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An Empirical Investigation on the Variables Affecting Electronic Commerce Adoption in Nigeria

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ABSTRACT

This empirical study examines the important factors impacting enterprises' e-commerce deployment in Nigeria using the Unified Theory of Acceptance and Utilization of Technology and the Technology–Organization–Environment framework. While these models have been widely utilized in a variety of contexts, they may not include all of the characteristics necessary for the e-commerce market. To close this gap and improve their explanations of users' decisions to embrace and use e-commerce, the study introduced new characteristics that can help organizations make successful digital transformations while also increasing the model's ability to characterize consumer e-commerce acceptance behaviour. A quantitative survey of 336 respondents was carried out utilizing the convenience sample technique to obtain measurable data for the investigation of relationships between multiple influencing variables. Data was analysed using descriptive and inferential statistics methods. The findings revealed that, while effective e-commerce implementation could significantly improve the socioeconomic well-being of businesses and consumers, insufficient Information and Communication Technology (ICT) infrastructure, poor internet connectivity, concerns about transaction security, high internet service costs, and e-commerce technology implementation all pose significant barriers to mainstream e-commerce adoption and utilization in Nigeria. To improve living standards and promote inclusive economic growth, the study recommended that the government and network providers address the barriers to e-commerce adoption, such as insecurity, high data subscription fees, electricity, and poor network services.

Keywords: Descriptive Statistics; E-Commerce Adoption; Digital Transformation; Technology Acceptance; Online Commerce; Nigeria

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1. Introduction

Electronic or e-commerce refers to the use of digital information processing and electronic communications in economic transactions to build, redefine, and transform relationships to generate value between or among firms, as well as between organizations and individuals. It entails carrying out commercial transactions through digital channels across telecommunications networks, maintaining business ties, and sharing business data. The Organization for Economic Cooperation and Development (OECD) defines e-commerce as any commercial activity that takes place in an open network integration, including business-to-business (B2B) and business-to-consumer (B2C) transactions. E-commerce entails conducting business with a completely different perspective and a medium that circumvents the most fundamental rules of regular business procedures^[1].

The internet and related technologies are essential for every modern economy's long-term viability and expansion. The advancement of information technology has improved consumers' and businesses' abilities to obtain information while purchasing goods and services. Information and Communication Technology (ICT) provides businesses with increased competition, lower prices for goods and services, the ability to compare items from numerous vendors, and easier access to various vendors anywhere and at any time. As a result, information technology promotes worldwide trade^[2]. Nations are gradually adopting ICT-driven solutions to boost their competitiveness. The adoption of new business models and the integration of ICT has resulted in an economy distinct from traditional ones, prompting businesses to reevaluate their existing strategies. This transition has resulted in whole new business models and pushed many established organizations to build an online presence only through digital commerce platforms^[3].

E-commerce, which is seen as a critical component of the modern information economy, is dramatically changing the structure of the business environment and how individuals and groups conduct business with one another. Advances in communication and transportation technology have resulted in the emergence of new forms of cultural production, consumption, and trade, eradicating physical and conceptual barriers and creating a world without borders^[4]. E-commerce has emerged as an essential driver of global eco-

nomics in the twenty-first century. It broadens the market for businesses by providing new sales opportunities, while also allowing consumers to access a diverse range of products and services through digital platforms. In a fast-changing climate typified by increased commercial interchange digitization, the adoption of digital technology and online commerce solutions has become an essential tool for emerging countries^[5]. This transition, fueled by the Fourth Industrial Revolution (4IR), has put digitization at the heart of global competition, presenting new opportunities and challenges for firms in both developed and developing countries. E-commerce has become a key element in this shift, enabling companies to reach a wider customer base, advertise products, boost profits, receive information promptly, send money faster, maintain information consistency, enhance customer service, cultivate stronger customer relationships, customize products, obtain a competitive edge, lower operating costs, and increase efficiency^[6].

The emergence of e-commerce platforms has fundamentally changed how consumers engage with the market. In today's digital world, people can easily buy the products they want from their personal devices, regardless of time or location. This has greatly improved user experiences, saved money and time and prevented store congestion^[7]. Adoption of e-commerce offers numerous advantages across a range of intra-firm and inter-firm business processes and transactions in developed and developing countries. The advantages of e-commerce adoption range from cost savings, simple and inexpensive promotion and marketing, simpler connection with trading partners, quick reaction to client requests, and reduction of inefficiencies. The electronic movement of information via networked computers and shared files can boost an organization's efficiency and productivity. E-commerce usage in enterprises can significantly cut operating costs by lowering transaction, material, procurement, and logistical costs^[8].

It is reasonable to expect that these benefits of e-commerce will continue to promote its global adoption. E-commerce is now a need rather than an option, and the only choice is how swiftly or slowly to begin. As a result, organizations must reassess their e-commerce models and business strategies in order to capitalize on the marketplace's shifting dynamics^[9]. Research has shown that organizational awareness, technology preparedness, and environmental forces

are important predictors of e-commerce adoption, and that e-commerce has been successful in industrialized nations. These conclusions, however, cannot be applied directly to developing nations because their socioeconomic environments are very different. For example, low internet penetration and mistrust of digital payment systems frequently impede customer interaction with e-commerce platforms^[10]. Developing countries present distinct obstacles to e-commerce adoption and acceptance compared to developed countries, and they continue to lag behind in adopting new IT solutions to support e-commerce^[11].

Almost all of the world's emerging nations rely heavily on commerce for their economic activity. For the majority of developing nations, e-commerce adoption offers both growth opportunities and particular challenges. Although research has demonstrated the advantages of e-commerce, including better efficiency and easier access to global markets, businesses and consumers in these areas confront substantial obstacles. These include a lack of regulatory frameworks to support a secure e-commerce environment, insufficient digital infrastructure, restricted access to dependable internet services, and doubts about online payment methods^[12]. Nigeria is a genuinely distinct operating environment with its own set of difficulties, such as limited payment gateways, inadequate infrastructure, logistical limitations, security, capital access, or a lack of client confidence. Despite these obstacles, it is impossible to overstate the growing significance of e-commerce in Nigeria's economic development, given that it is one of the country's most active and significant non-oil GDP contributors. Given the volume of business activity occurring in Nigeria and the speed at which information technology is developing, it is critical to investigate potential obstacles to e-commerce adoption by Nigerian businesses, which have not yet seen substantial growth in this area.

E-commerce adoption has the potential to greatly boost Nigeria's economy, particularly by encouraging entrepreneurship, creating more jobs, and boosting business competitiveness. Therefore, it is crucial for firms, consumers, and policymakers to comprehend the elements that support or impede the development of e-commerce in this setting. This article explores the factors influencing consumers' adoption of e-commerce in Nigeria. As part of an empirical study, an online questionnaire was distributed and completed by 336 Nigerian respondents from various regions of the country.

The purpose is to uncover both facilitators and hurdles to e-commerce adoption, as well as to provide insights into methods for building a stronger digital economy. This study adds to the expanding body of literature on e-commerce in developing countries while also making recommendations to strengthen Nigeria's e-commerce ecosystem.

Development research has identified several important elements for economic development, but there is a lack of empirical studies connecting these factors to e-commerce. The current study aims to provide empirical answers to the following research question in order to better understand the potential and increasing significance of e-commerce to Nigeria's socioeconomic development: What are the factors influencing the adoption of e-commerce technology in Nigeria, and how do they interact with one another? This study provides quantitative details on the perspectives, difficulties, and advantages of implementing e-commerce technologies in Nigeria. The objective is to gain an in-depth knowledge of how technological, organizational, and environmental factors influence e-commerce decision-making intentions and their impact on Nigeria's digital transformation process. The relevant hypothesis created to meet the study's specific objectives is provided in null form below:

H0. *E-commerce adoption has no significant effect on Nigeria's current socio-economic conditions.*

The TOE framework regularly identifies top management support and technology readiness as critical organizational factors influencing businesses' adoption of e-commerce. Even though these traits have been studied extensively, it's probable that they fail to accurately reflect the complexity of the adoption process. In order to resolve the empirical gap in Nigerian enterprises' and consumers' intentions to adopt e-commerce, this study integrates the Unified Theory of Acceptance and Use of Technology (UTAUT) with the Technology–Organization–Environment (TOE) framework. It also includes an uncommon perspective on customer behaviour and online experience. A quantitative survey of 336 conveniently sampled respondents was employed to obtain an extensive viewpoint on the intention to use e-commerce. The study contributes to both academia and practice by presenting an integrated approach for a better comprehension of e-commerce adoption intentions among Nigerian businesses and consumers.

Theoretically, it expands the TOE framework by incorporating innovation culture as a key factor influencing how companies interact with e-commerce. Technological expertise is another crucial element that is sometimes overlooked but is just as significant. In the digital age, proficient use and management of technology is not only advantageous, but now essential. Technology-savvy companies are better able to incorporate e-commerce solutions, improving customer relations and operational effectiveness. Having a greater knowledge of how technological savvy drives e-commerce adoption is critical for understanding firms' overall digital transformation. Practically, the research provides a scientific foundation to assist firms in designing effective digital transformation strategies, improving technology capabilities, and training human resources in line with digital trends. It also provides policymakers with insights into how to strengthen legislative frameworks, digital infrastructure, and e-commerce trust-building procedures that are customized to the specific circumstances of Nigeria's emerging digital economy. A scientific assessment of this kind would offer important direction for corporate and policy decisions.

