, and the opinions it expresses are more grounded in reality. However, enough accuracy was done in the questionnaire's design and development to make the questions clear.

The study targeted customers, both individuals and corporations. Previous experience with e-commerce platforms was not required for participation, as the research aimed to include individuals who had never utilised e-commerce to understand their barriers. The study encompassed both urban and rural populations to ensure a comprehensive nationwide perspective on e-commerce adoption barriers, irrespective of the respondents' background. Purposive sampling that involves both judgmental and quota sampling was used by the researchers. The use of quota sampling tends to include respondents who are easily found and willing to be interviewed. The researchers are given considerable flexibility to exercise their judgment concerning the selection of respondents. Purposive sampling enhances information richness, that is, it enables the researcher to focus on information-rich cases and unique situations. Moreover, when resources are limited, purposive sampling helps to maximise the efficacy of the available data. The country was divided into five geographical regions: Harare, Northern, Manicaland, Central, and Matabeleland. An expected sample size of 1,385 participants was deemed adequate.

Research assistants with at least a bachelor's degree and relevant experience were employed to conduct the survey. After undergoing training, the research assistants and their leaders pretested the questionnaires in Harare. The final study questionnaire was distributed physically across the country. Once data collection was completed, the quantitative data were cleaned and analysed using IBM version 26 and IBM-AMOS. The validity of the questionnaire was evaluated using the Cronbach Alpha test, which indicated that the e-commerce adoption barriers were reliable, as their values exceeded the minimum acceptable threshold of 0.7. To meet the assumption of SEM, the researchers checked for the data distribution in terms of normality and identified outliers to avoid biased estimates. Moreover, a representative sample size was used to come up with reliable estimates. Multicollinearity diagnostic tests were conducted to assess whether there was little or no association between the residuals of the data. Additionally, the model was evaluated using the Chi-square (χ^2) goodness of fit indices.

4. FINDINGS AND RESULTS

A representative response frequency of 1031 responses were obtained and validated. Most of the individual responses were sourced from the Manicaland and Midlands Provinces, while Matabeleland North and South had the lowest representation, at 5.27% and 5.04%, respectively. The differences in provincial representation were attributed to the varying levels of respondent engagement across provinces during the data collection process. Female respondents made up 32.6% of the total, while males constituted 67.4%. From the random sampling conducted, the study concluded that the majority of customers in the public postal and courier services industry are male. The age group of 36 to 45 years had the highest representation at 29.4%, indicating that young adults and middle-aged individuals made up the majority of the sample, with the elderly and young being the least represented. These frequency results suggest that the industry primarily attracts a middle-aged demographic. A significant portion of respondents (38.51%) indicated that their highest level of education was high school, while there was a reasonable representation of diploma, degree, and certificate holders. Respondents with postgraduate degrees were the least common, accounting for only 3.98%. These findings indicate that most customers in the public postal and courier services industry are well-educated, with over 61% having qualifications beyond high school. Additionally, a larger proportion of responses (57%) came from urban residents, compared to 43% from rural areas, highlighting a growth potential, as the rural population also engages actively with this industry.

4.1 E-commerce adoption rate in the public postal and courier services industry

The study uncovered that the majority, about 97%, have never used the public postal and courier services industry's e-commerce services in the past year. Only about 3% had previously used these e-commerce platforms. Figure 2 presents the findings.

