

**M-SHOPPING APPLICATION'S CONSTRUCT: MODELLING PROXIMITY AND
ROUTE MAP WITH REGARD TO CONSUMERS' M-SHOPPING BEHAVIOUR IN
KENYAS NAIROBI METROPOLITAN REGION**

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OF THE DEGREE OF MASTER OF SCIENCE IN COMPUTER INFORMATION
SYSTEMS OF KENYA METHODIST UNIVERSITY**

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DECLARATION AND RECOMMENDATION

Declaration

This thesis is my original work and has not been submitted to any other university for academic award.

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Recommendation

This thesis has been submitted with our approval as the appointed university supervisors.

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DEDICATION

To my late parents Mr. and Mrs. Ndolo. My guardian Rev. Dr. Philip Muinde. Friends Shadrack, Stephen, Elizabeth and Faith. Colleagues Julius and Ernest.

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ABSTRACT

Mobile shopping only relates to specific elements of the purchase process, mostly in business-to-consumer and consumer-to-consumer scenarios. M-shopping is one of the most popular online pastimes in the world, with e-commerce sales reaching 4.28 trillion US dollars globally in 2020 and revenues predicted to reach 5.4 trillion US dollars in 2022. Mobile commerce (M-commerce) diverges from traditional electronic commerce (E-commerce) due to disparities in its user interface and the correlated factors of risk, interactivity, ubiquity, localization services, and patterns of usage. Social media is influencing consumer purchase decisions more and more, overshadowing conventional opinions on goods and services. This study sought to assess proximity and route map with regard to consumers' M-shopping behavior in Kenya Nairobi Metropolitan Region. The objectives of the study were; to investigate place convenient modelled in the current m-shopping applications, to examine the influence of proximity and route map in the current m-shopping applications and to model proximity and route map in an m-shopping application. A cross-sectional research design was adopted and a sample size of 106 respondents determined using a simple random sampling technique. The primary data was collected through structured survey questionnaires, after which, STATA software was used for its analysis. The study established a statistically significant relationship between the convenient in m-shopping applications and consumer's m-shopping behaviour ($\chi^2=6.370a$, $p=.041<0.05$). A statistically significant relationship between the proximity in the current m-shopping applications and consumer's m-shopping behaviour was also noted ($\chi^2=13.234a$, $p=.001<0.05$). Further, it established a positive statistically significant relationship between the route map in the current m-shopping applications and consumer's m-shopping behaviour ($\chi^2=72.192^a$, $p=.000<0.05$). Analyzing the influence of proximity distance on consumer's behavior revealed that, consumers tend to favor businesses located closer to their current location when making buying decisions through m-shopping applications. Further, provision of vendor-consumer real-time navigation assistance would enhance consumer's behavior. Despite the high deployment of mobile shopping applications, less attention is given to the proximity distance and route map aspects in the mobile shopping landscape. Consequently, this negatively impacts on the consumer's m-shopping behavior. Besides, this study serves as an intervention target for improving the consumer's behavior. It's therefore recommendable that the developers should adopt a holistic and consumer-vendor centered approach to mobile applications. In addition, implementation studies should be employed to test this model and identify other factors that may be useful to effectively improve on the m-shopper's behavior. Future research opportunities lie in exploring advanced technologies such as augmented reality (AR) integration with route maps in M-Shopping applications or analyzing data-driven approaches for personalized recommendations based on both proximity distance and historical buying patterns. By continuously evolving strategies informed by consumer behavior analysis within M-Shopping applications, businesses can stay ahead in meeting the dynamic needs of tech-savvy consumers in markets like Nairobi Metropolitan where digital innovation continues to drive shopping trends forward.

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ABBREVIATIONS AND ACRONYMS

Abbreviation	Meaning
IDR	International Depository Receipt
APIs	Application Programming Interface
AI	Artificial Intelligence
GPS	Global Positioning System
SMEs	Small and Medium Enterprises
GDP	Gross Domestic Product
TAM	Theory of Acceptance Model
TRA	Theory of Reasoned Action
COVID 19	Corona Virus Disease
GA	Genetic Algorithm
TS	Tabu Search
IRL	Inverse Reinforcement Learning
KeMU	Kenya Methodist University
NACOSTI	National Commission for Science, Technology and Innovation
COD	Cash on Delivery
KM	Kilo Meter
OTD	On Time Delivery
OFD	Online Food Delivery

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Mobile shopping only relates to specific elements of the purchase process, mostly in business-to-consumer and consumer-to-consumer scenarios. Customers may utilize the app's handy manner to search, order, find, or transact anywhere and anytime by downloading it from the app store on their smartphone (Ngubelanga & Duffett, 2021). Worldwide, mobile shopping is a major online activity, with e-commerce sales hitting 4.28 trillion USD in 2020 and projected to grow to 5.4 trillion USD by 2022 (Chevalier, 2021). In Indonesia, e-commerce transactions were valued at Indonesian Rupiah (IDR) 81 trillion in 2017, according to the Bank of Indonesia. This figure surged to IDR 146 trillion in 2018 and reached IDR 265 trillion in 2020 (Indiani & Febriandari, 2021). However, online shoppers may use online convenience as a factor to locate things they desire without having to physically visit. Consumers similarly, view the search feature as the main obstacle to efficient and convenient online buying according to Almarashdeh et al. (2019). Kumar and Kashyap (2019) added that the customers' need for convenience has grown as they spend less time buying and more time engaging in other activities, which has centered their interest in online shopping.

In addition, E-commerce has been growing in countries like in Malaysia and is not expected to slow down anytime soon. And in order to showcase, advertise, and sell goods and services both domestically and globally through online store, e-commerce retailers need to make the required arrangements to include this platform into their marketing strategies (Marzuki & Yasin, 2021). Mobile commerce (M-commerce) diverges from traditional electronic commerce (E-commerce) due to disparities in its user interface and the correlated factors of risk, interactivity, ubiquity, localization services, and patterns of usage (Wang et al., 2019). When making

purchases online, security is one of the most important features that consumers look for to protect their personal data. One of the disadvantages of shopping online is that consumers will lose trust if a website lacks security and privacy, which will slow down the expansion of online shopping (Wong et al., 2019). At the most recent 5-year interval, Bangladesh's total internet users climbed by 245%, from 40 to 98 million, between August 2014 and August 2019. (Hossain et al., 2021). Furthermore, as internet access spreads widely throughout Bangladesh's rural areas, online shopping has fostered faster growth and thus has the potential to maintain the trajectory into the future (Rahman et al., 2018).

Many consumers in Bangladesh, particularly in Dhaka, have embraced online shopping and before making an online purchase, consumers examine a number of aspects (Rahman et al., 2018). In sub-Saharan Africa, as a result of Jumia, Takealot, and Konga in the digital landscape, e-commerce is progressively getting the necessary traction (Koranteng et al., 2021). These platforms raise people's quality of life by giving customers access to a wide range of items and by enabling people to easily deploy into their small enterprises (Attakora-Amaniampong et al., 2021). However, since they are worried about product quality, delivery, cybercrimes, and information leaks, users both consumers and store owners are pessimistic (Sarfo & Song, 2021). Social media is influencing consumer purchase decisions more and more, overshadowing conventional opinions on goods and services. Consumers' educational backgrounds have a significant impact on their preference for social media platforms and acceptance of digital payment methods according to (Shani et al., 2023).