The findings of the study will assist entrepreneurs in making well-informed choices regarding the integration and application of ICT in their company operations, guaranteeing the competitiveness and resilience of their endeavours. It is anticipated that this study will bridge the information gap and offer helpful suggestions for promoting the growth of e-commerce in Nigeria and other developing nations. The remainder of the paper is organized as follows: Section 2 focuses on the theoretical and conceptual literature; Section 3 describes the methodological techniques; Section 4 displays the outcomes of the analyses and discussions; and the final section provides policy recommendations based on the findings.

2. Conceptual and Theoretical Review

2.1. Conceptual Framework

E-commerce is the process of purchasing and selling goods and services online. It entails conducting business transactions on an internet platform, which might include things like online shopping, electronic payments, and online auctions. With the broad acceptance of digital tech-

nology and the advent of the internet, e-commerce platforms have transformed the way businesses function, creating new prospects for growth and expansion^[13]. Furthermore, the COVID-19 pandemic has increased the adoption of e-commerce in several industries, as businesses have been forced to adjust to remote working and social distancing policies. This has resulted in an increased reliance on internet channels for buying and selling things. The use of digital technologies has proven to be the best strategy for improving operational performance. Overall, investing in e-commerce can provide firms with benefits such as increased efficiency, a wider client reach and the flexibility to respond to changing market conditions^[14]. It provides a number of advantages to both customers and businesses, such as reduced transaction costs, greater convenience and flexibility, and access to a larger market. But there are drawbacks to e-commerce as well, like privacy and security issues and the necessity to compete in a congested online marketplace^[15].

Adoption, as defined by Giang et al. (2024)^[16], is the real-world deployment of a certain Information and Communication Technology (ICT) system—such as a laptop, desktop computer, or mobile phone—for e-commerce and e-shopping. According to Ali et al. (2021)^[17], ICT adoption refers to how people use ICT to solve problems in their daily lives. Based on the definitions provided previously, this study defines e-commerce adoption as an individual's deliberate desire and proclivity to utilize an ICT system to complete a task—in this case, completing an online purchase from a merchant—via the merchant's website, social media fan page, or both. Businesses frequently use internationalization tactics to increase sales, become more competitive, and generate large profits. Among these strategies is the use of social media and website-based retailing to manage online firms^[18].

Businesses all across the world have embraced e-commerce because it allows them to perform transactions that have transformed their sectors and improved their economies. As online shopping becomes more popular and consumer attitudes change, both domestic and foreign (multinational firms) retailers are attempting to improve the efficacy of their present online marketing methods and develop new ones in order to grow their businesses and maximize profits. Long-term, continuous growth and strong client loyalty now require a successful internet presence. Even if e-commerce is used differently around the world, there are various elements

that make it easier or more difficult to utilize depending on where you are. This ranking of essential variables takes into account the social, political, economic, and technological conditions common to each region. Thus, organizations that refuse to adopt these new technologies risk losing clients to competitors^[19].

2.2. Theoretical Framework

Numerous frameworks have been created to examine different facets of the infrastructure, traits, and components that affect the expansion and spread of the Internet and e-commerce in developing countries. The primary findings indicate that there are notable differences in the growth of the Internet and e-commerce in advanced and developing nations. The current study investigated the variables influencing the adoption of e-commerce within the context of the Unified Theory of Acceptance and Use of Technology (UTAUT) integrated with the Technology–Organization–Environment (TOE) framework.

2.2.1. Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) model, developed by Venkatesh et al.^[20, 21], serves as the theoretical foundation for this research. It has been widely used in theoretical and empirical literature to investigate the factors impacting e-commerce adoption and utilization in both established and emerging countries. The theory attempts to explain consumers' intentions to embrace an information system and their subsequent usage behaviour. According to the theory, six primary characteristics directly influence users' decisions on when and how to utilize new technologies: performance expectancy, effort expectancy, social influence, facilitating conditions, technology awareness, and mobile skillfulness. Gender, age, experience, and volitional use are thought to alter the impact of the six major factors on usage intention and behaviour^[17].

Performance Expectancy

According to Venkatesh et al. (2007)^[22], performance expectation refers to how much a person believes embracing technology would assist him or her in increasing job performance. According to the idea, performance expectancy is connected with factors such as perceived usefulness, relative

advantage, work fit, extrinsic motivation, and outcome expectancy. Previous research has revealed empirical evidence that age and gender play a significant moderating influence in the link between performance expectancy and behavioural intention. According to Gao et al. (2023)^[14], performance expectations have a direct influence on e-commerce adoption. Rabi et al. (2021)^[23] discovered that performance expectancy has a substantial impact on people's readiness to embrace e-commerce, which has the potential to improve many elements of corporate operations. Similarly, Bananda and Nwagwu (2021)^[24] revealed that performance expectancy was the best predictor of behavioural intention to utilize e-commerce. This shows that performance expectations may play a significant role in influencing whether businesses in Nigeria accept or reject e-commerce. As a result, in the context of this study, it is expected that Nigerian consumers and businesses will accept and use e-commerce if they find it beneficial.

Effort Expectancy

Before using an information system, consumers usually consider the work involved. The level of convenience that customers have when utilizing technology is known as their effort expectancy^[25]. Previous research found that effort expectancy has a greater impact on behavioural intention in older employees and young women. To minimize the link between the constructs, Venkatesh et al. (2012)^[21] proposed the effects of age, gender, and experience. Effort expectancy characterizes users' perceptions of the efforts connected with the use of technology, and consumer benefits vary depending on the type of click-and-collect model and user age^[26]. Convenient and simple technology lets users feel connected. Users may be motivated and more likely to adopt a technology if it is simple to use^[27].

Social Influence

Social influence is described as the external environment that surrounds a person and has the capacity to change their beliefs and behaviour, such as the opinions of friends, family, coworkers, and relatives^[21]. Other key factors influencing business practices, including e-commerce, include governance efficiency and the compatibility of the traditional commercial environment. Social influence and personal opinions have a significant impact on the adoption of new technologies^[28]. Previous studies on the endorsement of

e-commerce have produced consistent findings about the role of social norms on e-commerce adoption. According to Senali et al. (2022)^[29], social influence elements like affiliation and perceived popularity of new technologies all have an impact on e-commerce acceptability.

Facilitating Condition

The facilitating condition parameter refers to a person's belief that there is an organizational and technological infrastructure in place to enable the usage of a technology. To put it another way, an enabling condition occurs when someone has access to all of the resources required to use a system, including all essential tools, equipment, facilities, and assistance^[30]. To use e-commerce properly, a user must have the latest information and communication technology. Facilitating conditions include self-assessment of one's level of understanding and the availability of assistance with e-commerce technology installation^[15]. The concept of facilitating conditions in UTAUT was created by merging internal and external support components. As a result, in order for customers to overcome certain obstacles, such as the lack of in-person shopping experiences, the lack of direct personal contact with sales representatives, the use of counter interfaces rather than clerks, and the need for shipment tracking, e-commerce necessitates the presence of knowledge, resources, and support^[18].

Technology Awareness

Alam et al. (2023)^[31] describe technology awareness as a citizen's ability to recognize the uses and benefits of technology. Thus, awareness of anything that piques attention is the first step in consumer behaviour, followed by the following stages of the purchasing process. According to Hanifah et al.'s (2025)^[32] acceptance process analysis, the awareness stage is critical before the adoption of any technology. They also point out that government policymakers' desire to prioritize ICTs for national development has a direct impact on e-commerce adoption. Awareness is a critical prerequisite for the formation of ethical standards, which are unfortunately missing in developing countries, particularly in the case of e-commerce services. According to Oloruntuyi and Ojeka (2023)^[1], technological awareness had a significant role in Nigeria's adoption of electronic payment systems. Because e-commerce is still a relatively new concept in Nigeria, increased awareness is required, as the existing level is

insufficient. Increasing awareness is expected to lead to increasing adoption and use of e-commerce in Nigeria.

Mobile Skilfulness

In this study, skilfulness refers to an individual's assessment of their ability to make online transactions via a mobile device. However, it is known that a user's likelihood of adopting and using a mobile device for online purchasing increases as their technological competency and confidence grow. Fear arises when people attempt to perform behaviours for which they are not skilled^[33]. Numerous studies have looked into skilfulness as a crucial component influencing users' behaviour towards a specific technology^[18, 34, 35]. Ariansyah et al. (2021)^[36] presented a solid argument for the observation that skill is an important factor in the e-commerce industry. As a result, the potential influence of mobile skilfulness is one of the most important aspects influencing e-commerce acceptance in Nigeria, making understanding it critical. Other cultural factors influencing e-commerce outcomes include technology acculturation and culturally particular ideas and values. Both have a direct impact on e-commerce uptake and usage by simplifying the transfer and deployment of ICT.

2.2.2. Technology–Organisation–Environment Model (TOE)

The Technology–Organization–Environment (TOE) framework was developed by Tornatzky and Fleischer (1990)^[37], which is widely regarded as a comprehensive model for analyzing technological adoption. It looks at three important factors that affect how an organization adopts technology: Environmental, organizational, and technological contexts. The various constructs affecting users' decisions to adopt a new technology according to the theory are highlighted below.