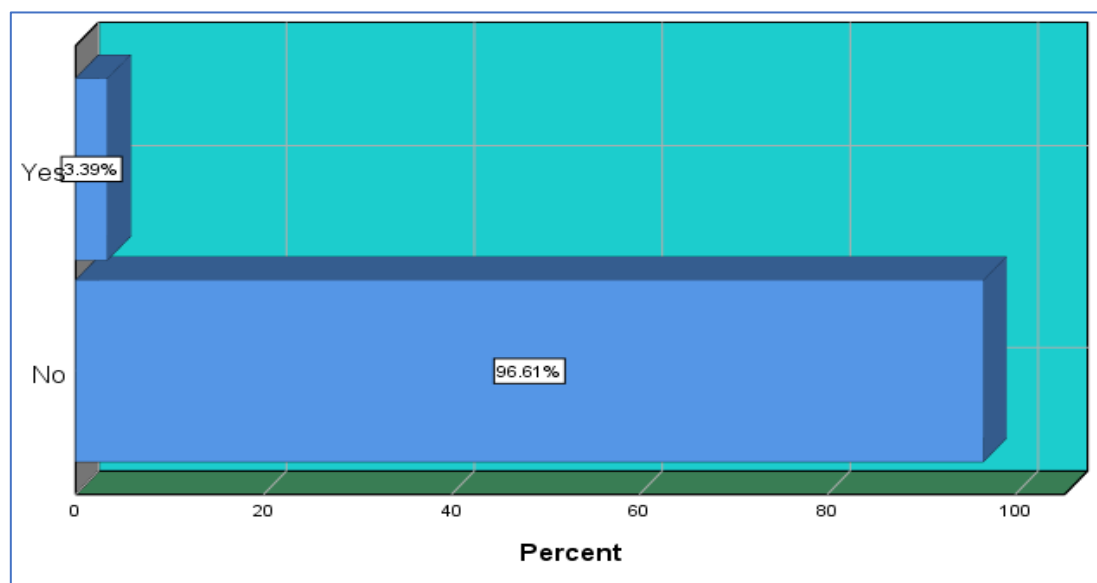


Figure 2. The public postal and courier services industry's e-commerce usage rate

According to Figure 2, the e-commerce usage rate is 3.39%, which means that only 3.39% of the entire sample size used the public postal and courier services industry e-commerce services at least once in the past year. Given that a frequency of 650 respondents use e-commerce platforms in general, yet only a frequency of 35 are using e-commerce services, this shows that there is great potential to offer e-commerce services to the ready market, which is already connected. With a population of more than 1.2 billion people, Africa is the second most populous continent on the planet behind Asia. However, according to a 2018 UNCTAD report, the region's online shoppers (at 21 million in 2017) accounted for only 2 per cent of the global e-commerce customers, meaning there is low adoption of e-commerce across Africa.

4.2 E-commerce adoption intention in the public postal and courier services industry

The study gathered data on those respondents who had never adopted e-commerce platforms of public utilities in the public postal and courier services industry, so as to measure their behavioural intention to adopt e-commerce; results are in Table 1.

Table 1. E-commerce adoption intention

Descriptive Statistics					
Scale Items	N	Min	Max	Std. Dev.	Mean
I intend to use online services	1031	1	5	1.124	4.05
I intend to encourage others to use online services.	1031	1	5	1.121	4.01
I intend to do business online	1031	1	5	1.146	3.98
I intend to upgrade my skills in online business	1031	1	5	1.030	4.17
E-COMMERCE ADOPTION INTENTION COMPOSITE MEAN SCORE					4.05

Table 1 shows that the composite mean score for e-commerce adoption intention behaviour is 4.05. Given that data was collected using a five-point Likert scale, this indicates that respondents *agreed* that they have an e-commerce adoption intention behaviour. This means that they are keen to use e-commerce. This shows a high propensity of customers to use e-commerce services if the existing barriers and challenges are addressed.

4.3 Barriers to e-commerce adoption

The study examined the barriers which the public postal and courier services industry customers were facing in accessing e-commerce services. Results were quantified in Figure 3.