Research shows how important payment options are to the uptake of online shopping (Coffie et al., 2021). In Ghana right now, mobile money is the most popular payment option (Yermack, 2018). However, these mobile money payment options are based on an obsolete technology that is uneasy not integrate into the e-commerce platforms for smooth payment processes. FinTech proponents in the sub region should thus take into account the best options (QR codes,

biometrics, and face recognition) that enable simple, safe and transparent e-payment methods so as to improve the status of living through the sustainable adoption of e-commerce (Amofah & Chai, 2022).

In Kenya, the Communications Authority of Kenya estimated that the value of Kenya's e-commerce sector was around Ksh.4.3 billion in 2014. However, with 35.5 million users and an internet penetration rate of 82.6%, Kenya is among the African nations most suited for an explosion in digital commerce. The country already sees Ksh. 3 billion worth of mobile transactions per day, according to data from the Communications Authority. Due to poor fixed-line and PC penetration, cellphones and mobile internet are the primary means of conducting digital transactions in Kenya. But in recent years, the mobile experience has significantly improved, making shopping from a smartphone easy and fun. Mobile money providers such as M-PESA are enabling a variety of new m-commerce apps and services by incorporating smartphone APIs into their products. (Khamonyi, 2022) report that in a research conducted in Kisii town, Western Kenya, found that the main factors influencing consumer's behavior and choice were locational convenience, general layout, product selection, and customer service, in that order of significance. In their investigation of supermarkets in Karatina, another rural urban center in Central Kenya, a research found that the primary factors influencing consumers' choice of supermarkets were the store's security, high-quality merchandise, and quick customer service.

Therefore, Kenya is a strong leader in digitization, with 86% of its population able to utilize the website and 56% accessing it using a mobile device. Through Mpesa and other payment platforms, the nation is leading the way in mobile banking. Additionally, it is perceived as a door-way to East Africa for innovative tech-space. For the Nairobi Metropolitan the beta coefficients, with a B value of 0.0524 that was significant at a value of less than 0.05, show

that lifestyle and personal characteristics had a favorable influence on customer choice and behavior (Njigua, 2018).

People who are competent at using the internet have a tendency to place higher levels of trust in digital transactions, which encourages their acceptance. They also prioritize using social media as a main source of influence (Gibson & Trnka, 2020). Access to information is widespread as a result of social media and through it, products and services marketing transcends the geographical bounds. Kulimula (2020) stated that a vast audience with different backgrounds may access an institution's marketing strategy via social media. Due to the decreased effort required to obtain product information, this increases customer purchase intention and that the availability of information lowers the cost of searching for customers in all forms and therefore anticipates high levels of purchase intention behavior (Makudza et al., 2020).

According to Hameed et al. (2023), the moderating function of product type may be different for low-involvement products, where customers are more reliant on habit, brand loyalty, or convenience. Attitudes toward information may have less of an effect on intentions to buy low-complexity goods (Hanaysha, 2022). Because they believe the transaction to be low risk or of little consequence, consumers might not actively seek out or digest comprehensive knowledge. In these circumstances, purchase intention may be significantly influenced by additional variables like price, convenience, or brand familiarity (Jamil et al., 2022).

Major firms like Google, Apple, Samsung, Microsoft, and Amazon have already projected the growth and development of their AI-Conventional Apps (including those in smartphones), such Google Assistant, Apple Siri, Amazon Alexa, and Microsoft Cortana. Additionally, the majority of businesses are attempting to provide their own forms of customer service, turning interactions between customers and AI-Conventional Apps into customer service (Wagner et

al., 2019). Among the fastest-evolving areas of interest for researchers are advancements in technology, ethics, marketing channels, marketing strategies, performance, and the concepts of segmentation, targeting, and positioning, along with their impact on consumer behavior (Vlačić et al., 2021). Therefore, the study aimed at assessing the proximity and route map with regard to consumer's M-shopping behaviour in Kenya's Nairobi Metropolitan Region.

1.1.2 Mobile shopping in Kenya

As a channel for product information, a mobile shopping platform should do everything in its power to enhance the richness and diversity of product information by offering a plethora of up-to-date details about product features and usage considerations. This is because the information displayed is a crucial precondition for platform browsing (Correia et al., 2023). Mobile applications, or simply "apps," are a class of application software designed exclusively to operate on devices such as tablets and smartphones, an increasing number of small and medium-sized enterprises (SMEs) are adopting mobile and cloud computing technologies. Today, mobile apps and cloud computing are not merely trendy terms but essential components of business operations (Kamau et al., 2023). Elevated rates of mobile penetration observed across Kenya have contributed to a rise in the use of mobile marketing. With 47.1 million mobile and internet users in Kenya as of September 2013, the country's mobile phone penetration rate increased to 28% from 36.8 million in September 2012, a 17.5 percent increase (Krell et al., 2021). A growing body of research suggests that a large number of businesses view mobile devices as a crucial medium for a variety of marketing messages, such as location-based promos and television ads that engage consumers. Additionally, the use of mobile devices in marketing communication has been highlighted by the success in leveraging mobile information and communication (Wanjiku, 2023).

Through the protections afforded to consumers in Part VI (A) of the Act, which deals with electronic transactions and cyber security, KICA has carefully provisioned for the growth of online payment systems in Kenya. Consumers may feel safe and secure when making payments online, knowing that they are compliant with legal requirements thanks to the extensive security measures outlined in Part VI (A) Sections. This is demonstrated, for example, by the fact that cross-border trading has been made easier by the ability to pay taxes online. Computer systems have been installed all around the nation by the Kenya Revenue Authority that tracks the tax payments on acquired and transit products. In addition to ensuring money, this facilitates doing business with nearby countries. Chebichiy and Odhiambo (2020) reported that 39% of businesses used e-commerce. 72% of orders are placed and 77% of orders are received via mobile devices. Nevertheless, using mobile technology is not the only way that transactions may occur. The research also shows that Email is how 65% of orders are received and how 68.5% of orders are placed. Orders are placed and received using fixed phones as well. 22% of businesses said they were utilizing cloud computing. A virus assault is a risk that each business utilizing ICT must deal with. A minimum of 29% of the businesses polled reported experiencing a viral assault (Mukemba, 2024).

1.2 Statement of the problem

Customers don't completely embrace online buying despite its apparent benefits. Most of them are either afraid of the online frauds or are skeptical of the vendors. Merely 1% of online shoppers return to the store from which they initially placed an order. An estimated 21 million people in Africa shopped online in 2017, accounting for at least 2% of all consumers worldwide. According to (Molinillo et al., 2020); (Japutra et al., 2021), customers experience has an impact on their loyalty in this way. Dharmesti et al., (2021) sought to understand the online shopping behaviors and purchase intentions amongst millennials. The study revealed that young consumers in Australia and the USA had a positive attitude towards online shopping

that significantly affected their online purchase intentions. The study also revealed that social motive had impacted online purchase intentions for Australian people negatively. The study also noted that young consumers were very familiar with the online shopping process in USA and Australia.

