# Verifying persuasive factors boosting online services business within mobile applications

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## ABSTRACT

The study's objective is to investigate factors that contribute to user acceptance and the actual use of mobile apps in the online service. The UTAUT and ETAM models were used in this study, and they facilitated the development of the hypotheses. The hypotheses were that quality, satisfaction, security, performance expectation, effort expectation, facilitating conditions, and social influences impact mobile app acceptance and the actual use of online service. The study used a quantitative case study approach and data collection through surveys. The p values obtained for the seven constructs were lower than the 0.05 and 0.001 significance levels and hence supported the hypothesis developed.

| **Keywords**: | online service, mobile app acceptance, mobile app adoption, technology acceptance, ETAM model, UTAUT model. |
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## 1. Introduction

The modern world is characterized by advanced technology and internet developments as it transformed the world into a global digital village[1]. In recent years, the adoption of technology has been a fundamental critical and distinct aspect of the e-commerce industry. Increased digitization has affected different business activities in organizations, including business models, corporations between companies, the creation of new service and product offerings, and changes in the form of interactions between company employees and consumers[2]. At the same time, the advanced technologies have put pressure on companies across the world to develop strategies that are in line with new opportunities at each phase and thus enhance their competitive advantage [2]. Similarly,[3-5] assert that the internet and technology have consistently reshaped the business landscape and online transactions globally. As a result, businesses are continually making changes to their strategies and business operations and adopting measures that are fundamental to improving their processes and successes. The internet has proved to be an efficient and effective way to communicate with customers for marketing and selling products and services. Parallel to the development of the internet is mobile communications, 4G, and 5G technologies to play a fundamental role in the business environment, more so direct marketing. According to [6-8, 4], 5G technologies enable businesses and companies to operate and overcome shortcomings with existing communication technologies. Advanced technologies and the internet have led to the emergence of e-commerce, which concerns the buying and selling of services and goods over the internet as well transfer of data and money over the internet to allow for the execution of transactions. In most cases, e-commerce is about the use of the online platform to sell physical products; however, it can also be utilized to describe any commercial transactions that are facilitated through the internet.  The e-commerce in the United States has significantly evolved from the first instance recorded in 1995 [9].  The e-commerce itself has changed from online retail sales to broader measures such as the online sale of unique services not available in the physical world[10]. Small business owners, large businesses, and independent freelancers have successfully benefited from e-commerce as the platform has provided means to effectively sell their products and services to a large customer base as opposed to the offline retailers. Notably, the growth of e-commerce is projected to further increase and become the fasted growing form of commerce. In line with the development of e-commerce is the advanced mobile technology that has increases mobility and access to e-commerce services[10]. Mobile technology has higher opportunities for influencing the successes of businesses operating from online platforms [11-14]. The number of people who own smartphone devices is swiftly increasing across the world, with 81 percent of the US

population owning one. One way for online businesses to remain competitive is through the use of mobile apps. Mobile applications (apps) are increasingly being used in online retail markets rather than websites[12]. Therefore, companies develop mobile applications in line with their daily operations and aim to reach a broader customer[15]. Recent technologies have prompted many businesses to incorporate different perspectives and develop activities necessary, promoting interactions with customers. Notably, mobile apps have been argued to make it easier for consumers to make purchases online. The adoption of mobile apps by marketers and consumers can increase market share, consequently revenue generation. However, companies need to attract more customers as well as promote the retention of existing customers to remain competitive. Customer satisfaction is one critical aspect that should realize while having customers to use mobile applications in e-commerce. Acceptance and satisfaction from the application will increase usability and intended use and revenue generation. Therefore, the study aims to investigate the factors that influence, constraints or promote mobile app acceptance among consumers in e-commerce. Besides, it investigates the extent to which consumers use mobile app resources to maximize online services.