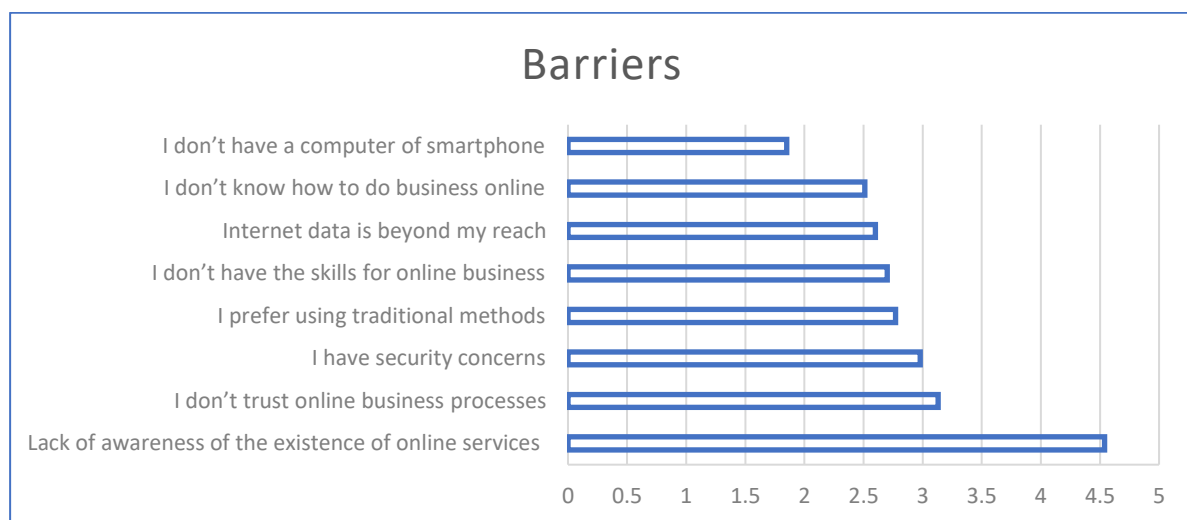


Figure 3. Barriers to E-Commerce Adoption

The study quantified the barriers to e-commerce adoption. According to Figure 3, the major barrier to e-commerce adoption and usage was a lack of awareness of the services (mean 4.54; n = 1031). Most respondents who never used online services indicated that they did not know that there were online services offered in the public postal and courier services industry. They have never been exposed to commercials and corporate communications, creating awareness of such services. A significant number of respondents also indicated that they do not trust online businesses because of their intangibility aspects (mean 3.13; n = 1031). They find it hard to pay for products/ services online without human interaction. Trusting online business was rooted in conventional business culture, which favours over-the-counter in-person selling. The third barrier of e-commerce is security fears (mean 2.98; n = 1031). The majority of respondents were afraid of e-commerce interactions. Some of these have never been scammed online; it is just an e-commerce phobia. Preference for traditional methods over e-commerce is another notable barrier, which recorded a mean score above 2.5 (mean 2.77; n = 1031). Thus, it shows that in Zimbabwe, the majority of customers still have a preference towards offline business interactions, and that draws back interest in e-commerce.

Lack of skill in e-business proved to be another significant barrier to e-commerce, with a mean score of 2.7 (n = 1031). Affordability of internet data is another barrier to e-commerce (mean = 2.6; n = 1031). Given that the mean score surpassed the 2.5 mark, this shows that a significant number of respondents found internet data a bit expensive for them. However, the mean score was just above 2.5, which also shows that many more people can now afford internet data. Thus, the impact of internet data affordability on e-commerce adoption is moderately fair or neutral.

Ignorance of e-commerce itself was also found to be a barrier (mean 2.51; n = 1031). However, the mean score was 2.51, which validates that the effect of e-commerce ignorance is rather moderate, as the majority were neutral. Although the study had posited that the absence of a digital gadget could be a barrier, the findings from this study disconfirmed that, as a mean score of 1.85 (n = 1031) shows that respondents disagreed that they did not have digital gadgets. This further shows that the majority of Zimbabweans now own smartphones, which are e-commerce-enabled. That presents a ready market for e-commerce business opportunities.

4.4. E-commerce business opportunities

Figure 4 presents the opportunities which emanate from e-commerce adoption.