In Tanzania, Hungilo and Setyohadi (2020) studied the factors contributing to acceptance of online shopping. The study established that price value, effort expectancy, and trust significantly had influence on behavioural intention towards online purchase. The study also revealed that adoption of online shopping was poor in developing country. Fifty percent of African internet shoppers are from Nigeria, South Africa, and Kenya (Halim, 2022). On the contrary, numerous researchers have not been able to establish evidence supporting the correlation between trust and behavioral intention (Sarkar et al., 2020). M-Shopping applications have a chance to significantly impact the connection between customers and retailers. Nevertheless, up until now, not many research have examined how customer experience through the M-shopping mobile app affects consumer behavior that is, the consumer's sense of loyalty to the store.

In Kenya, Maina (2021) conducted study at Riara University on impact of digital marketing on consumer purchase behavior among the students. The study noted that digital marketing had a great influence on customers' purchases. There are several internet marketing pages and electronic business platforms in Kenya like the E-commerce platforms are commonly disregarded in Kenya, even though there are several benefits to e-business adoption (Nthullih et al., 2020). Kibet (2019) conducted a study Nairobi County on the residents who had made internet purchases and according to the statistics, 97.2% of respondents in Nairobi County have shopped online, a high adoption rate for online shopping in Kenya compared to other regions

of the nation where this is untrue the study did not give detailed information on the customer online shopping behavior.

While earlier research improved knowledge of consumer m-shopping app experiences and post-adoption behavior, it is limited because it primarily examines individual consumer experience dimensions without taking into account the collective impact of consumer-vendor convenience in terms of location based and proximity distance features on the mobile shopping applications. A more profound, self-fitting and ease to use study, customized to feature the real issues facing the m-shoppers especially residing within Nairobi metropolitan region, in their adoption and their purchase behavior on m-shopping should be carried out. This research envisions filling this gap.

1.3 Purpose of the study

This study aimed at presenting consumer-vendor at convenient locations, removing the location barrier, especially for services requiring consumer presence, and provide route maps to connect consumers with vendors. Consequently, it reduced the accessibility time of goods and services between consumers and vendors. First and foremost, the study aimed to gain a comprehensive understanding of consumer behavior. By examining how proximity to delivery points and route mapping influenced shopping patterns, preferences, and decision-making processes, businesses were able to better understand their customers in the Nairobi Metropolitan Area. Through this study, business would identify the most efficient delivery routes, quick access to goods and services reduced delivery time, and transportation costs, leading to more streamlined operations and significant cost savings.

Increasing market reach was another key goal. By analyzing consumer behavior related to proximity and route mapping, businesses identified underserved areas within the Nairobi metropolitan region. This information helped them expand their market reach and improve service availability in those areas. The study also aimed to personalize marketing strategies.

Insights gained were used to develop location-based promotions and targeted advertisements, making marketing efforts more effective and relevant to consumers.

Improving app features was another significant purpose. By identifying the features of m-shopping applications most valued by consumers, businesses enhanced app design and functionality, making it more user-friendly and efficient. Supporting urban planning was an additional benefit of this study. Data on consumer movement patterns and demand for m-shopping services aided in the development of infrastructure to support e-commerce, benefiting the broader community.

Gaining a competitive advantage was crucial for businesses. Understanding the nuances of consumer behavior in relation to proximity and route mapping helped businesses differentiate themselves in a competitive market by offering superior service. The study also aimed to reduce the environmental impact. By optimizing delivery routes and minimizing unnecessary travel, businesses contributed to sustainability goals, enhancing their brand reputation among environmentally conscious consumers.

Finally, this study serves as a foundation for future research and development. It highlighted areas where further investigation was needed and contributed to the broader body of knowledge on m-shopping behavior.

1.4 Research Objectives

1.4.1 General Objective

To assess proximity and route map with regard to consumers' M-shopping behaviour in Kenya's Nairobi Metropolitan Region.

1.4.2 Specific Objectives

- i. To investigate place convenient modelled in the current m-shopping applications influence to consumer's m-shopping behaviour Nairobi Metropolitan.

- ii. To examine the influence of proximity and route map in the current m-shopping applications to consumer's shopping behaviour in Nairobi Metropolitan.
- iii. To model proximity and route map in an m-shopping application in order to boost convenience construct on consumer's shopping behaviour in Nairobi Metropolitan.

1.5 Research Hypothesis

H₀: There is no relationship between model proximity, route map and consumers' M-shopping behavior.

H₁: There is a relationship between model proximity, route map and consumers' M-shopping behavior.

1.6 Justification of the study

Consumers had the advantage of searching through the application for goods and services within a certain defined radius, which presented them with a variety of vendors to choose from based on their tastes and preferences. This increased consumers' access to a range of options and made such entities accessible anywhere and anytime. The study presented a GPS integration feature for location tracing and tracking, helping consumers identify the items they needed, the locations to get them, and the routes to the vendor locations. Additionally, consumers were able to track any purchased item in real time, making it easier to know the exact time when the courier would arrive. This was more convenient than calling a delivery person every few minutes to check their arrival time.

The study showcased a wide range of services. While many people had recently associated such applications primarily with food delivery, this study demonstrated that the applications offered much more than just food. It diversified the services to include a variety of offerings provided by service providers registered according to the operation's policy.

The research study helped demystify the traditional shopping methods and conventional advertising and corporate communication as the primary sources of brand visibility and

customer communication for small and medium-sized businesses in Kenya. Instead, it provided a solution for SMEs facing budget constraints by introducing mobile handheld communication as a cost-effective and efficient way to operate their businesses.

The study offered valuable insights for struggling SMEs on effective strategies to position their enterprises, ultimately leading to their growth by reducing communication expenses and increasing brand visibility, thus bridging the digital gap. The adoption of advanced mobile applications by SMEs contributed to the growth of the country's economy, leading to an increase in the GDP. The application also preserves customers' favorite item orders. If a consumer placed a specific order from a vendor for the first time, it was saved under favorite items. The next time the consumer logged into the application to order, the app suggested their favorite items first, saving time by avoiding unnecessary scrolling through items, stores, or vendors.

1.7 Importance of the study

The findings of this study provided insights into the extent to which convenience in m-shopping, in terms of proximity and route mapping, influenced the behavior of m-shoppers among residents of the Nairobi metropolitan region. This served as a foundation for future researchers to delve deeper into other fundamental drivers affecting consumer m-shopping behavior. Additionally, the study aimed to model a close and interactive relationship between vendors and customers, fostering a better understanding between them and ultimately improving the entire m-shopping sector in Kenya.

1.8 Limitations of the study

Only M-shoppers in the Nairobi metropolitan area were included in this study. This limitation stems from the fact that carrying out the study in more disadvantaged communities was difficult and impossible. The regulatory environment in Nairobi and Kenya as a whole might also impact m-shopping behavior. Local regulations and policies can significantly

influence how consumers and vendors interact within the m-shopping ecosystem, and these factors may not have been fully accounted for in the study. The accuracy of data collected through self-reported methods is another limitation. Respondents might provide biased or inaccurate information, which can affect the validity of the study's conclusions. Misreporting or misunderstanding survey questions can lead to skewed data. Additionally, cultural factors which play a significant role in consumer behavior, might not have been thoroughly explored. These nuances can greatly affect how consumers perceive and engage with m-shopping platforms. Furthermore, some smartphone users were not purchase online, which disqualifies them from contributing meaningful data on the topic.