## 2. Literature review

The concept of online service is significant and plays a critical role in e-commerce gives the interactive flow of information [16, 17]. Different industry sectors globally have been affected by the introduction of e-customer services such as financial institutions, transportation, education, governments, retail, and healthcare. The application of e-customer service reduces the cost of services hence the ability to segmenting services into contracts. E-commerce is opposed to offline business transactions and, thus, does not involve face-to-face interactions between business employees and customers [18]. The lack of face-to-face interactions with online services can create levels of dissatisfaction among some customers as some may not feel comfortable using impersonal service with increased preference to face-to-face interactions [19]. Even though there are significant benefits of using e-commerce, there are increased concerns over customer decisions and choices to use the online platforms for their transactions over offline platforms. The metrics used to measure the quality of customer services in online businesses are distinct from the metrics used to measure quality in offline services. A study of [18] was conducted to investigate factors influencing the quality of e-customer service in banking. The study found out that notable factors that determine the quality of e-customer service in the industry are privacy and security, interactivity, content, efficiency, and customer support. The factors influencing the quality of e-customer service make up what consumers expect of e-customer services and, consequently, what companies need to consider developing quality m-banking services. A study of[20, 21] recognizes that technology adoption, such as the use of mobile applications, is critical and has been distinct in e-commerce research; however, there are notable challenges that hamper the adoption of technology in sectors such as banking. According to findings in [22, 23], brand image, customer satisfaction, and e-customer service motivate and influence the intention of customer users to use mobile applications for banking services. Similarly, [24] find that privacy, website design, and fulfillment effect affect the quality of service of e-customer services. The importance of quality e-customer service is also reflected by finding out that the quality of online services determines the successes or failures of an organization as well the experiences of customers in an interactive online environment. The quality of customer services is mainly considered with the delivery of intangible assets such as comparison of product prices, customer ratings, information about products, and tracking of products. Therefore, mobile apps that can meet customer expectations and demands will increase adoption and usability. There are myriad challenges that inhibit the adoption of mobile applications in e-customer services. For instance, [25] state that there are increased concerns over the acceptance of information services from digital platforms during the self of products and services. Customers may not be able to trust the information about the products and services available on applications as opposed to when making physical transactions. Similarly, [26]find that there is an increase in the level of trust issues from consumers alongside the proliferation of electronic commerce and online transactions. The lack of trust from consumers is a significant barrier to the adoption of e-commerce. Therefore, the ability of businesses to ensure customer trust increase the adoption of mobile applications in the e-customer service. The success in the implementation of information systems that constitutes the use of the mobile application is tied with the use of the system[27]. Similarly,[18, 28]find out that user acceptance and confidence all contribute to successes of the implementation of new technologies in e-customer services. However, user acceptance in digital channels and e-services is a challenge for companies to maximize benefits from the technologies[29]. Therefore, policymakers and decision-makers in the different industry sectors need to understand the various factors that affect customer acceptance of mobile applications to enhances successes in their move from the traditional system to electronic platforms. Most firms make decisions to invest in mobile

apps in the e-customer service to expand the effectiveness and efficiencies of their performances [30-32]. Therefore, it is fundamental for organizations to identify with the root causes and factors that influence the decision of consumers to use mobile apps for e-customer services [15]. Identification of these factors and incorporation in the development of the mobile applications will increase user acceptance and consequently successes and achievement of intended goals. Several research studies have investigated the quality of services that customers expect from e-commerce, such as privacy, security, website design, interactivity, customer support, efficiency, and interactivity [12]. The factors are prudent in enabling the customers to get the satisfaction demanded, just like in face-to-face transactions. Recently, different industry sectors are adopting the use of mobile applications as a means to increase access to e-service[22],[30, 31]. The literature also shows there are concerns over factors that negatively influence the adoption of mobile applications [16, 18, 33]. A study of[27, 29-31] recognizes the importance of considering consumer acceptance over technology adopted in e-services as they influence the use and, consequently, successes. However, no research has investigated the acceptance of mobile applications in online services.