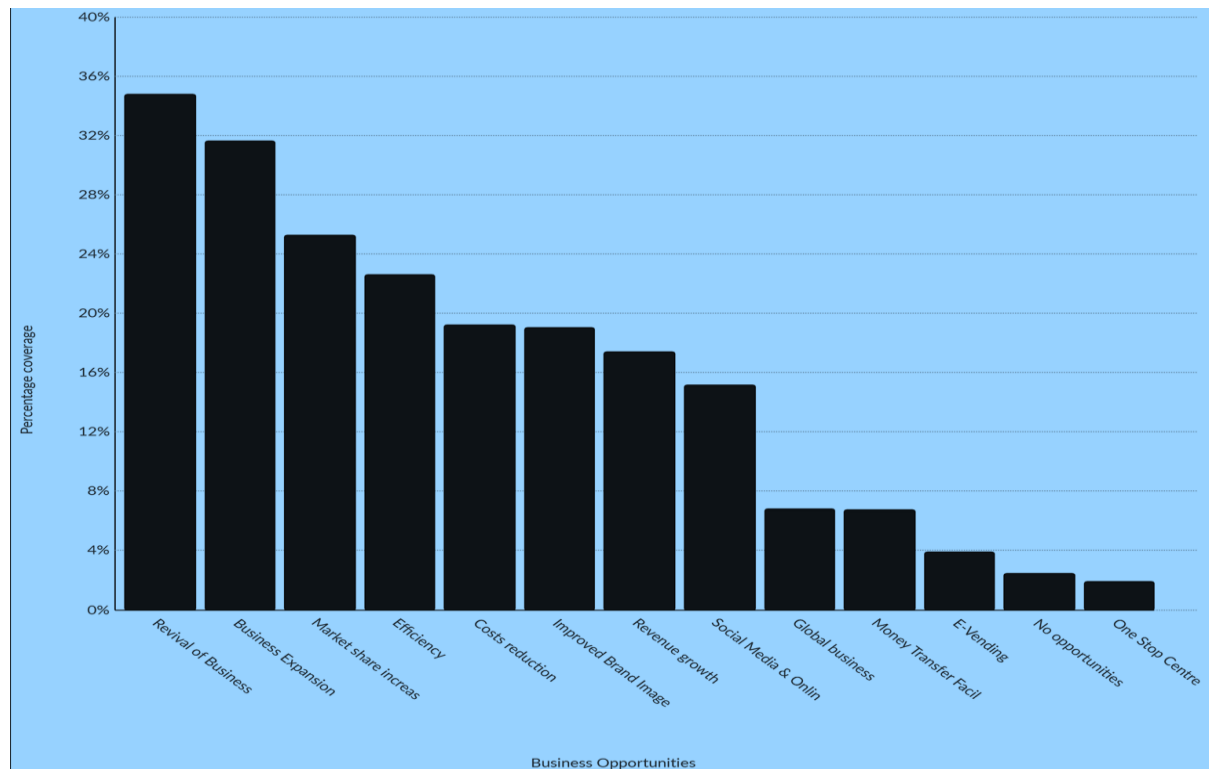


Figure 4. E-commerce business opportunities

In line with Figure 4, the major opportunity was the revival of the business (34.81%). The respondents indicated that the public postal and courier services industry has lost much of its business to competitors, and it must revive it first to gain customer confidence and loyalty, which can be done through e-commerce. Business expansion is another opportunity in which the public postal and courier services industry could diversify its business and offer new digital services (31.67%). Some notable e-commerce opportunities are a potential to increase market share (25.28%), followed by efficiency (22.61%), cost reduction (19.22%), improved brand image (19.09%), revenue growth (17.41%), social media and online marketing engagement (15.18%), increase in global business (6.86%), introduction of money transfer facilities (6.80%), enhancing e-vending (3.92%), and the creation of a one stop centre (1.92%).

4.5 Structural Equation Modelling

The study examined the structural model using model fit statistics. Table 2. presents the model fit statistics, highlighting the expected threshold and the obtained threshold.

Table 2. Structural Model Fit

	χ^2/df	GFI	SRMR	RMSEA	IFI	TLI	CFI
Obtained	3.02	0.90	0.07	0.072	0.931	0.931	0.940
Threshold	<5	>0.9/95	<0.08	<0.08	>0.9/95	>0.9/95	>0.9/95

Source: IBM-SPSS-AMOS

Additionally, the importance and significance of the structural relationships were determined through the path coefficients, with the structural equation model illustrated in Figure 5.