While studying online m-shopping behavior in Nairobi, the use of internet-mediated self-administered surveys was suitable; nonetheless, it created potential biases, including selection and response biases. These were reduced by widely disseminating the survey via a number of platforms in order to reach a varied participant base, and by providing incentives to promote participation. Technical problems and answer bias were minimized by guaranteeing anonymity and streamlining the questionnaire design.

1.9 Delimitation's of the study

In order to thoroughly examine m-shopping behavior within this particular geographic context, the study restricted its examination to the Nairobi Metropolitan Region, a significant urban region in Kenya. In order to offer comprehensive insights into differences in m-shopping behavior across various population segments, the research within this region only focused on certain demographic groupings, taking into account factors such as gender, age category, marital status, occupation, and level of education. The study was limited to certain technological infrastructure on mobile shopping applications. This was through highlighting their convenience aspect in terms of consumer-vendor proximity distance and routing features and their impact on consumer's m-shopping behavior. Further, the research established a

precise period for gathering and examining data, identifying current patterns and practices in mobile shopping in the Nairobi Metropolitan Region. While studying online m-shopping behavior in Nairobi, the use of internet-mediated self-administered surveys was suitable; nonetheless, it created potential biases, including selection and response biases. These were reduced by widely disseminating the survey via a number of platforms in order to reach a varied participant base, and by providing incentives to promote participation. Technical problems and answer bias were minimized by guaranteeing anonymity and streamlining the questionnaire design.

1.10 Significance of the study

This study investigated the mobile phone purchase habits of Nairobi Metropolitan residents. In particular, it examines two important variables: the proximity of stores to customers and the maps these customers used to find these stores. Businesses may enhance their offerings to make purchasing for clients more convenient by taking these factors into consideration. This research has contributed to the collective understanding of the impact of mobile technology on consumer behavior, serving as valuable insight for scholars and businesses aiming to enhance retail environments and urban development strategies. This study has the potential to enhance Nairobi metropolitan m-shoppers' experiences and provided guidance for urban development initiatives in other comparable communities around the nation.

1.11 Assumptions of the study

This research assumed that the dataset collected was accurately reflect the circumstances faced by m-shoppers overall and that the data collecting tool was both legitimate and capable of measuring the intended outcome. Furthermore, it made the assumption that the chosen respondents were faithfully capture the ideal scenario when dealing with m-shoppers.

1.12 Operational Definition of Terms

Mobile application Software designed for mobile devices to perform specific tasks, such as playing games, managing calendars, or playing music.

Mobile shopping A service that enables customers to browse or buy products and services through their mobile devices at any time and from anywhere using wireless networks.

M-shopping application Software for mobile devices that supports online shopping.

M-shopper A person who uses a mobile application to shop online

E-Commerce The process of buying and selling goods or services over the internet, including the transfer of money and data to complete transactions.

M-Commerce The execution of transactions involving the transfer of ownership or rights to goods and services through mobile access to computer-mediated networks using an electronic device.

A route map A map displaying the main roads in a specific area or the primary routes used by buses, trains, and other forms of transportation within that area.

Proximity The state of being near or close together; the spatial property of being at a short distance from something.

SMEs Small and medium-sized enterprises in Kenya's Nairobi Metropolitan Region that are independent, non-subsidiary firms with an annual turnover between KES 500,000 and 5 million, and employ between 10 and 49 people.

1.13 Chapter Summary

This chapter provided the background to the study, the problem statement, the purpose, objectives, and significance of the study. The scope, limitations, delimitations, and justification of the study were also provided. The next chapter laid a theoretical basis and discussed relevant literature for the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction.

This chapter reviews the relevant theories and empirical literature that uncovers the foundations of performance evaluation in m-commerce and online shopping and then pinpoints to the research gap. This finally leads us to the discussion of a conceptual framework.

2.2 Theoretical framework

2.2.1 Theory of Acceptance Model (TAM)

The Theory of Acceptance Model (TAM) developed by Davis (1989) is an important framework for explaining and forecasting information on system user adoption. As to King and He (2006), TAM gained significant traction in information systems research as one of the most extensively employed and scientifically verified models. As stated by Davis (1989), the goal of TAM is to provide a carefully considered and theoretically justified explanation of the factors influencing the adoption of new technologies, which can also generally explain user behavior across a broad range of technologies used by end users and user populations (Davis, 1989). This model is frequently used to make assumptions about the variables that influence customers' inclinations to utilize new and innovative technology (Ashokkumar & Nagarajan, 2021). This approach is predicated on the idea that perceived utility and perceived ease of use are the primary variables determining intention to use any technology. The perceived ease of use of a technology is positively correlated with its perceived utility (Davis, 1989). When examining the variables that affect users' adoption of technology, TAM has grown to be a highly popular model (Gartner et al., 2022).

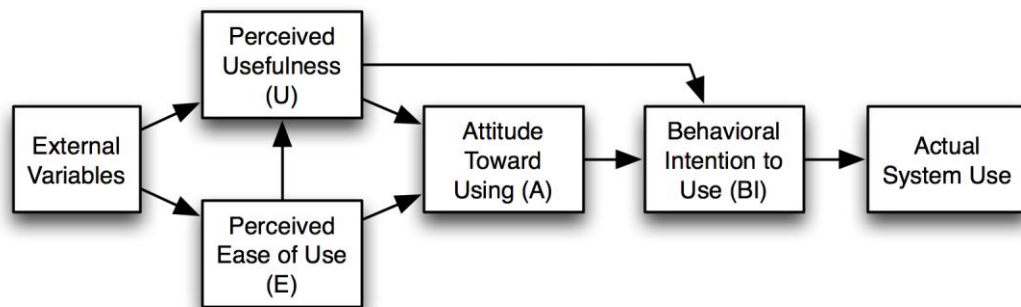
Recent research has revealed several elements based on the original or expanded TAM that influence the adoption of online shopping, the majority of these studies have mostly focused on the experiences of industrialized nations. According to Ashraf et al. (2014), the literature

review highlighted a lack of empirical data on how these characteristics apply to emerging nations, especially in the Balkan region. This gap is also noted by Aldousari et al. (2016) acknowledge this disparity as well, and in their research, they examine Malaysian graduate students' internet purchases. A study conducted in the Balkan area examined Croatian consumers' showed the acceptability of electronic commerce using TAM. The primary benefits of this theory are its ability to identify factors that influence the adoption of information systems and its flexibility for further extension compared to other models. However, its drawbacks include a failure to assess certain barriers that hinder technology adoption. Additionally, its simplicity has led to it being overused, often at the expense of other models. By providing insights into the factors that drive technology adoption, TAM helps researchers develop effective strategies to enhance user acceptance and optimize the design and implementation of technological solutions. TAM emphasizes user perception, specifically PU and PEOU. Understanding these perceptions is critical for designing user-friendly technologies that meet the needs and expectations of users, thereby enhancing user satisfaction and adoption rates.