Perceived Cost Acceptability

The costs of adopting e-commerce are critical technological considerations that influence corporate decision-making. According to Cheshmehzangi (2025)^[3], firms frequently confront significant financial limitations. Due to limited financial resources, firms must exercise caution when making investments, which means that only those with sufficient capital will consider e-commerce adoption as a viable choice. Furthermore, indirect costs, such as human

resource expenses (e.g., training) and temporary loss of production during the transition, might be more costly than direct costs^[38]. As a result, the entire cost of implementing e-commerce is a critical factor in adoption choice.

Perceived Ease of Use

Perceived Ease of Use (PEU) is the degree to which adopting a new technology is seen to be easy. Businesses are more likely to adopt user-friendly innovations^[34]. Depending on the underlying incentives, perceived ease of use might have an impact both directly and indirectly on the decision to accept innovation. Motivations for e-commerce adoption frequently include both intrinsic (such as ease of navigation and better interfaces) and extrinsic (such as enhanced performance). While perceived ease of use does not always influence adoption decisions, a large body of research has revealed a favorable relationship between perceived ease of use and e-commerce adoption decisions in a variety of scenarios^[27].

Perceived Behavioural Control

According to Bening et al. (2023)^[30], perceived behavioral control, or PBC, is a person's assessment of their capacity to carry out a specific action, which may not always be completely under their control. Introduced in behavioral models, this idea aids in explaining non-voluntary behaviors. Perceived self-efficacy and perceived controllability are the two main subcomponents of perceived behavioral control, according to Sandu et al. (2025)^[7]. Intentions and actual behavior are influenced by perceived behavioral control, according to the Theory of Planned Behavior. The importance of perceived behavioral control in embracing different technologies has been confirmed by a number of studies^[39].

Awareness of E-Commerce

Awareness of e-commerce is commonly the initial stage in the adoption process, although it is sometimes disregarded. Organizations must acknowledge both the rewards and risks of implementing innovations. According to Fonseka et al. (2022)^[27], the adoption process begins with awareness and concludes with a decision to adopt or reject the innovation. In developing nations, where understanding of efficient utilization and benefits is poor, managers' ability to build knowledge about the benefits of innovation is critical to adoption decisions^[2].

Perceived Relative Advantage

Perceived Relative Advantage is the degree to which an invention is regarded as superior to the technology or process it replaces. While Skare et al. (2023)^[11] contended that this attribute lacked theoretical robustness, Ghazaleh and Abdallah (2024)^[15] discovered that recognizing the relative advantage of e-commerce greatly enhances the chance of its adoption by businesses. Studies have established the relationship between relative advantage and e-commerce adoption, with findings suggesting that it favorably influences adoption decisions^[8].

Market Forces E-Readiness

Market Forces, a notion based on economic theory, refers to the competitive pressures that exist inside a free market. These forces can also influence an organization's attitude towards innovation adoption. Market forces e-readiness assesses the degree to which a company's consumers, partners, and rivals have adopted or are planning to implement e-commerce^[31]. Firms frequently feel obligated to adopt e-commerce in marketplaces where competitors and suppliers have already done so. Prior studies have shown a link between a company's decision to use e-commerce and external market forces^[39, 40].

Perceived Security

Advances in information and communication technology (ICT) that rely on internet-based data transfer frequently raise serious security concerns—the perceived safety of online platforms for data and financial activities. As a result, enterprises and consumers may have concerns about data privacy, information security, and unlawful access. Many developing economies have inadequate institutional structures for safeguarding e-commerce-related contracts, making online transactions insecure^[7]. According to research, increased security concerns can limit e-commerce usage.

Perceived Compatibility

Perceived Compatibility assesses how well an innovation matches existing demands, practices, and values. Compatible innovations are more likely to be accepted. Compatibility refers to the consistency of e-commerce systems, an organization's current technological infrastructure, and relationships with customers and suppliers^[26, 41]. The higher the innovation's compatibility with existing systems and

procedures, the easier it is to deploy and integrate into a company. This is consistent with Senali et al. (2022)^[29], who discovered that business managers are more willing to accept e-commerce if it is compatible with their current business operations, culture, and infrastructure, increasing optimism. Additionally, a number of studies have shown that compatibility plays a crucial role in the adoption of innovations in underdeveloped nations^[13].

Human Resources

The foundation of an organization’s success is its resources, which include its business, technological, and human assets. Businesses may overcome obstacles, take advantage of opportunities, and keep a competitive edge when they have enough resources^[42]. However, e-commerce adoption is still hampered in emerging nations by a lack of infrastructure, digital expertise, and experience^[10]. In order to accelerate digital transformation and advance sustainable development, it is crucial to evaluate and guarantee access to vital resources.

There has not been much research done on entrepreneurs in this area, despite e-commerce’s increasing popularity and potential advantages. To better comprehend the distinctive advantages and difficulties Nigerian businesses face when embracing e-commerce and to determine the best adoption tactics, further empirical research is required.

2.3. The Proposed Conceptual Framework

During the COVID-19 epidemic, technology was critical in keeping people linked, promoting education, providing medical help, conducting business, facilitating governance, encouraging innovation, and much more. As a result, conducting a thorough examination of technology uptake and acceptance is critical, especially in the post-COVID-19 era^[15]. The question “What motivates individuals to embrace novel technologies?” is frequently asked by scholars, technocrats, developers, and others. Answering this question can help to design more successful techniques for creating, assessing, and anticipating user reactions to future technology.

A conceptual framework is a diagram that symbolises the relationships between variables of interest in a study and which shows the transmission path of these variables. A research model based on an adaptation of the Unified Theory of Acceptance and Use of Technology (UTAUT) in-

tegrated with the Technology–Organization–Environment (TOE) framework with additional factors is proposed in order to examine the factors affecting users’ acceptance of e-commerce in Nigeria. The research model is designed to test the effects of performance expectancy, effort expectancy, social influence, facilitating conditions, technology awareness, mobile skilfulness, perceived cost acceptability, perceived ease of use, perceived behavioural control, perceived awareness/education, perceived benefit/relative advantage, market forces e-readiness, perceived security, human resources and perceived compatibility on behavioural intention to adopt e-commerce. The pathways through which these various constructs influence the intention to embrace e-commerce in Nigeria are demonstrated diagrammatically in **Figure 1**.

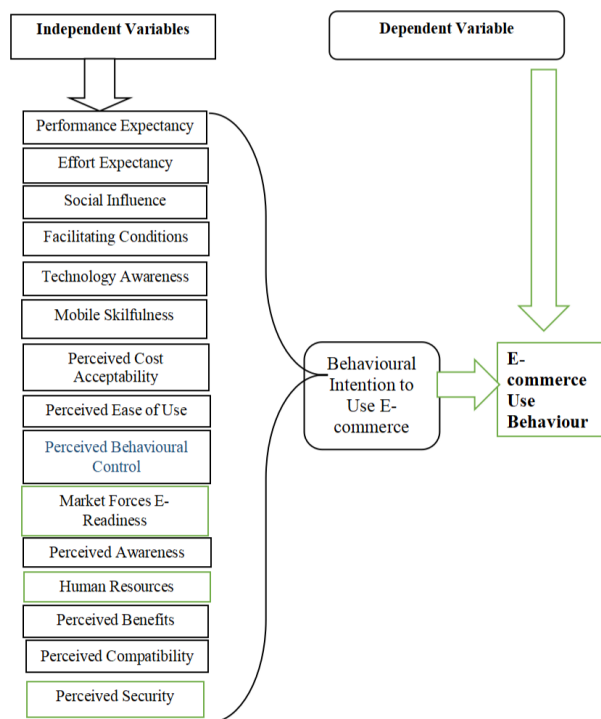


Figure 1. The Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology–Organization–Environment (TOE) integrated conceptual framework illustrate the various constructs influencing e-commerce adoption in Nigeria.

3. Materials and Methods

This section discusses the survey sample selection procedure, the construction and deployment of the survey instrument for the current study, as well as reliability and validity parameters.

3.1. Research Design

The existing literature indicates that technology and e-commerce research incorporate both quantitative and qualitative concepts. The purpose of this study is to conduct an empirical investigation of the factors driving e-commerce adoption in Nigeria. To acquire empirical solutions to the research questions, this study deployed a quantitative and descriptive method that evaluated the factors impacting e-commerce adoption in Nigeria. This approach allows for the collection of measurable data and the examination of correlations between numerous impacting variables. To achieve the research aims and increase the general acceptability of the research findings, descriptive techniques were adopted, which simplify the interactions between the parameters under study while also providing ways for accepting and rejecting hypotheses^[43]. When utilizing quantitative techniques to explore the adoption of e-commerce in Nigeria, numerous elements must be examined, as the interpretation of one scenario may not be sufficient to offer a model to aid in the adoption of e-commerce. However, qualitative approaches can be useful in obtaining an overview of the population as a whole and developing a shared knowledge of the section under investigation. Previous researchers have also used quantitative approaches in technology and e-commerce research, yielding positive and reliable results, particularly in the context of the Technology Acceptance Model (TAM), UTUAT, and TOE^[5, 6, 15].