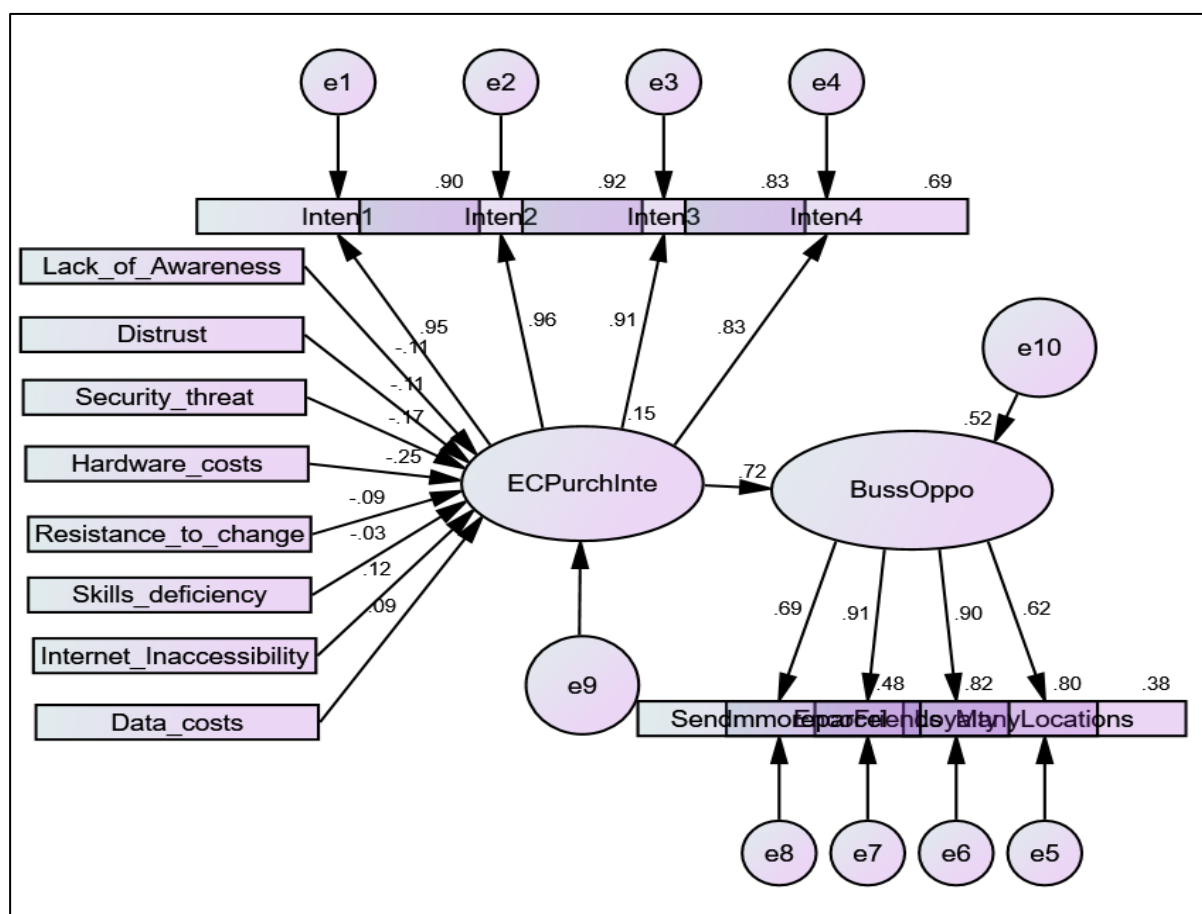


Figure. The Structural Equation Model³

³ The SEM diagram shows standardised estimates.

The structural model, in Figure 5, was assessed based on its predictive capability, indicated by R-squared. This metric represents the extent of variance accounted for by the model (Hair et al., 2016). The explanatory power of the model that was proposed in this study was 15% and 52% for adoption intention and business opportunities, respectively, as illustrated in Figure 5.

Further, Table 3 summarises the research outcomes.