## 3. Research model

A combination of the unified theory of acceptance and use of technology (UTAUT) model and the extension of the TAM (ETAM) model implies that facilitating conditions, social influences, effort expectancy, and performance expectancy, as well as quality, security, and satisfaction, are the factors that influence user acceptance of the technology. The performance expectancy is the user-perceived usefulness, while effort expectancy is the use of use. Facilitating conditions include resources such as time and money needed to use the technology while the perception and belief of the social condition of what other people think about the technology. The factors influencing acceptance from the UTAUT model translates to quality and satisfaction in the ETAM model. The aspect of security in the ETAM model is not highlighted in the UTAUT models hence the need to consider it in investigating mobile app acceptance in the online service. This research incorporates aspects from both the UTAUT and ETAM model; therefore, the framework that will be used is as illustrated in Figure 1.
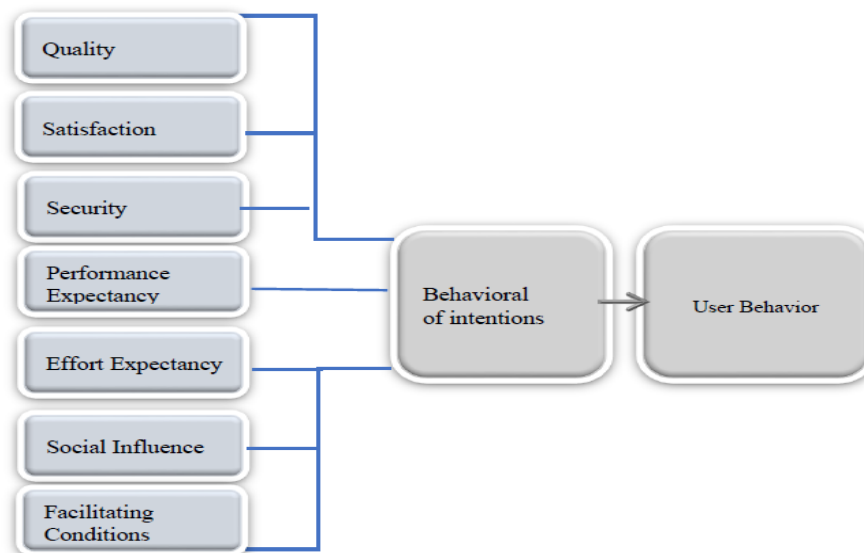


Figure 1. Research Model

## 4. Research methodology

### 4.1. Study design

According to [34], research paradigms are fundamental in research as they outline the different assumptions and measures used in the study. This research will use a positivist paradigm that assumes that realities are measurable. Therefore, the study will use a quantitative approach to measure the level of mobile app acceptance among consumers in the online service. The approach is prudent as it necessitates the testing of the hypothesis developed from the theories to measure truths objectively. The quantitative approach dictated by the positivist

approach uses empirical measures in investigating phenomena using statistical, computational, and mathematical methods[35]. According to[36], the empirical observations made in quantitative studies make a connection with the hypotheses developed and hence the objective determination of truths of phenomena being studied. In this study, the empirical observations on quality, satisfaction, security, effort expectancy, performance expectancy, facilitating conditions, and social influenced will be measured and evaluated to determine whether they are in line with the hypotheses developed. Additionally, the research will use a deductive reasoning approach, as it facilitates the investigation of whether or not a hypothesis should be accepted.

## 4.2. Sampling and instrumentation

The targeted sample for this research includes consumers using mobile apps or those that have tried using mobile apps in the e-customer service. Hence, the study will use purposive sampling. In research, it is roughly impossible to conduct a study on a whole sample. The appropriate sample size for quantitative research should be between 30 and 50 for levels one and two statistical analyses[37]. The participants will be selected through a convenience sampling technique as the individuals required for the research are those that have or are using mobile apps for online services. The research is descriptive, where data collection will be done through surveys. The study developed a questionnaire that had three sections. The instrument developed considered confidentiality, privacy, and integrity that is required in research [38]. The first section of the questionnaire informed the participants about the study, the benefits of the research, the importance of their participation, their rights, which include opting out of the study. Additionally, the participants were asked not to provide any personally identifiable information as a means of enhancing privacy and confidentiality. The first section also indicated that by agreeing to fill the questionnaires, and then the participants had given consent.