3.2. The Study Population

A study's population, according to Oloruntuyi and Ojeka (2023)^[1], is all potential cases (people, things, events), or subjects that share a common set of characteristics that make up a known whole entity that a researcher wishes to study. The study's target population consists of individuals who are literate and who are able to perform basic online transactions, like buying, selling, or participating in other e-commerce activities, using a smartphone, laptop, tablet, smart TV, or personal computer. These demographic groups were chosen on the grounds that it is presumed they are familiar with the internet, have engaged in some form of e-commerce, and are reachable via email, smartphones, tablets, or personal computers. Nigeria ranks among the world's most populous countries. It reported approximately 152 mil-

lion active internet users, which is roughly half of the total population^[44]. This population is far too large to capture and analyse. Aside from time constraints in collecting, analysing, and interpreting such a large volume of data, there are also limited financial resources to handle it, so the sample will be suitable for analysis and generalisation.

3.3. Sampling Procedure

A sample is a portion of the population that has been carefully chosen to participate in the study; its results are projected to be representative of the entire population, assuming that the participants share certain characteristics^[6]. This study conducted a self-administered questionnaire to investigate the factors that influence e-commerce adoption in Nigeria. The survey research strategy is a commonly accepted and used method in business and management research. Its goal is to draw generalizations about a population by gathering data from samples. It is commonly used for qualitative and quantitative studies and is linked to the deductive approach. Surveys are utilized because they allow for the collection of a significant amount of data from a large population in an extremely cost-effective manner^[15].

The researcher employs a questionnaire-based survey methodology to collect data from Nigerian e-commerce specialists. The first stage in selecting survey respondents is to properly characterize the population of interest. To obtain the most correct perspectives on the factors impacting e-commerce growth in Nigeria, we need to engage specialists who can educate us about our research questions. This is because the opinions of these specialists who utilize e-commerce platforms online should be more similar to the actual objective variables than those of less experienced individuals who may also have an opinion on what influences e-commerce establishment in Nigeria.

Due to inadequate population detailing, the study used a convenience sampling method. Convenience sampling is a type of non-probability sampling in which individuals from the target population are selected based on specific practical considerations such as being readily accessible, living within reach, available at a particular moment, or willing to participate^[33]. This method was chosen due to its usefulness and feasibility in this particular research context. Individuals who coincidentally come across the researcher's path or happen to be online through social media platforms like

Facebook, WhatsApp, etc., easily meet the study's inclusive criteria and are therefore included in a convenience sample. As a result, it is easier for the researcher to find volunteers; however, bias is a greater problem than with a random sample, meaning that not every member of the population will have an equal chance of being chosen for the sample. Convenience sampling methods produce less representative and less reliable samples, require less effort, and may not produce results that can be generalized to the entire population^[5].

In this study, a subset of 360 respondents who use the internet for business transactions was conveniently selected from Nigeria's total active internet user population of approximately 152 million. Out of the 360 questionnaires distributed, 336 were returned, properly completed, and deemed suitable for the empirical analysis of this study, while the remaining 24 were either not returned, incomplete, or wrongly completed. This study's empirical analysis included 336 validly completed questionnaires, representing a response rate of 93.33%. All participants were informed of the study's purpose and provided their informed consent in accordance with ethical research standards. Respondents willingly participated in this study, and their identities were kept hidden, making responses anonymous and unreachable to those involved.

Most behavioural research requires a sample size of at least 30 but no more than 500 people. This strategy has been widely used in management and marketing research, particularly those that use structural equation modelling (SEM). This criterion is met by the 360-person sample, which strikes a balance between statistical power, generalizability, and practical feasibility, especially in the context of e-commerce adoption-oriented research in an emerging market economy. This strategy improves the reliability and veracity of study findings while also making it easier to collect accurate data.

This study was conducted in accordance with the ethical principles of research involving human participants. All respondents participated voluntarily, and informed consent was obtained before data collection. The anonymity and confidentiality of participants were assured, and no personal identifying information was collected. The data were used solely for academic research purposes.

The research protocol was reviewed to ensure compliance with ethical standards, and no physical, psychological, or social harm was caused to participants. As this study in-

volved survey-based data without medical or experimental procedures, ethical approval from an institutional review board was not required.

3.4. Nature and Sources of Data Collection

Both primary and secondary sources provided the data that were analysed in this study. Secondary data about e-commerce activities were gathered from published sources, including academic journals, government publications, textbooks, internet resources, and other library sources. A structured questionnaire that the researcher personally administered via social media was used to collect the primary data. The study employed a meticulous process to generate accurate data from relevant experts, ensuring that the study's conclusion and results validly answered the research questions regarding the growth of e-commerce in Nigeria. Because it is time- and cost-efficient, the survey questionnaire technique was used in this study to collect pertinent data from the respondents.

Questionnaires are commonly used when data and perspectives from a large number of people are required. The designed questionnaires are used to gather feedback from those who are acquainted with e-commerce business activities and have spread throughout Nigeria's commercial cities. The respondents are all educated, with varying levels of education and backgrounds. This is because educated people are more likely to use electronic media to buy or sell goods and services. The researchers believed that because these groups of people participate in e-commerce activities, they would be more competent to respond to questions about them^[6]. For this reason, the survey's target audience was users of social media and mobile devices, which made it easier to comprehend user opinions numerically. The survey was created using a Google Form and sent electronically to people, and groups on WhatsApp, Facebook, and via email. In this digital or internet-driven age, distributing questionnaires electronically is more efficient and less expensive than distributing paper ones. To help the researcher distinguish between facts and opinions, closed-ended questions were developed and used to collect data pertinent to the research questions and objectives.

The questionnaire was therefore split into four sections. The respondents' demographic profile is presented in the first

section. The questions in the second section pertain to the respondents' level of e-commerce activity, familiarity, and use. Questions about the advantages and obstacles of e-commerce establishment that promote or obstruct its successful growth in Nigeria are included in the third section, and questions about the impact of e-commerce activities on respondents' socioeconomic conditions are included in the final section. A five-point Likert scale with the options of strongly agree, agree, neither agree nor disagree (neutral), strongly disagree, and disagree was used to assess respondents' thoughts on the factors influencing the reception of e-commerce transactions in Nigeria. The five-point Likert scale has been deemed one of the most suitable and commonly used measurement scales in business research since it permits participants to express their level of agreement or disapproval^[4].

3.5. Validity and Reliability of the Data

The researcher also assessed the validity and reliability of the research instrument to ensure that the research outcome is compelling and psychometrically sound. Validity is a measure that indicates the extent to which a data collection instrument accurately measures what it is supposed to measure. In other words, validity is the degree to which changes or variance found with a measuring instrument depict the true changes or differences among those attributes being tested^[43]. It is categorized into internal and external validity of the measuring instrument. Conversely, the level of consistency with which an instrument can measure an attribute is termed reliability. The reliability of a measuring instrument has to do with the accuracy and precision of a measurement procedure. In this case, practicality is much concerned with a wide range of conditions or factors of economy, convenience, and interpretability^[15].

Higher dependability is indicated by a device producing less inconsistency between repeated measurements of an attribute. There exists a correlation between validity and reliability. It is unlikely that a faulty measuring device can be trusted. The questionnaire was first pre-tested by a panel of experts who evaluated the survey instrument's face validity and content to determine the instrument's reliability. To evaluate the constructs' discriminant and convergent validity as well as the items' reliability, the researcher further tested the updated instrument on a pilot study comprising fifty respondents. The Cronbach Alpha method was used to determine

the internal consistency of the instrument. The result yields a coefficient of 0.83%, indicating that the research instruments were reasonably reliable and met the generally recommended threshold level of 0.70 for the study's research indicators^[7]. This instrument's high reliability bolsters the credibility and consistency of the data collected and analysed in this study.

3.6. Method of Data Analysis

The analytical tools used to capture the study's objectives include descriptive and inferential statistics. Descriptive statistical tools such as tables, frequency distributions, percentages, and charts were used to explain, identify, and summarize the factors influencing e-commerce adoption in Nigeria. Inferential statistical tools such as sampling, correlation, and chi-square analysis were used to rationally interpret observed facts, make accurate and trustworthy decisions, generalizations, predictions, and conclusions about the population based on the established characteristics of the sample. The chi-square statistical tool, used to conduct the hypothesis test, allows for a thorough evaluation of the statistical significance of e-commerce adoption in Nigeria.

The chi-square test measures the difference between the observed and expected frequencies of a given phenomenon. It can be used to assess how well the theoretical distribution fits the empirical distribution obtained from the sample under the null hypothesis that there is no significant difference between the observed (experimental) and theoretical (hypothetical) frequencies^[45]. The chi-square statistic is calculated by the formula:

$$X^2 = \sum \frac{(O - E)^2}{E}$$

Where, O = observed values of a variable, E = Expected Value of a variable and \sum equals the summation sign.

A strong fit exists between theory and experiment if the computed value of chi is smaller than the corresponding tabulated value obtained. This indicates that sampling fluctuations or chance can be blamed for the difference between the observed (experimental) values and the expected (theory) values. The difference between observed and expected frequencies, however, cannot be explained by chance if the computed value of chi is larger than the tabulated value^[46]. As a result, we can say that the experiment does not support any theory. The Statistical Package for Social Science (SPSS) version 21 was used to analyze the data.