Table 3. Hypotheses Testing

			Estimate	S.E.	C.R.	P	Label
ECPurchaseInte	<---	Lack of Awareness	-.110	.031	-3.745	***	Supported
ECPurchaseInte	<---	Data costs	-.092	.022	-3.128	.002	Supported
ECPurchaseInte	<---	Internet Inaccessibility	-.119	.022	-4.072	***	Supported
ECPurchaseInte	<---	Skills deficiency	-.032	.022	-1.076	.282	Not Supported
ECPurchaseInte	<---	Security threat	-.174	.021	-5.938	***	Supported
ECPurchaseInte	<---	Distrust	-.108	.021	-3.678	***	Supported
ECPurchaseInte	<---	Hardware costs	-.254	.025	-8.661	***	Supported
ECPurchaseInte	<---	Resistance to change	-.091	.020	-3.089	.002	Supported
BussOppo	<---	ECPurchaseInte	.723	.031	18.723	***	Supported

Notes¹: Estimates shown in Table 3 are standardised.

Notes²: ECPurchaseInte – E-commerce purchase intention, BussOppo – Business opportunities

5. ANALYSIS OF RESULTS

The first hypothesis (H1) examined the relationship between lack of e-commerce awareness and e-commerce adoption intention. Structural equation modelling results ($\beta = -0.110$, $T = -3.745$; $P = 0.00$) reveal a significant inverse relationship, indicating that higher awareness barriers reduce the intention to adopt e-commerce. This finding highlights awareness as a foundational enabler in the e-commerce adoption ecosystem within public postal and courier services. When users lack knowledge of online service functionality, benefits, and processes, adoption stagnates, thereby constraining the sector's ability to unlock digital business opportunities. This result aligns with prior studies (Al-Emran & Griffy-Brown, 2023; Motsi et al., 2023) and reinforces the argument that awareness is not merely a communication issue but a structural precondition for market participation and value creation in e-commerce systems.

The second hypothesis (H2) confirms a significant negative relationship between e-commerce distrust and purchase intention ($\beta = -0.108$, $P = 0.00$). This finding underscores trust as a central mediating mechanism linking adoption barriers and realised business opportunities. In public postal and courier services, which historically operate under physical and bureaucratic service models, distrust in online platforms directly suppresses transactional engagement. The implication for e-commerce theory is that trust deficits not only delay adoption but also weaken the conversion of adoption into sustained economic activity. This supports earlier findings that trust is a prerequisite for meaningful online interaction and system utilisation (Dangaiso et al., 2023; Hasan & Mardhani, 2021).

Results for H3 further reinforce the barrier-adoption nexus by demonstrating a strong negative relationship between perceived security threats and behavioural intention to adopt e-commerce ($\beta = -0.174$, $T = -5.938$; $P = 0.00$). Security concerns emerge as a dominant deterrent that magnifies distrust and limits digital participation. From an interplay perspective, security threats amplify other barriers, such as distrust and resistance to change, thereby reducing the likelihood that e-commerce adoption will translate into tangible business opportunities. Consistent with prior empirical evidence (Al-Emran & Griffy-Brown, 2023; Makudza et al., 2022), the findings affirm security as a critical lever through which public service-oriented industries can accelerate or inhibit digital transformation.

The fourth hypothesis (H4) confirms a significant negative relationship between hardware costs and e-commerce adoption intention ($\beta = -0.254$, $T = -8.661$; $P < 0.01$). This result highlights the economic dimension of adoption barriers in emerging markets, where access to smartphones, tablets, and computers remains uneven. High hardware costs restrict user readiness and suppress market expansion, limiting the scale at which e-commerce platforms can generate network effects and operational efficiencies. In the broader e-commerce discourse, this finding demonstrates how infrastructural affordability conditions the extent to which adoption can unlock new business opportunities (Makudza & Chinyerere, 2024).