The key benefit of this theory is that it identifies the aspects that can lead to the acceptance of an information system and allows for extension in comparison to competing models. The downside is that it fails to analyze some of the barriers to technology adoption. Because of its simplicity, it has been over-used at the expense of alternative models. Therefore, TAM model was adopted in this study to understand some factors that influence technology adoption and factors that influence the customer's m-shopping behavior in the Kenyan Nairobi metropolitan (Lestari et al., 2020).

Figure 2.1

Technology Acceptance Model



2.2.2 Theory of Reasoned Action (TRA)

This is a psychological model developed by Martin Fishbein and Icek Ajzen in the late 1960s and early 1970s (Ajzen & Fishbein 1975). It aims to explain the relationship between attitudes and behaviors within human action, specifically focusing on how individuals make decisions about engaging in certain behaviors. According to the TRA model, the normative and attitudinal elements influences the behavioral intention. Studies suggests that the attitudinal component is related to two important constructs: trust and confidence in using a credit card. Trust is a crucial factor in both the success of buyer-seller relationships and e-commerce. The definition of trust in e-business transactions is the customers' conviction and expectation that e-sellers are dependable and will faithfully fulfill their commitments. TRA shows that trust would play a major role in facilitating economic transactions. If customers think online vendors are reputable, trustworthy, and reliable, they will be more inclined to make an online buy (Ashokkumar & Nagaraja, 2021)

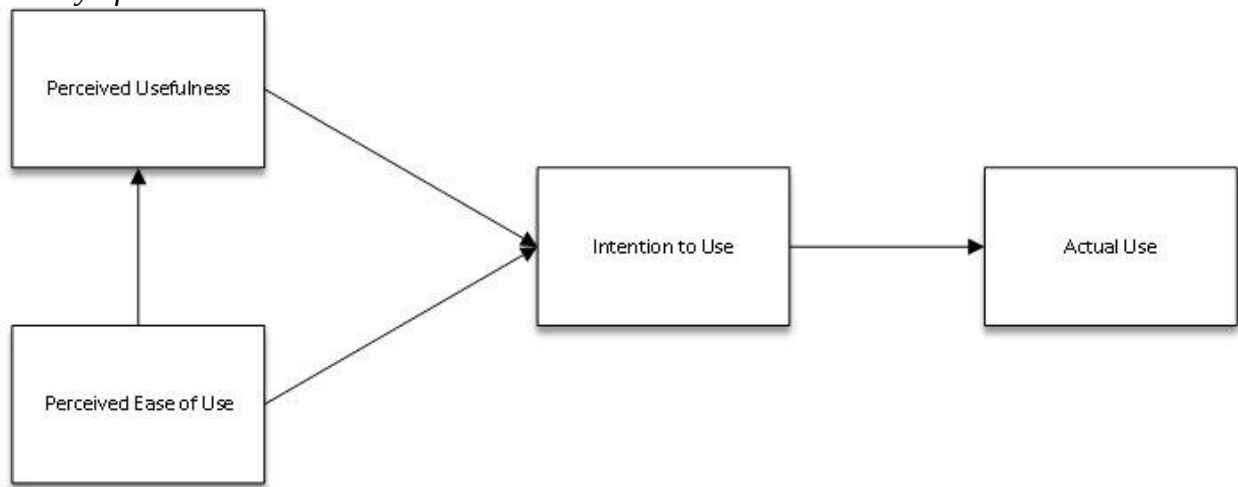
The adoption of TRA, the pragmatic, and the axioms presented by ecommerce firms show that there has been a major shift in customer behavior as a result of the COVID-19 pandemic (Agarwal & Srivastava, 2021). Despite the fact that Saleem et al. (2022) discovered a positive correlation between attitude and buy intention, the research holds that attitude does not indicate

a good attitude toward the intention to shop online. Nonetheless, in accordance with Copeland and Zhao (2020), findings showed that subjective norm strongly influences e-shopping intention and that conducive conditions also promotes e-shopping. Williams (2020) asserts that measuring the variables influencing customers' attitudes about an activity is essential to comprehending the aspects influencing their intentions. The purpose of this study is to determine how customers' attitudes about mobile advertising are influenced by perceived control and location-based mobile advertising services.

According to Kumar et al. (2023), this model is frequently used to elucidate the reasons for web buying by consumers. Online shoppers mention time savings and cost efficiency as benefits of using the technological acceptance model, which is believed to be beneficial. The perceived ease of use of online purchasing systems is a good indicator of their convenience and ease of use, according to the technological acceptance paradigm. The perceived utility and ease of use of a product or service might impact people's positive attitudes and behavioral intent towards online purchasing, leading to their eventual utilization (Kumar et al., 2023). TRA helped the study to understand the factors that inform customer's m-shopping behavior in Kenyan Nairobi metropolitan Region.

Figure 2.2

Theory of Reasoned Action



2.3 Empirical Literature

2.3.0 Customer shopping intentions and behavior

Singh and Basu (2023) investigated consumers' behavior on online shopping where 197 online consumers participated. The findings revealed that, the application of theories remains limited in the current pool of literature that focuses more on developed nations. While studies have primarily considered categories such as apparel and grocery, in terms of methodology experimental and survey-based studies were most common. Otero-López et al. (2021) explain that shopping intention refers to consumers' intentional decisions to spend their money on businesses that align with their values, beliefs, and concerns. This encompasses all aspects of consumer behavior, including the selection, use, and disposal of products and services, as well as their cognitive, emotional, and behavioral responses that emerge at each stage of the process, are collectively referred to as "consumer behavior" (Cuong, 2024). Along with the cognitive and emotional processes that consumers go through, consumer behavior also includes the following behavioral reactions that are shown during the decision-making process for purchases (Dang et al., 2023).

Shahpasandi et al. (2020) proposed the hypothesis that, following a positive emotional experience, customers are more likely to feel favorably about an e-commerce platform, which

in turn affects their attitude toward making purchases. Consequently, it follows that a customer is more likely to fulfill the associated motive when they have favorable feelings about a particular stimulus. The existing body of research, the evolution of cognitive emotion theory, and the association between emotions and action tendency all support this. Because of this, they will continue to feel the impulse to go shopping as well as actively carry out the act of making purchases on e-commerce platforms (Shahpasandi et al., 2020).

The excitement of browsing the streets for merchandise and foodstuffs is enjoyed by many, and the market's scent, particularly in the evening, elevates their spirits. One of the main factors that encourages the purchase of the goods is haggling with merchants. Direct communication builds trust and confidence between businesses and their clients. These crucial components of marketing are lacking when we purchase online (Murugan, 2021).

According to Neger and Uddin (2020), there is a high correlation between consumer variables and time-saving, payment, administrative, psychological, and product considerations. Research also indicates that e-commerce will grow in popularity and draw more customers to online retailers as a result of efforts to comprehend and identify connected concerns.

2.3.1 Place convenience modelled in the current m-shopping applications

McDonald (2020) investigated consumers' M-Shopping similarities and differences. The study utilized qualitative methods to explore participants' mobile shopping experiences on smartphones.