4. Results and Discussion

4.1. Descriptive Analysis of Socio-Economic Factors Influencing the Adoption of E-commerce in Nigeria

The demographic profile of respondents is critical for understanding the factors influencing e-commerce adoption in Nigeria. By studying key demographic variables such as age, gender, education level, and occupation, this study sheds light on the respondents' various characteristics. These characteristics in conformity with UTUAT aid in finding patterns and trends that may influence people's willingness and capacity to interact with e-commerce platforms. The following sections provide a thorough demographic breakdown of the respondents to better understand their profile in relation to e-commerce adoption.

4.1.1. Respondents' Gender Distribution

The gender distribution trend of respondents in **Table 1** shows a significant predominance of male participants, with 63.39% (213 respondents) identifying as male, compared to 36.61% (123 respondents) identifying as female. The results demonstrate that there are more males adopting e-commerce services than females which has policy

implications and justification for the low attitude of the female gender towards e-commerce in Nigeria. The result is in contrast with Massamba et al. (2024)^[5] who found a slight skew towards female engagement with e-commerce in Congo Brazzaville.

4.1.2. Respondents' Age Distribution

Table 2 shows that 32.14% (108 respondents) representing the majority of the respondents were between the age bracket of 31–40 years, highlighting that a significant portion of the population engaging with e-commerce is relatively young, while 6.25% (21 respondents) representing the minority group of the respondents were in the age range of 60 and above years. This reduced representation across older age groups suggests a potential gap in e-commerce adoption among older populations, perhaps due to variables such as digital literacy, access to technology, or comfort with online shopping platforms^[7]. The age-related trend observed in the sample demonstrated that 14.29% (48 respondents) fall within the age bracket of 20–30 years, indicating that young adults are also active in e-commerce, though less than those in the 31–60 age range. This suggests that early career stages and student populations are important but may have lower purchasing power compared to slightly older groups.

Table 1. Gender of the Respondents.

Gender	Males	Females	Total
Frequency	213	123	336
Percentage	63.39	36.61	100

Source: Field Survey, 2025.

Table 2. Age distributions of respondents.

Ages	20–30	31–40	41–50	51–60	Above 60	Total
Number	48	108	96	63	21	336
Percentage	14.29	32.14	28.57	18.75	6.25	100

Source: Field Survey, 2025.

Overall, the data indicates that youths are more likely to embrace and use e-commerce technology than the elderly population. This age distribution underscores the importance of targeting younger, tech-savvy persons in e-commerce efforts, along with assessing how to make technology accessible for older consumers. The older generation prefers face-to-face buying and selling over typing on a computer

keyboard and conducting online transactions. The result is in alignment with the Technology Acceptance Model (TAM), UTUAT and a number of research, including Ghazaleh and Abdallah (2024)^[15], Massamba et al. (2024)^[5], and Nguyen et al. (2025)^[6], who discovered comparable outcomes in the United Arab Emirates, Congo Brazzaville, and Vietnam, respectively.

4.1.3. Level of Education of the Respondents

It has been acknowledged that understanding how to use a technology or a component of an information system is critical for maximizing its benefits. The researcher analyzed the educational levels of respondents to explore factors influencing consumer trust in adopting e-commerce in Nigeria. The findings are summarized in **Table 3** below.

The educational background of respondents in **Table 3** reveals a highly educated sample, with 30.34% (102 respondents) of the 336 respondents holding a first degree or a Higher National Diploma as their highest level of educational attainment, while 13.39% (45 respondents) have at least a secondary school leaving certificate. The findings show that all respondents have a strong academic background and a basic understanding of online transactions. This distribution implies that e-commerce adoption in Nigeria is predominantly driven by people with higher education levels, implying that education is likely to play an important role in encouraging consumer trust and engagement with online buying sites. The tiny proportion of respondents with lower educational attainment demonstrates possible impediments to e-commerce adoption among less educated groups. According to the survey results, the majority of respondents agreed that a lack of proper knowledge of computers and ICT is a major obstacle to implementing e-commerce in Nigeria. The finding is congruent with technology awareness and perceived ease of use constructs of the UTUAT and TOE framework and those of Prastiawan et al. (2021)^[34], Hendricks and Mwapwele (2023)^[13], and Loo et al. (2024)^[10].

4.1.4. Familiarity with E-Commerce

The respondents were asked to indicate whether they are familiar with e-commerce. 95.54% (321 respondents) of the 336 respondents answered in the affirmative, while the remaining 4.46% (15 respondents) were not conversant with e-commerce and therefore unwilling to embrace and practice such technology. The opinion of respondents on frequency of e-commerce rate of use displayed in **Table 4** suggests that 47.32% (159 respondents) representing the majority of respondents visit e-commerce sites quite often, 26.79% (90 respondents) occasionally visit e-commerce sites, 21.43% (72 respondents) always visit e-commerce sites while 4.46% (15 respondents) have never visited any e-commerce sites. The findings are consistent with technology awareness and awareness of e-commerce constructs of UTUAT and TOE

and previous research by Prestiawan et al. (2021)^[34], Bening et al. (2023)^[30], and Etim and Daramola (2023)^[39], respectively.

4.1.5. Number of Years of E-Commerce Usage

Respondents were further asked to indicate the number of years they have adopted the usage of e-commerce. Based on **Table 5** outcome, 50.89% (171 respondents) representing the majority of the respondents had 1–5 years' experience of using e-commerce services while 10.71% (36 respondents) representing the minority have adopted e-commerce services for the past 16 years and more. The result which aligns with the theoretical postulations of UTUAT and TOE, shows that the majority of the respondents have adopted e-commerce services for quite a long time and might therefore have experience regarding the usage of online transaction activities. Rathod (2020)^[33], Fonseca et al. (2022)^[27], and Ganguly (2022)^[35], also reported similar findings in the studies.

4.1.6. Respondents' Occupational Distribution

Table 6 shows that out of the 336 respondents, 36.61% (123 respondents) were public servants, 27.67% (93 respondents) were self-employed, 26.79% (90 respondents) are working in private institutions or organizations while the remaining 8.93% (30 respondents) were students. The result indicates that the majority of the respondents are employed (income earners), and can afford internet services. The result agrees with UTUAT and TOE construct of facilitating condition and perceived cost acceptability and extant findings of Pandey and Kumar (2022)^[45], Adam and Alhassan (2023)^[40], Loo et al. (2024)^[10], respectively.

4.1.7. Activities Performed by Respondents Using E-Commerce

Respondents were asked to indicate the kind of activities performed using the internet. The results in **Table 7** show that 41.96% (141 respondents) representing the majority of the respondents say for business transactions, 24.11% (81 respondents) say for social media marketing, 22.32% (75 respondents) of the respondents for disseminating information and the remaining 11.61% (39 respondents) say for target advertising. The results suggest that most of the respondents embrace e-commerce for business transactions followed by social media marketing, advertising information and target marketing respectively. The finding is in consonance with the TOE and Prestiawan et al. (2021)^[34].

Table 3. Educational Level of the Respondents.

Level of Education	Secondary	OND/NCE	BSc/HND	Postgraduate	Total
Distribution	45	96	102	93	336
Percentage	13.39	28.57	30.34	27.70	100

Source: Field Survey, 2025.

Table 4. Frequency of E-Commerce Awareness.

Responses	Always	Quite Often	Sometimes	Never	Total
Frequency	72	159	90	15	336
Percentage	21.43	47.32	26.79	4.46	100

Source: Field Survey, 2025.

Table 5. Years of adoption (e-commerce).

Responses	1–5 Years	6–10 Years	11–15 Years	16 and Above	Total
Frequency	171	87	42	36	336
Percentage	50.89	25.90	12.50	10.71	100

Source: Field Survey, 2025.

Table 6. Occupational Status of the Respondents.

Occupation	Civil Servants	Private Company	Self-Employed	Students	Total
Frequency	123	90	93	30	336
Percentage	36.61	26.79	27.67	8.93	100

Source: Field Survey, 2025.

Table 7. Performed Activities with E-Commerce.

Occupation	Business Transaction	Social Media Marketing	Disseminating Information	Target Advertising	Total
Frequency	141	81	75	39	336
Percentage	41.96	24.11	22.32	11.61	100

Source: Field Survey, 2025.

Internal environments, rather than external ones, pose a barrier to the effective implementation of online transaction activities in Nigeria. According to the study’s findings, the majority of businesses are simply self-employed or family-owned. The size and resources of various businesses determine whether or not computers are used. It also emerged that some organizations lacked the necessary computer skills. Some respondents explicitly stated that they are not computer literate and thus not receptive to e-commerce services.

4.1.8. Respondents’ Understanding of E-Commerce

Respondents were asked to explain how they understand e-commerce usage. According to **Table 8**, 38.39% (129 respondents) of the 336 respondents used the internet to make

payments for goods or services via Automated Teller Machine (ATM)/Point of Sale (POS), 53.57% (180 respondents) for buying and selling goods and services, and the remaining 8.04% (27 respondents) for buying, selling, and making payments for goods and services. The results which are in agreement with TOE and findings of Ganguly (2022)^[35], Hussian et al. (2023)^[18], explicitly show that the majority of respondents who have used e-commerce are familiar with its capabilities and comprehend how to use it.