Hypothesis five (H5) confirms that resistance to change negatively affects e-commerce adoption intention ($\beta = -0.091$, $T = -3.089$; $P = 0.002$). This finding foregrounds psychological and behavioural dimensions in the adoption–opportunity relationship. Even when technological and infrastructural conditions exist, resistance to digital processes constrains usage intensity and innovation potential. The result supports prior studies (Hasan & Mardhani, 2021; Religia et al., 2021) and contributes to e-commerce theory by demonstrating that organisational and consumer mindsets mediate the transformation of digital platforms into viable business ecosystems.

Contrary to expectations, hypothesis six (H6) was not supported. Skill deficiency showed no significant effect on e-commerce adoption intention ($\beta = 0.0032$, $P = 0.282$). This suggests that in the studied context, basic digital literacy may no longer be a binding constraint, potentially due to relatively high educational attainment among users. The implication for the barrier–adoption–opportunity framework is that not all traditionally cited barriers remain equally salient over time. As foundational skills improve, structural and economic barriers become more decisive in shaping adoption outcomes (Coiro, 2011).

Findings for H7 demonstrate that internet inaccessibility significantly reduces e-commerce adoption intention ($\beta = -0.119$, $T = -4.072$; $P = 0.00$). Limited connectivity constrains platform accessibility and usage frequency, thereby weakening the pathway from adoption to opportunity realisation. This reinforces the argument that digital infrastructure is a necessary condition for inclusive e-commerce growth, particularly in geographically dispersed service networks such as postal and courier systems (Masengu et al., 2022).

Similarly, H8 confirms that high data costs negatively influence e-commerce adoption intention ($\beta = -0.092$, $T = -3.128$; $P = 0.02$). Data affordability emerges as a critical economic barrier that restricts continuous platform engagement. From an interplay perspective, high data costs reduce trialability and sustained usage, thereby limiting revenue generation, market expansion, and service innovation. This finding aligns with earlier studies highlighting cost sensitivity as a major inhibitor of digital adoption in developing economies (Tiwari & Tiwari, 2020; Costa & Castro, 2021).

Finally, results for H9 reveal a strong positive relationship between e-commerce adoption and business opportunities ($\beta = 0.723$, $T = 18.723$; $P = 0.00$). This finding anchors the study's primary contribution by empirically demonstrating that overcoming adoption barriers enables public postal and courier services to unlock significant opportunities, including expanded customer reach, improved operational efficiency, and enhanced revenue potential. Consistent with prior literature (Fukker et al., 2022; Gao et al., 2023), the result confirms that e-commerce adoption serves as a strategic catalyst that converts digital readiness into sustainable competitive and developmental gains.

6. RECOMMENDATIONS

Drawing on the empirical findings of this study, the following recommendations are proposed for public postal and courier service organisations and similar service-oriented firms operating in developing-country contexts. These recommendations are framed to advance scholarly understanding of how e-commerce barriers interact with adoption processes to shape business opportunities.

6.1 *Strengthening E-commerce Awareness as a Foundational Enabler*

The findings indicate that lack of awareness constitutes a primary barrier that indirectly reinforces other adoption constraints such as distrust and perceived security risks. It is therefore recommended that public postal and courier service providers in developing economies adopt structured and sustained

awareness-building strategies that clearly communicate the functionality, benefits, and reliability of e-commerce platforms. Awareness initiatives, delivered through digital channels, community engagement programmes, and stakeholder partnerships, can reduce informational asymmetries, enhance perceived usefulness, and create favourable conditions for adoption. From an interplay perspective, improved awareness acts as a catalyst that weakens multiple barriers simultaneously, thereby enabling the conversion of adoption intention into actual usage and market expansion.

6.2 Embedding Trust and Security within E-commerce Systems

Given the strong negative influence of security concerns and distrust on adoption intention, organisations operating e-commerce platforms in developing countries should prioritise institutional trust-building mechanisms. The study suggests that robust cybersecurity frameworks, such as secure authentication protocols, transparent data protection practices, and visible compliance with recognised security standards, are essential for encouraging adoption. Academically, this underscores the role of trust and security as mediating variables through which technological systems evolve into opportunity-generating platforms. Strengthening security not only mitigates perceived risk but also reduces resistance to change, reinforcing the interdependence between psychological, technological, and economic dimensions of adoption.