The results highlighted that understanding on how different life stage groups use mobile technology for shopping and their attitudes about these activities is key to the success of retailers. Online shopping is favored for several reasons, including the convenience of making purchases from home, the ability to easily compare prices across multiple vendors to secure the best deal, the preference to avoid the pressure of making decisions in person, and the desire to steer clear of the hassle of driving in heavy traffic, among other factors. In a quantitative study

conducted in Thal University and Sargodha university the statistical examination of the data revealed a statistically significant association between online consumer behavior and factors such as product diversity, ease, privacy, and customer trust (Khan et al., 2023). In addition, most researchers have shown that consumers' online purchasing habits are greatly influenced by shopping convenience (Inthong et al., 2022).

Customer demand for online delivery services has surged as a result of the service industry's ban on in-person service. The COVID-19 pandemic has presented numerous opportunities for both customers and service providers to adopt new technologies and develop innovative online delivery platforms (Jun et al., 2021). In a study conducted in Mexico the findings showed that around 50% of the participants also indicated that they loved shopping and wouldn't want to give it up for the extra convenience of ordering food online. Many people said, without being asked, that they use shopping as a leisure activity that allows them to spend time with their loved ones (Rogus et al., 2020). In another study on the role of online experiences the findings indicate that the dimensions of search and post-possession have the greatest impact on the convenience of online purchasing. On the other hand, future purchase intention is adversely affected in an indirect manner by the convenience of possession (POS), transaction (TRA), and access (ACC) (Saha et al., 2023).

One of the biggest drawbacks of buying items online, according to (Magli et al., 2018), is the lack of in-person interaction with the products. Therefore, the true challenge facing omni-channel retailers is making up for the lack of a point of sale and satisfying customers' need for touch (Silva et al., 2021). To do this, they must permit staff members to communicate with one another and make themselves available for assistance by phone or online (Kalia & Paul, 2021). The findings of a study conducted by Magali et al. (2018) support the favorable influence of ease of access on customer reaction, although at a rather low 9.4% contribution.

A number of elements were determined to be essential for Kenya's adoption of mobile shopping. Perceived utility was one of the variables. The simplicity of use of mobile purchasing has been demonstrated to be a significant factor in Kenyan adoption and numerous participants currently utilize additional apps on their smartphones and feature phones. Online shopping has been expanding quickly in the industrialized world as well (Bachoo, 2019), but developing countries like Kenya have not kept up with the trend. A few of the justifications given for the widespread usage of online shopping are time savings, the ability to quickly compare alternatives, more equitable costs for products purchased online, the ability to access a online market, and user and expert product reviews.

Community convenience stores are classified as home life service entities and have the following traits: a reasonably stable client base, defined shopping goals, and brief customer visits (Jing et al., 2021). Community convenience shops face intense competition in light of the retail industry's fast expansion. Enabling consumers to fulfill their purchase objectives in the lowest amount of time and to improve their overall experience is critical to their existence (Jing et al., 2021). It is not well understood how long-term consumer trust and loyalty are impacted by the lack of in-person connection, nor how online platforms may successfully mimic the leisure and social features of in-person purchasing. To ascertain if the alterations brought about by the pandemic are transient or persistent, longitudinal research is required to assess the long-term effects of COVID-19 on online buying behavior. Furthermore, nothing is known about how technology advancements like augmented reality and artificial intelligence could improve the online buying experience.

However, the steps involved in a full online shopping and e-commerce transaction are as follows: the customer searches for the desired product online, makes a decision and places the order online, the payment stage (which can be completed online or offline), and the products are delivered (Kedah, 2023). Therefore, m-shopping customers' intention or desire to make a

purchase can be sparked by their favorable attitude towards utilizing an online shopping platform, which in turn can be impacted by their experience or beliefs (Gunawan et al., 2019). Furthermore, experience in this example, learning from the past to the present through cognitive, emotional, and conative thinking can promote a favorable attitude toward e-commerce by helping consumers develop patterns or habits (Setyoadi & Rahmawati, 2024).

2.3.2 Proximity and route map in the current m-shopping applications

Gera et al., (2021) did a study on adoption of mobile shopping apps. Eleven qualitative conceptual studies and 73 quantitative empirical studies were identified. Surveys, experiments and secondary data bases were common research approaches among the empirical studies. The study concluded that Mobile apps were conceptualized in terms of values, functions and business models. M-shopping improves the ease of business transactions by enabling the exchange of tangible products and services via an online platform. Businesses in management and marketing as well as customers in all industries. No matter where they are, people may do business and make purchases whenever it is convenient for them (Neger & Uddin, 2020). The widespread use of the Internet has led to the emergence of e-commerce as a crucial aspect of peoples' daily routines. The number of customers who choose to purchase online has significantly increased over the last several years. Consequently, this phenomena has expanded the alternatives available to clients and opened up several chances for m-shopping businesses (Li et al., 2023).

Optimization of delivery routes and the enhancement of service quality has been researched by different scholars. In order to reduce delivery costs and increase the number of food deliveries using the optimal delivery route, Sergio et al. (2020) conducted several optimization tests based on Google maps and used a bio-inspired algorithm (PSO). Based on a two-stage solution technique utilizing Tabu Search (TS) and Genetic Algorithm (GA), Liao et al. (2020) established a multi-objective scheduling model to address the green food delivery routing

problem. In order to provide precise navigation paths based on past GPS trajectories even in situations when road network information is missing, Liu et al. (2020) created a deep inverse reinforcement learning (IRL) system. Order assignment and routing that takes various driver types such as internal, full-time, and part-time drivers into account.

Based on survey data from both surveys conducted by Lu et al. (2022) in China, there is a strong correlation between the daily peak hours of OFD work and food ordering, which fall into two periods: 11:00–14:00 and 17:00–20:00. The delivery distance for each order, which accounts for 70.44 percent of the total delivery distance, and the mean values of daily OFD orders are 30–40 (40.39%) and 2–4 km, respectively. In other words, delivery men work hard to complete the numerous delivery jobs in a short amount of time. In another study by Omar et al. (2021) noted that, as customers begin to use mobile shopping (m-shopping), the number of orders they place annually (order rate) rises. This is particularly true for low-spending customers, who experience an increase in both their order rate and order size as they become more familiar with m-shopping.

Apart from the impact on consumers' expenditure patterns, it was also observed that M-shoppers typically utilize mobile devices for routine product searches that they have previously made. It was suggested that consumers make use of mobile devices since they offer easy access, prompting them to integrate M-shopping into their daily routines. Sarkar et al. (2020) discovered that the degree of price sensitivity among mobile shoppers is influenced by their technological innovation and inclination to use mobile apps for shopping. The more innovative technology is used, and the more likely someone is to use mobile apps, the less sensitive they are to price. According to a study by Mehra et al. (2021), the adoption pattern of mobile apps was found to be significantly influenced by the current life stage of the consumer. However, proximity and route map in the current m-shopping is broadly explained by studies, there are limited studies that have been conducted in Kenya on the same.