4.1.9. Devices Used for E-Commerce Services by Respondents

Respondents were asked to specify which devices they use for e-commerce services. According to **Table 9**, 86.64% (291 respondents) of respondents use mobile phones and

ATMs, with the remaining 13.40% (45 respondents) using personal computers and public cafes. This data shows that the majority of respondents prefer to use ATMs and their mobile phone devices for online transactions because very few of them can afford to purchase a personal computer. The majority of respondents cited the high cost of computers as a barrier to adoption. Unfortunately, this has led to the proliferation of cyber cafés, which charge exorbitant

hourly rates despite inadequate computers and poor internet connectivity. The lack of computers at the organizational level, as well as the relatively high cost of internet services, pose significant challenges to the establishment of effective e-commerce initiatives in Nigeria. The result is supported by extant studies of Rathod (2020)^[33], Prestiawan et al. (2021)^[34], Alam et al. (2023)^[31], and the perceived ease of use construct.

Table 8. Respondents Understanding of E-Commerce.

Response	Frequency	Percentage
Buying of goods via internet	108	32.14
Selling of goods via internet	72	21.43
Making payment via internet	129	38.39
All the above	27	8.04
Total	336	100

Source: Field Survey, 2025.

Table 9. Devices Used for E-Commerce.

Response	Frequency	Percentage
Mobile Phones/Smart phones	135	40.18
Personal Computers/Desktops	18	5.36
Public Café	27	8.04
Automated Teller Machine (ATM)/POS	156	46.40
Total	336	100

Source: Field Survey, 2025.

The use of smartphones for e-commerce aids in business growth because users can now reach out at any time using their mobile phones. Businesses can also reach out directly to customers by using smartphones instead of going to the store, saving time and money. Buyers can screen multiple items on smartphones, making the buying and selling process much easier. However, because mobile phones lack large screens and navigation capabilities, buying and selling activities are sometimes limited.

4.2. Descriptive Analysis of the Challenges Associated with E-Commerce Adoption in Nigeria

The rapid expansion of e-commerce services has increased supply chain efficiency, promoting positive client relationships, information sharing, and revenue generation for businesses. This has made it easier to conduct business online and connect suppliers and consumers via more efficient channels. These businesses never close, allowing customers

to place orders and purchase products online at any time they have internet access. Because these online shops have a large inventory and number of products in stock, their profits and revenue exceed those of physical stores. Nonetheless, several obstacles have been discovered in this study that prevent the swift introduction of e-commerce in Nigeria; a few of which are discussed below:

4.2.1. Effect of ICT Infrastructure

From **Table 10**, it is evident that 76.78% (258 respondents) representing the majority of the respondents strongly agreed/agreed that inadequate ICT infrastructure is a major barrier limiting the rapid implementation of e-commerce services in Nigeria, while 21.43% (72 respondents) disagreed/strongly disagreed. Countries typically start at very different points in the process of developing their digital infrastructure to facilitate the growth and dispersion of e-commerce applications. In consonance with UTUAT and TOE theory, low computer literacy also makes it difficult for local and international firms to reach Nigerian consumers. The study’s findings identified

impoverished ICT infrastructure as a significant barrier to the rapid expansion of e-commerce in Nigeria. It has been noted that even in urban areas, broadband connectivity—a crucial element for growth, acceptance, and application—is inefficient and has slow speeds. The adoption of e-commerce in Nigeria is hindered by an epileptic power supply. Nigeria lacks the ICT infrastructure required for widespread e-commerce adoption, or the little that is available is untrustworthy, slow, and costly, especially in rural areas. Furthermore, there’s no use in attempting to market goods that cannot be distributed to the

customer’s preferred location for an acceptable price. It’s not an issue for digital products, but the majority of developing-country exports are materials rather than digital. Electronic transactions frequently raise expectations for expedited delivery, making transport and telecommunications infrastructure even more important for the growth of e-commerce. The policy lesson is that improving ‘ancient’ challenges such as efficient roads, telecommunications, and rail links, port facilities, and quick customs clearance is critical for running an evolving economy.

Table 10. Technological infrastructural impact.

Responses	S. Agree	Agree	Neutral	Disagree	S. Disagree	Total
Distribution	87	171	6	45	27	336
Percentage	25.89	50.89	1.79	13.39	8.04	100

Source: Field Survey, 2025.

4.2.2. Effect of the Cost of Implementation

Table 11 indicates that 70.54% (237 respondents) of the respondents strongly agree/agree that high cost of implementation negatively affects e-commerce acceptance in Nigeria while 26.78% (90 respondents) disagree/strongly disagree. According to the responses, the relatively high cost of implementation impedes the success of e-commerce in Nigeria, necessitating the provision of cheaper internet connectivity. Both service providers and consumers of Internet-based services need new skills. The lower the skills base, the higher the cost of implementing information technology and training in Nigeria; and a lack of information about consumer behaviour is a variable that can be used to justify the introduction of e-commerce by firms in developing countries. The result is congruent with the theoretical framework of UTUAT and TOE and findings of Giang et al. (2024)^[16], Sandu et al. (2025)^[7], and Nguyen et al. (2025)^[6].

4.2.3. E-Commerce Users Information Confidentiality

From findings in **Table 12**, 85.73% (288 respondents) strongly agree/agree that the confidentiality of users affects the acceptance of e-commerce services in Nigeria, while 11.63% (39 respondents) disagree/strongly disagree with the opinion that the lack of confidentiality of users’ information constitutes a significant hindrance to the rapid implementation of e-commerce services in Nigeria. According to the study’s findings, a greater proportion of respondents said they would never feel comfortable sharing personal information online, which keeps them from making online purchases. Some people are hesitant to post their personal information online because of recent problems with cybersecurity, abduction, and other security-related issues in Nigeria. Sinali et al. (2022)^[29], Pandey and Kumar (2022)^[45], and Giang et al. (2024)^[16] reported comparable results in the studies.

Table 11. Respondents’ views on the costs of implementation.

Responses	S. Agree	Agree	Neutral	Disagree	S. Disagree	Total
Distribution	129	108	9	54	36	336
Percentage	38.39	32.15	2.68	16.07	10.71	100

Source: Field Survey, 2025.

Table 12. Confidentiality of E-Commerce Users’ Information.

Responses	S. Agree	Agree	Neutral	Disagree	S. Disagree	Total
Distribution	162	126	9	27	12	336
Percentage	48.21	37.50	2.68	8.03	3.58	100

Source: Field Survey, 2025.

4.2.4. Adverse Effects of Online Fraud and Trust Deficit on E-commerce

From the findings in **Table 13**, 73.22% (246 respondents) of the respondents strongly agree/agree that the fraudulent activities, such as identity theft, internet hacking and lack of trust associated with e-commerce services constitute a major impediment to the prompt implementation of e-commerce services in Nigeria while 24.1% (81 respondents) disagree/strongly disagree with this viewpoint. The findings supported the contention that online fraud and trust deficits pose a significant threat to the success of e-commerce adoption in Nigeria. Furthermore, frequent instances of online crime, such as hacking, encryption cracking, information snooping, identity theft, and so on, are stark reminders of many users' hazy understanding of internet ethics. Although these acts are similar to real-life criminal behaviour such as theft, forgery, fraud, and so on, many people fail to recognise the connection. This is frequently attributed to the medium's immediacy, lack of face-to-face interaction, and perceived anonymity. Extant studies of Giang et al. (2024)^[16], Ghazaleh and Abdallah (2024)^[15], and Massamba et al. (2024)^[5] reported similar results. Another significant barrier to the development and spread of e-commerce activities in Nigeria is the lack of social and penal deterrents.

4.2.5. Effect of Low Internet Penetration in Nigeria

Table 14 shows that 72.32% (243 respondents) of the respondents strongly agree/agree that low internet penetration constitutes a significant challenge to e-commerce adoption in Nigeria, while 24.11% (81 respondents) of the respondents disagree/strongly disagree with this assertion. A significant percentage of survey respondents confirmed that low Internet penetration in Nigeria is a major barrier to the success of e-commerce adoption in Nigeria. However, the government can help to bridge this gap by providing financial and regulatory support in the form of funding to provide affordable and readily available internet connectivity in Nigeria's schools and other important locations. The study's findings are consistent with the theoretical arguments of UTUAT and TOE, revealing that internet penetration remains low, and the cost of internet access is prohibitively expensive for the rapid growth of e-commerce services in Nigeria. Most small and medium-sized businesses in Nigeria lack the income needed to purchase telephone and broadband services, as do other

low-income organizations in most rural areas. Most small and medium-sized businesses in Nigeria make much less money each month than they do from the purchase and upkeep of computers and internet access. Therefore, one of the obstacles to the rapid expansion of e-commerce in Nigeria is believed to be the exorbitant cost of internet services. Such businesses charge exorbitant and frequently unaffordable rates for calls and broadband connectivity. One important factor influencing how much people and businesses use the Internet and e-commerce is the cost of Internet access. Consequently, regulations that encourage effective competition and continuous expansion in infrastructure, network services, and applications across various technological platforms in Nigeria are necessary for the development of broadband markets, inventive and efficient supply arrangements, and efficient use of broadband services.