## 4.3. Data analysis and findings

Data collection was done from different sources such as online platforms and social media. Table 1 summarizes the demographic data gathered. One hundred and twenty questionnaires were distributed online to participants. Sixty-nine questionnaires were submitted, out of which 66 were fully completed. Hence, the study used data from 66 participants.

Table 1. Participants (N=66)

| Variable | Description | Number of respondents | Percentage (%) |
|---|---|---|---|
| Gender | Male | 35 | 53 |
| | Female | 31 | 47 |
| Age | 19-23 | 14 | 21.2 |
| | 24-30 | 22 | 33.3 |
| | 31-40 | 18 | 27.3 |
| | Above 40 | 12 | 18.2 |
| E-customer Service | E-government | 15 | 22.7 |
| | M-banking | 22 | 33.3 |
| | Retail E-service | 18 | 27.3 |
| | Others | 11 | 16.5 |
| Experience with the mobile app | Good | 9 | 13.6 |
| | Average | 42 | 63.6 |
| | Bad | 15 | 22.7 |

From the sample above, 53% were male, and 47% were female. The participants aged between 19 and 23 were 21.2%, those aged between 24 and 30 were 33.3%, those aged between 31 and 40 were 27.3% while those above 40 years were 18.2%. Most of the participants used mobile apps for mobile banking (33.3%) followed by retail e-services, 27.3%), and then E-government. However, e-customer services are vast, as illustrated by 15.2% of the participants that admitted using mobile apps for other different – customer services. The data analysis was conducted using AMOS v.17 and SPSS v.22. Notably, the data collected was ordinal since the Likert scale was used and hence non-parametric. Additionally, multivariate factor analysis was used to examine the data. The exploratory factor analysis (EFA) was used to examine the survey data collected using AMOS v. 17. The software also helped in assessing the reliability and validity of the data to ensure that the EFA model was fit for

examining the hypothesis. The minimum Cronbach alpha that is accepted and ensures reliability is 0.6 [39]. Confirmatory factor analysis for all the seven variables was higher than 0.89 hence reliable (see Table 2).

Table 2. Confirmatory Factor Analysis

| Variable | AVE | Composite Reliability | Cronbach Alpha |
|---|---|---|---|
| Quality | 0.78 | 0.94 | 0.94 |
| Satisfaction | 0.75 | 0.91 | 0.91 |
| Security | 0.78 | 0.90 | 0.90 |
| Performance Expectation | 0.79 | 0.93 | 0.93 |
| Effort Expectation | 0.76 | 0.91 | 0.91 |
| ocial Influences | 0.71 | 0.92 | 0.92 |
| Facilitating Conditions | 0.73 | 0.90 | 0.90 |

The validity of convergent is verified when the factor loading and average variance extracted (AVE) are greater than 0.5, and that the composite reliability is higher than 0.6 [40]. The square roots of AVE can be calculated to assess discriminant validity, and higher square root values were obtained, as illustrated in Table 3. The constructs investigated met the minimum value in discriminant and convergent hence reliable.

Table 3. Discriminant Validity

| Construct | Q | Sa | Se | PE | EE | SI | FC |
|---|---|---|---|---|---|---|---|
| Q | 0.87 | | | | | | |
| Sa | 0.33 | 0.89 | | | | | |
| Se | 0.51 | 0.37 | 0.84 | | | | |
| PE | 0.32 | 0.23 | 0.28 | 0.86 | | | |
| EE | 0.60 | 0.49 | 0.23 | 0.30 | 0.88 | | |
| SI | 0.28 | 0.24 | 0.42 | 0.27 | 0.38 | 0.83 | |
| FC | 0.63 | 0.51 | 0.20 | 0.34 | 0.39 | 0.31 | 0.85 |

Under examining the hypotheses, Table 4 plots the parameter gauges with more point by point findings on the impacts of every autonomous variable. The p values obtained were lower than the 0.05 and 0.001 significance levels used. Therefore, all the constructs, which include quality, satisfaction, security, performance expectation, effort expectation, facilitating condition, and social influences, significantly affected acceptance and actual use of mobile apps in the online service.