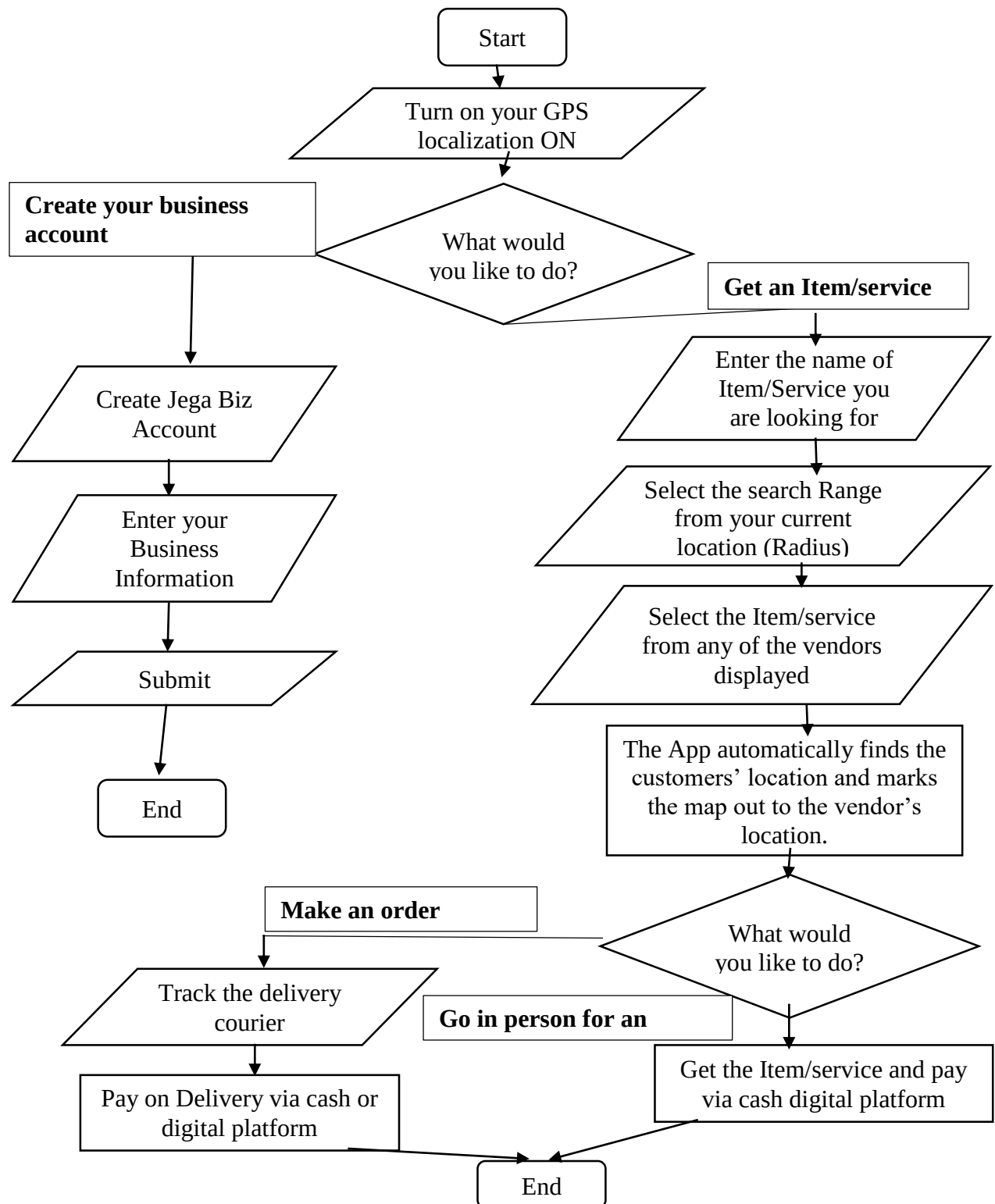
2.4 Research Gap

The existing m-shopping application deployed in Kenyan market are internationally developed by developed countries and in most cases serve the tests of the m-shoppers' behavior in such countries. Kenya being a developing country, the vendor-consumer online shopping taste is overlooked thus making the m-shopping culture lag behind in our country and as a result laxity in adoption of m-shopping by consumers and as well affecting the shopping behavior of the already experienced m-shoppers. In addition, most of the previous work on m-shopping has capitalized on food stuffs' delivery to their consumers and thus have not diversified to meet all the consumers' home need. In addition, it has failed to integrate GPS in the developed applications for convenience factor, so as to ease vendor-consumer connectivity via google map for ease of routing the consumer to the vendor for items which need person's presentation like banks, Barber shops amongst others.

A more profound, self-fitting and ease to use study, customized to feature the real issues facing the m-shoppers especially residing within Nairobi Metropolitan, in their adoption and their purchase behavior on m-shopping should be carried out. It is for the above reasons that this study proposes a system that is meant to resolve such deficiencies. It uses smart phone GPS to locate a registered vendor/service provider and within a selected radius of item search. It is a location based, not just mobile in the sense that it can be carried with the user but it can actually be used on the move. The Figure 2.3 shows M-shopping simulation flow chart and how the above functionalities were achieved to ascertain the proximity and route map constructs of the M-shopping App.