4.2.6. Effects of Merchandise Quality on E-Commerce Adoption

Table 15 displays the responses of the respondents on the effect that the quality of merchandise has on embracing e-commerce in Nigeria. 66.07% (222 respondents) of the respondents agree/strongly agree that uncertainty about the true quality of the goods and delay in the delivery of goods impact negatively on e-commerce acceptance in Nigeria, while 32.14% (108 respondents) of the respondents strongly disagree/disagree with this declaration. Buyers must be confident that the product they are purchasing meets the desired specifications. Product specifications are becoming more complex as industrialized economies impose regulations governing product safety and labelling, as well as labour and environmental standards^[5, 15]. This makes e-commerce purchases riskier for the buyer. Customers, like in all other forms of commerce, must be assured that if something goes wrong, they will be compensated. The seller's guarantee might need to be more. Online ADR (alternative dispute resolution) systems that provide quick, affordable resolution for contentious transactions can potentially improve e-commerce. These procedures are meant to support slow and costly court adjudication, not to take precedence over it. Online marketers in Nigeria use return policies, which allow customers to return defective products within a set amount of time, to lessen these effects. By implementing this policy, the uncertainty that deters people from making online purchases will decrease.

Table 13. Effects of fraud on the adoption of e-commerce.

Responses	S. Agree	Agree	Neutral	Disagree	S. Disagree	Total
Distribution	129	117	9	54	27	336
Percentage	38.39	34.83	2.68	16.07	8.03	100

Source: Field Survey, 2025.

Table 14. Responses on the effect of low Internet access.

Responses	S. Agree	Agree	Neutral	Disagree	S. Disagree	Total
Distribution	135	108	12	54	27	336
Percentage	40.18	32.14	3.57	16.08	8.03	100

Source: Field Survey, 2025.

Table 15. Responses on the effects of quality/delivery of merchandise.

Responses	S. Agree	Agree	Neutral	Disagree	S. Disagree	Total
Distribution	102	120	6	45	63	336
Percentage	30.36	35.7	1.79	13.39	18.75	100

Source: Field Survey, 2025.

Other barriers to online shopping include a dearth of good income because the majority of people in the countryside are poor, as well as a lack of proper computer and internet education. E-commerce also necessitates low-cost, dependable, and efficient payment methods. While various solutions to the problem of payments for e-commerce transactions are being developed, banks in developing countries must participate in making these payment system characteristics a criterion for assisting firms in gaining access to Nigerian markets. Credit cards are important facilitators of e-commerce as they provide a credible payment channel for online transactions. The inevitable cultural and moral conflict is becoming a more significant issue in the globalization of the Internet. Consequently, attempts to implement worldwide standards that are acceptable to all governments have frequently failed. The Internet has given critics plenty to be afraid of, including an excess of strange religions, excessive

sex, and extreme political beliefs^[31].

4.3. The Impact of E-Commerce on Social and Economic Conditions in Nigeria

The impact of e-commerce on Nigeria’s social and economic conditions is covered in this section of the study. Because e-commerce is international and cross-border, consumers benefit from a wider range of products and sellers as well as the flexibility to shop online from anywhere. Nigerian businesses can save a lot of money on marketing, advertising, and communication by implementing e-commerce. Additionally, it can facilitate the delivery of goods and services to numerous locations across the globe and speed up supply chain procedures. **Table 16** shows how the adoption of e-commerce in Nigeria has impacted social and economic development, as examined in this study.

Table 16. The impact of e-commerce on socio-economic conditions in Nigeria.

S/No.	Social and Economic Conditions	SA	%	A	%	NS	%	SD	%	D	%
1	Creation of jobs opportunities	123	36.61	156	46.43	6	1.79	12	3.57	39	11.61
2	Poverty reduction in the country	93	27.67	159	47.32	6	1.79	27	8.04	51	15.18
3	Fosters inclusive growth and development	129	38.39	126	37.50	12	3.57	45	13.40	24	7.14
4	Improved access to global market	111	33.04	162	48.21	9	2.68	21	6.25	33	9.82
5	Increased turnover and profit	117	34.82	132	39.28	12	3.57	27	8.04	48	14.29
6	Low barriers to entry/24/7 access	105	31.25	111	33.04	18	5.36	54	16.07	48	14.29
7	Reduced prices for customers	129	38.39	135	40.18	9	2.68	24	7.14	39	11.61
8	Improved standard of living	114	33.93	129	38.39	12	3.57	18	5.36	63	18.75

Source: Field Survey, 2025. Where SA = Strongly Agree; A = Agree; NS = Not sure; SD = Strongly Disagree, and D = Disagree.

1. Respondents were asked if e-commerce has increased job opportunities for the population. According to **Table 16**, out of 336 respondents, 46.43% (156 respondents) agreed, 36.61% (123 respondents) strongly agreed, 3.57% (12 respondents) strongly disagreed, 11.61% (39 respondents) disagreed, and the remaining 1.79% (6 respondents) were unsure. The findings clearly show that e-commerce has created job opportunities for a diverse range of individuals across the country. The advent of e-commerce has created opportunities for the country's next generation of creative young people, who will contribute to the country's technological growth. ICT boosts the proportion of locally produced goods and services, makes better use of local resources, raises the proportion of domestic value added, and creates more job opportunities.
2. Respondents were asked if e-commerce contributes to poverty reduction in their country. **Table 16** shows that 47.32% (159 respondents) of the respondents agreed, 27.63% (93 respondents) strongly agreed, 15.18% (51 respondents) disagreed, 8.04% (27 respondents) strongly disagreed, and 1.79% (6 respondents) remained neutral. This information indicates that e-commerce has a positive impact on economic activity by assisting in poverty reduction within the country. ICT improves e-commerce efficiency by providing access to new markets or services, which creates favourable conditions for income generation in Nigeria, reducing poverty, improving governance, increasing per capita income, and lowering unemployment rates.
3. The results in **Table 16** also showed that, although 3.57% (12 respondents) of the respondents were neutral or unsure, 38.39% (129 respondents) of the respondents expressed strong agreement that e-commerce promotes inclusive economic growth and development in Nigeria; 37.54% (126 respondents) of the respondents agreed, 13.40% (45 respondents) were strongly opposed, and 7.14% (24 respondents) disapproved. The outcome shows that e-commerce is a real tool that can be used to promote growth and prosperity in Nigeria.
4. When asked if e-commerce has made it easier for them to access a larger or global market, respondents gave a clear indication: e-commerce has indeed made it possible for a large market reach or accessibility. Based on the results in **Table 16**, 48.21% (162 respondents) of respondents which represent the majority of responses answered in the affirmative, 33.04% (111 respondents) of respondents completely concurred, 9.82% (33 respondents) of respondents were opposed, 6.25% (21 respondents) of respondents strongly disapproved, and the remaining 2.68% (9 respondents) of respondents were unsure. Information and communication technology has brought about a major paradigm shift in global e-commerce. Businesses now have more power to participate in the global market, and consumers have more access to buy goods and services from anywhere in the world through e-commerce.
5. Further, respondents were asked if they believed that embracing e-commerce increased turnover and profits for many different types of businesses. According to **Table 16's** responses, the majority view was represented by 39.28% (132 respondents) who firmly concurred, 34.82% (117 respondents) who disagreed, and 16.07% (18 respondents) who strongly disagreed—even though the remaining 3.57% (12 respondents) indicated neutrality. Because of ICT, e-commerce is now the least expensive way to conduct business in Nigeria because it requires fewer expenses for staff, facilities, and the storage of goods and services. Likewise, e-commerce lowers the costs associated with online transactions in Nigeria by enhancing the rapidity and precision with which entrepreneurs can share information. Businesses that use e-commerce are better able to handle more orders, easily display their products, have fewer obstacles to entry, and spend less on advertising, all of which increase turnover and profits.
6. The responses in **Table 15** also showed that 31.25% (105 respondents) firmly concurred, 16.07% (54 respondents) were strongly opposed, 14.29% (48 respondents) disapproved, and 37.64% (111 respondents) of the respondents supported the claim that e-commerce adoption helps in reducing entry barriers of new firms and provides 24/7 access to business activities. The remaining 5.36% (18 respondents) of the respondents were neutral. According to the majority of respondents, e-commerce has significantly reduced or eliminated entry barriers into various forms of business organizations in Nigeria and enabled businesses to provide

24-h, seven-day-a-week services to their customers who are dispersed throughout the world. Customers can shop online from the comfort of their home, workplace, or any other location with internet access thanks to e-commerce. The development of e-commerce has stimulated the global free flow of goods and services as well as the unrestricted exchange of technology, information, and business establishments.