Table 4. Examining Hypotheses

| Hypothesis | Coefficient (B) | T-Value | Significance | Support |
|---|---|---|---|---|
| H1: Q increases acceptance and actual use of mobile apps in online services | 0.589** | 11.531 | P<0.001 | √ |
| H2: Sa increases acceptance and actual use of mobile apps in online services | 0.687** | 8.215 | P<0.001 | √ |

| Hypothesis | Coefficient (B) | T-Value | Significance | Support |
|---|---|---|---|---|
| H3: Se increases acceptance and actual use of mobile apps in online services | 0.19* | 8.692 | P<0.05 | √ |
| H4: EE increases acceptance and actual use of mobile apps in online services | 0.431** | 13.678 | P<0.001 | √ |
| H5: PE increases acceptance and actual use of mobile apps in online services | 0.13* | 7.875 | P<0.05 | √ |
| H6: SI increases acceptance and actual use of mobile apps in online services | 0.463** | 7.541 | P<0.001 | √ |
| H7: FC increases acceptance and actual use of mobile apps in online services | 0.345** | 9.434 | P<0.001 | √ |
| *Indicate measures at | 0.5 | level | of | sig. |

** indicate measures at 0.001 level of sig.

## 5. Discussion

The research aimed to investigate the factors affecting mobile app acceptance in the online service. The specific objectives include an examination of the different factors promoting or constraining acceptance of mobile apps and the extent to which actual use of mobile apps by consumers maximizes the company's online services. Numerous studies such as[16], [22], [41] confirm that mobile app in e-customer services significant advantages for businesses including enhancing the interactive flow of information, improve service segmentation, saves the cost of customer services, strengthening relationships with consumers, saving on time, provides access to complete information, simple, and increases access to a wide range of services and products. However, some studies find mobile apps in e-customer services to have limitations such as lack of a face to face interactions [16], poor quality mobile apps such as compromise to privacy [24], inability to accept information in shared[25], and trust issues [26]. User acceptance of mobile apps in e-customer service is fundamental hence the need for the counter to the shortcomings and challenges concerning their use[18],[27], [29]. This study employed the ETAM and the UTAUT models and identified seven hypotheses for the examination of user acceptance of mobile apps in online services. The hypothesis examined seven different constructs, which include quality, satisfaction, security, performance expectancy, effort expectancy, functional conditions, and social conditions. The results from the confirmed the hypotheses developed that quality of mobile apps, user satisfaction, security offered by the mobile apps, social influences, facilitating conditions, ease of use, and usability influenced by the acceptance of mobile apps in online services. The positive variables in the constructs contribute to the acceptance and successful implementation of mobile apps in online services. In contrast, the negative variables contribute to the poor implementation of mobile apps. For example, user-friendliness, interactivity, poor design, usability, trust, ease of use, speed of service delivery, and customer support all contribute positively to mobile app acceptance. On the other hand, negative variables such as poor design, lack of security, slow service delivery through apps, and inefficient customer support, among others, lead to low or zero acceptance of the mobile apps in online services. Ensuring all positive aspects outlined from the different constructs will extensively influence acceptance and the success of mobile app implementation.

## 6. Conclusion

The research has effectively illustrated that mobile app acceptance is essential for their successful implementation in the online service in all industries. The outcome of the study has increased knowledge for designers and companies on what factor they need to consider when developing mobile apps for use in online services to promote maximum usability and profitability for companies. The study has contributed positively to literature as it has provided scientific evidence supporting the use of mobile apps in online services. The scientific evidence outlines the factors that need to be considered when developing mobile apps to increase customer acceptance and actual use. This research has investigated mobile app acceptance from the perspective of the customers. There is, therefore, for additional research to investigate mobile app acceptance in online services from employees' perspective as they also use the apps to provide services as demanded by the customers. The research will be prudent to ensure the development of comprehensive apps that meet the needs

of all users. Additionally, there was a limitation with the sample size used, considering it used a factorial analysis. In this case, there is a need to perform another similar study with a large sample size with more than 300 participants.

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