6.3 Addressing Economic Barriers through Inclusive Technology Access

The results highlight hardware affordability as a significant economic barrier to e-commerce adoption. It is therefore recommended that public service-oriented logistics organisations in developing contexts explore ecosystem-based approaches that lower entry costs for users. Strategic collaborations with technology vendors, financial institutions, or development partners may facilitate access to affordable devices or flexible payment arrangements. In parallel, complementary digital literacy initiatives can enhance users' confidence in engaging with e-commerce systems. This combined approach illustrates how reducing economic constraints strengthens adoption pathways, thereby increasing the scale at which digital platforms generate operational efficiencies and new business opportunities.

6.4 Enhancing Connectivity and Data Affordability

Internet inaccessibility and high data costs emerged as critical infrastructural barriers limiting adoption. The study therefore recommends that organisations operating within digitally constrained environments advocate for and participate in multi-stakeholder initiatives aimed at improving connectivity and reducing data costs. Partnerships with internet service providers and telecommunications firms, such as subsidised data packages, zero-rated applications, or shared access points, can expand platform reach and usage frequency. From a theoretical standpoint, improved connectivity strengthens the adoption–opportunity linkage by enabling continuous engagement, transactional consistency, and service innovation.

6.5 Leveraging Adoption to Unlock Business Opportunities

Finally, the strong positive relationship between e-commerce adoption and business opportunities suggests that adoption functions as a strategic conduit through which value is created and captured. Public postal and courier service organisations in developing countries should therefore articulate e-commerce not merely as a technological upgrade but as an opportunity-enabling mechanism that supports customer base expansion, service diversification, and revenue growth. The dissemination of contextualised success narratives and sector-level case evidence can reinforce positive adoption norms and encourage broader participation. Academically, this finding reinforces the central thesis that the benefits of e-commerce materialise when adoption barriers are systematically addressed and aligned with opportunity-oriented strategies.

7. CONCLUSIONS

This study concludes that e-commerce adoption in public postal and courier service organisations operating in developing economies is shaped by a dynamic interplay between structural, perceptual, and behavioural barriers, adoption intention, and the realisation of business opportunities. Although actual usage of e-commerce platforms remains extremely low, the presence of relatively high adoption

intention indicates that demand-side willingness exists but is constrained by inhibiting contextual conditions. This intention–adoption gap demonstrates that e-commerce potential in developing-country contexts cannot be realised through platform availability alone, but depends on the systematic mitigation of barriers embedded within infrastructural, institutional, and perceptual environments.

The findings further show that barriers such as high hardware costs, limited internet accessibility, security threats, lack of awareness, distrust, and resistance to change collectively suppress e-commerce adoption, thereby delaying the conversion of user intention into actual usage. Notably, the absence of a significant relationship between skills deficiency and adoption intention suggests that contemporary adoption constraints are increasingly structural and trust-related rather than capability-based. This points to an important contextual shift within developing economies, where improvements in basic digital literacy are not necessarily matched by commensurate advances in affordability, connectivity, and institutional trust required for effective participation in e-commerce ecosystems.

Crucially, the study establishes that e-commerce adoption functions as a key transmission mechanism through which business opportunities are unlocked. Higher levels of adoption were found to strongly enhance organisations' capacity to diversify services, introduce new digital offerings, improve operational efficiency, and expand access to both existing and new customer segments. This evidence confirms that business opportunities do not arise independently of adoption barriers, but are mediated by the extent to which organisations and their operating environments successfully neutralise these constraints.

By conceptualising barriers, adoption, and business opportunities as interdependent rather than linear or sequential phenomena, this study contributes a nuanced explanatory framework to the e-commerce literature, particularly within the context of public service-oriented and logistics-based organisations in developing economies. The findings advance theoretical understanding by demonstrating that adoption is not merely an outcome of reduced barriers, but a pivotal mechanism through which digital value is created and captured.

8. FUTURE WORK

Future research is encouraged to test and extend this integrative model across different sectors and national contexts to further assess its robustness, explanatory power, and generalisability.

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