7. The question of whether online purchasing and selling is less expensive than the conventional in-person shopping method was posed to the respondents. From the 336 respondents, **Table 16**'s responses indicated that 40.18% (135 respondents) of those who responded concurred 38.39% (129 respondents) completely agreed, 11.61% (39 respondents) were opposed, 7.14% (24 respondents) disagreed strongly, and the remaining 2.68% (9 respondents) were unsure. The findings supported the claim that Nigeria's e-commerce adoption has lowered prices for goods and services and raised the country's citizens' standard of living. The use of smartphones, email instead of mail, video conferencing instead of travel to meetings, and e-commerce websites instead of sales catalogs have all contributed to cost savings for businesses in Nigeria through the adoption of e-commerce. With the growing popularity of e-commerce in Nigeria, businesses can now operate from their websites without paying exorbitant rental fees for physical stores and space, which lowers advertising costs, gives them access to a larger customer base, and allows them to handle a higher volume of orders with greater efficiency. All of these benefits add up to a significant decrease in the cost of traded goods and services. By encouraging more suppliers to participate in an electronically open marketplace and lowering operating and transaction costs, e-commerce adoption can benefit consumers.
8. Finally, respondents were asked if they felt that the acceptance of e-commerce had improved their standard of living. The responses from **Table 16** showed that,

of the respondents, 38.39% (129 respondents) agreed, 33.93% (114 respondents) strongly agreed, 18.75% (63 respondents) disagreed, 5.36% (18 respondents) strongly disagreed, and the remaining 3.57% (12 respondents) were neutral. E-commerce adoption can shorten delivery times by utilizing effective integrated computer systems that enable customers to peruse a greater variety of goods and services from the comfort of their homes, offices, or any place with internet connectivity. Nigerians' standard of living has significantly improved as a result of increased access to a wider range of goods and services, increased efficiency, and the production and delivery of goods and services generated by the adoption of e-commerce. It is interesting to note, however, that e-commerce adoption is gradually increasing in Nigeria as a result of significant advances in telecommunication services.

4.4. Hypothesis Testing

Using the Chi-square contingency table that illustrates the observed and expected frequency below, this section of the study examines and tests the null hypothesis, which claims that: There is no significant effect of e-commerce adoption on current socio-economic conditions in Nigeria.

Table 17 produced a calculated Chi-square value of 44.38, and the degree of freedom, obtained by multiplying the number of rows minus one (3 - 1) by the number of columns minus one (5 - 1) is 8 (2 × 4). The critical or calculated Chi-square value at the 99% significance level is 21.96. The calculated Chi-square value (44.38) is greater than the critical value (21.96), so we reject the null hypothesis and accept the alternative hypothesis. The study concludes that e-commerce adoption has a major impact on the better socioeconomic circumstances of Nigerian consumers and businesses. Because of this, the researcher is convinced that the adoption and spread of efficient e-commerce ventures will greatly enhance the socioeconomic standing of Nigerian businesses and consumers.

Table 17. Chi-square contingency table showing observed and expected frequencies of socio-economic conditions in Nigeria.

Economic and Social Conditions	Frequency	SA	A	NS	SD	D	Total
Fosters inclusive growth and development	Observed	129	126	12	45	24	336
	Expected	118	139	11	28	40	336

Table 17. *Cont.*

Economic and Social Conditions	Frequency	SA	A	NS	SD	D	Total
Improved access to global markets	Observed	111	162	9	21	33	336
	Expected	118	139	11	28	40	336
Improved standard of living	Observed	114	129	12	18	63	336
	Expected	118	139	11	28	40	336
Total		354	417	33	84	120	1008

Source: Field Survey, 2025.

5. Conclusions

In today’s constantly changing business environment, e-commerce has transformed the way businesses and consumers engage with the global marketplace, creating huge prospects for economic growth and innovation. Due to the Internet’s explosive expansion, conventional shopping practices are gradually shifting to online platforms. However, e-commerce penetration in developing nations, particularly Nigeria, remains low due to a variety of constraints. Therefore, this study empirically investigated how technological, organizational, and environmental factors influence the adoption and utilization of e-commerce within the integrated setting of the Unified Theory of Acceptance and Utilization of Technology and the Technology–Organization–Environment frameworks and how this acceptance affects Nigeria’s digital transformation process. These models have been used extensively in a variety of settings, but they might not include all the variables required for the e-commerce industry. To overcome this gap and improve these models’ explanations of users’ decisions to embrace and use e-commerce, the study introduced novel characteristics that can assist organizations in making successful digital transformations and increase the model’s power to characterize consumer e-commerce acceptance behaviour.

Through the convenience sampling technique, quantitative data were generated from 336 respondents who conduct business online. Descriptive and inferential statistical tools were deployed for data analysis. The findings revealed that e-commerce is more likely to be accepted by younger generations, the working class, and the majority of urban people. Furthermore, the development of e-commerce in Nigeria has enabled people to shop online from anywhere. The population’s standard of living has significantly improved as a result of increased access to a broader range of goods and services, improved production and delivery efficiency, lower

commodity prices for consumers, and a significant reduction in marketing, advertising, and communication costs associated with the implementation of e-commerce capabilities. Similar to earlier studies in other locations, a variety of socioeconomic, technological, organizational, and environmental factors had a substantial impact on the decision to adopt e-commerce among Nigerian firms and customers.

Inadequate ICT infrastructure. Poor internet connectivity, particularly in rural areas, concerns about transaction security, expensive internet service costs, and e-commerce technology implementation all represent substantial barriers to mainstream e-commerce adoption and utilization in Nigeria. Many respondents report navigation and accessibility issues, emphasizing the challenges posed by inadequate computer proficiency and the need for more user-friendly platforms. The lack of extensive Internet coverage exacerbates these issues, delaying e-commerce growth and restricting customer access in remote areas. The findings also confirm the significance of perceived behavioural control, which emphasizes how important it is to believe in organizational capabilities and internal control when making decisions about the adoption of innovations, which goes beyond earlier research that focused more on technological benefits or cost factors.

The analysis provides useful insights into the barriers to e-commerce adoption by Nigerian businesses and consumers. Consumer hesitation stems mostly from their discomfort with buying products, and building trust and security is critical in increasing the perceived benefit of e-commerce and fostering consumer adoption. The study adds to this concern by identifying an increasing number of security flaws and insufficient safeguards for sensitive information. Furthermore, the survey discovered considerable barriers to customer support and payment alternatives, which could have a negative impact on the perceived ease of use of the e-commerce platform. The hypothesis test result verified that implementing effective e-commerce enterprises can favourably boost the socioeco-

conomic well-being of Nigerian businesses and consumers. To match with digital trends, strategies must be developed, technological skills strengthened, and human resources trained.

The findings have implications for strengthening legislative frameworks, digital infrastructure, and e-commerce trust-building procedures in Nigeria. To increase acceptance of e-commerce in the country, a number of recommendations are made based on the study findings. First, e-commerce enterprises should increase transparency and communication about security procedures. This includes adopting dependable payment solutions that convince customers about the security of their information and transactions. Second, upgrading digital infrastructure is critical: more investment in Internet connectivity, particularly in rural areas, would enhance accessibility to e-commerce. Finally, policymakers play an important role in fostering digital creativity. The government might help to foster a more equitable digital revolution by aggressively promoting the e-commerce sector, enabling appropriate infrastructure, and assuring safeguards for users. Such measures will help to build a more vibrant and inclusive digital economy, establishing Nigeria as a regional leader in e-commerce. Effective coordination between the public and business communities to overcome existing constraints could promote long-term and broad acceptance of e-commerce, benefiting the economy and citizens' well-being.

While this study provides important details, several drawbacks must be addressed. One notable disadvantage is that the hypotheses were tested using a cross-sectional research methodology. Whereas this strategy allows for quick and cost-effective data collecting, it fails to reflect the constantly evolving and long-term processes associated with small and medium-sized firms embracing e-commerce. Future studies should examine the evolution and changes in the desire to use e-commerce over time using longitudinal designs. Additionally, constraints in data collection methods should be considered: The survey sample was chosen using convenience sampling, which may contribute to bias because those who are more interested in the topic are more likely to participate. Data collection was mainly based on self-reported replies, which can be influenced by personal bias, social desirability, or the tendency to present oneself positively. Furthermore, the study's emphasis on Nigeria and lack of representation across industries limit the findings'

generalizability. As a result, future research should try to broaden the scope of participants, including comparisons across industries, geographic regions, or countries at different stages of development, in order to acquire a more thorough knowledge of the drivers and barriers to e-commerce intention.

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Institutional Review Board Statement

This study was conducted in accordance with the ethical principles of research involving human participants. All respondents participated voluntarily, and informed consent was obtained before data collection. The anonymity and confidentiality of participants were assured, and no personal identifying information was collected. The data were used solely for academic research purposes.

The research protocol was reviewed to ensure compliance with ethical standards, and no physical, psychological, or social harm was caused to participants. As this study involved survey-based data without medical or experimental procedures, ethical approval from an institutional review board was not required.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

The study uses primary data sources obtained through a structured questionnaire that is not sensitive in any way to any vulnerable group(s). The questionnaire was administered by the researcher using a convenience sampling technique. The data used for the empirical analysis of this study is contained within the paper.

Conflicts of Interest

In accordance with the ethical standards of academic publishing, the author declares that he has no known competing financial interests or personal relationships regarding the publication of this article that could have appeared to influence the work reported in this study. The author confirms that there are no financial, personal, or professional relationships with other individuals or organizations that could inappropriately influence or bias the content of the paper. This includes employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. Should any potential conflicts arise in the future, the author commits to disclosing them promptly in accordance with the publication's policy.

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