Figure 2.3

Simulation Flow Diagram

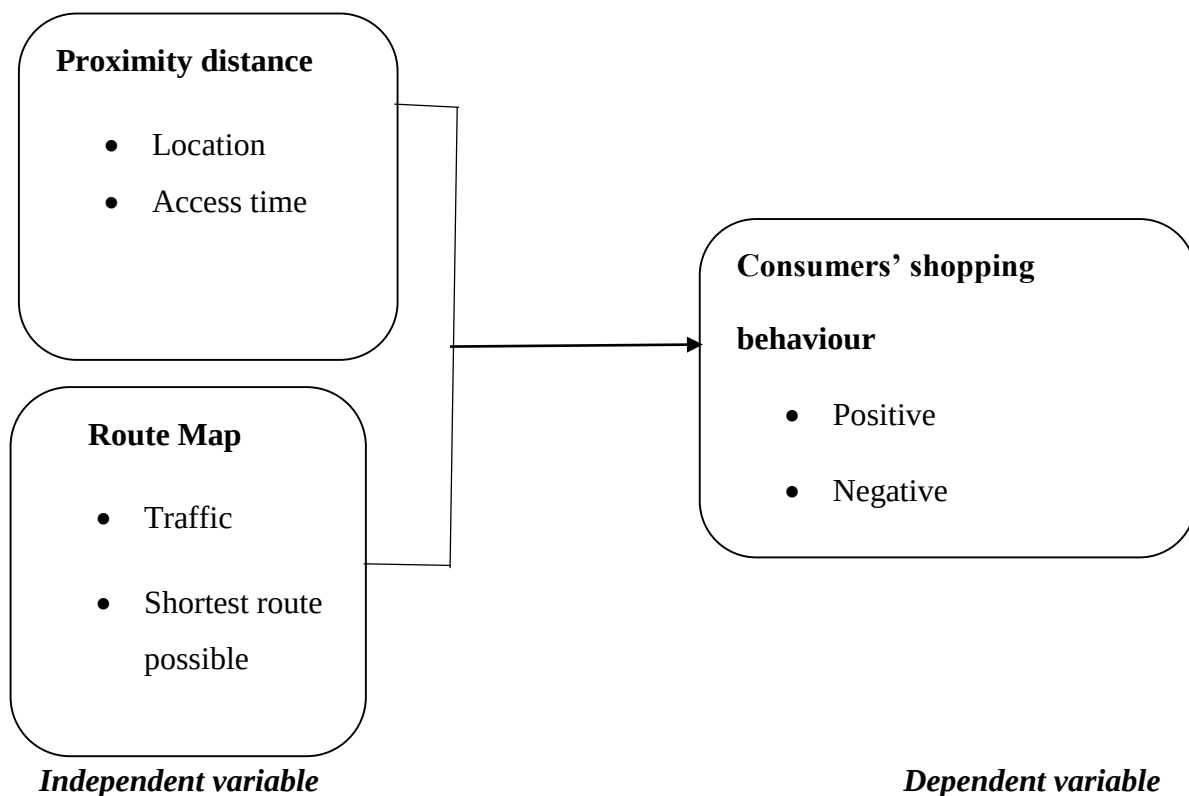


2.5 Conceptual framework

The conceptual framework explains the relationship between the dependent and the independent variables in the study. According to Brown et al., (2022) the conceptual framework outlines the diagrammatic representation of dependent, independent and intervening variables that inform relationships and the outcome of the study. The researcher using the conceptual framework will decide on the research question, objectives and the methodology to be followed to solve the phenomenon under investigation. The independent and dependent variables are linked in the conceptual framework shown in Figure 2.4.

Figure 2.4

Conceptual framework



2.5.1 Discussion

As shown in Figure 2.4, proximity distance and route maps are the independent variables considered to be related with the consumers' shopping behaviour among the M-shoppers. The independent variables directly or indirectly manipulated the dependent variable. Consumers' mobile shopping behaviour is the dependent variable or the outcome caused by the independent variables. Consumers' mobile shopping behaviour can either be positive or negative.

2.6 Chapter Summary

In this chapter, relevant literature was reviewed informed by the study objectives. Reviewed literature explained how place convenience, proximity and route map influenced consumers' M-shopping behaviour resilience. Theory of Acceptance Model (TAM) and Theory of Reasoned Action (TRA) provided the theoretical framework for this study. Finally, a conceptual framework was provided to show the interaction of variables. In the next chapter the methodology was discussed.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter outlines the research design and methodology for the study. It includes a description of the research design, target population, sampling method, data collection, and data analysis techniques.

3.2 Research Design

A cross-sectional research design was carried out through survey that entailed questioning people and recording their responses for analysis at one point in time. A cross-sectional research design is an excellent choice for studies that aim to describe characteristics, identify patterns, and generate hypotheses about a population at a specific point in time. Its efficiency, cost-effectiveness, and ability to provide immediate insights make it a popular choice in various research domains. A survey is desirable where respondents are qualified to provide the desired information. Mugenda and Mugenda (2003) explain that survey research is a method used to gather data from a specific population by requesting input on their beliefs, thoughts, actions, or principles to provide a comprehensive picture of a particular occurrence. Additionally, it seeks to examine the current state of two or more factors at a specific point in time. Cross sectional design was chosen because makes it possible to investigate several variables at once, giving the study a comprehensive grasp of the factors influencing shoppers' choices. Moreover, it is also easier and faster to perform than longitudinal research, which gives the study a great option for analyzing the direct effects of route ease and proximity on M-shopping behavior.

3.3 Target Population

The study population consisted of online m-shoppers residing in the Nairobi Metropolitan area, which includes Nairobi City and its surrounding counties of Kiambu, Machakos, and Kajiado.

3.3.1 Inclusion criteria

- People who have consented to participate in the study.
- Everyone with a smartphone and above 18 years of age and is able to access any mobile shopping application.
- People within Nairobi metropolitan region.

3.3.2 Exclusion criteria

- People under the age of 18 years, without smartphones and do not reside in Nairobi metropolitan Region.

3.4 Sampling procedure

The research utilized convenience sampling to gather primary data via questionnaires. This method involves collecting data from readily available population members, chosen for their easy accessibility. Convenience sampling was selected to meet the necessary sample size within time constraints (Rahman, 2023). Additionally, the researcher employed simple random sampling to select the required number of respondents for the study

3.4.1 Sample size

As there are no statistics available on the population of m-shoppers in Nairobi who use m-shopping apps, the population for this study remains unknown. While convenience sampling does not provide the statistical rigor of probability sampling methods, it can be justified in certain research contexts where the ease of access, resource constraints, and preliminary nature of the study are critical factors. Hence, in determining the sample size, it is necessary to consider the confidence level, standard deviation and margin of error.

In addition, selecting a standard deviation of 0.5 ensures that the sample size is sufficiently large, as advised by Smith (2013). Commonly used confidence levels in research include 90%, 95% and 99% (Smith, 2013). For this particular study, a confidence level of 90% was applied,

with a corresponding Z-score of 1.645. A higher confidence level was chosen in order to obtain the desired sample size of 106 respondents that meets the study's requirements:

$$n = \frac{z^2 x \text{ std} x (1 - \text{std})}{e^2}$$

Where z is the z score

std is the standard deviation

e is the margin of error

$$n = \frac{1.645^2 x 0.5 x (0.5)}{0.08^2} = 106$$

3.5 Instrumentation

The study utilized internet-based self-administered questionnaires for data collection. The chosen questionnaire type allowed for quick data gathering and accurate transfer of the data into excel and STATA version 17 for analysis. The convenience of filling out the questionnaire for respondents and the ease of collecting and analyzing responses led to the selection of this type of questionnaire. Google Forms was used for administering the questionnaire, fitting the research design. This method of data collection was deemed most suitable for overcoming time constraints, as Google Forms offers convenient templates for question setup, unlimited response collection, and easy transfer of responses to an excel document.

Furthermore, this online questionnaire was disseminated via social media platforms, as the study's population comprised all Nairobi metropolitan-based m-shoppers. The link to the survey was shared on several WhatsApp groups in the Nairobi metropolitan area. In order to enhance the response rate, the questionnaires were individually shared using mobile phones or tablets. In addition to asking the respondents if they were m-shoppers, a definition of m-shopping and some examples of popular apps at the time were also given. This made it possible for all survey participants to have the necessary knowledge and to have used these apps.

3.6 Methods of Data Collection

Primary data for this study were gathered online using internet-mediated self-administered questionnaire. However, only those who had used any m-shopping application in the Nairobi Metropolitan Area took part. The survey respondents had to have utilized the technology in order for certain factors, like place convenience (proximity and route map), to be examined.

The questionnaire had different sections section A covered the demographic characteristics of the respondents and the section B contained place convenient modelled in the current m-shopping application, Section C contained information on proximity and route map in the current m-shopping application and section D contained the information on the respondents shopping behavior towards online shopping in Nairobi Metropolitan Region.

3.7 Operational definition of variables

3.7.1 Predictor variables

The demographic characteristics proximity distance was achieved by asking questions around, gender, age category, occupation, marital status, and level of education. The respondents shopping behavior towards online shopping in Nairobi county was achieved by asking their duration of using internet, purpose of using internet, access to online shopping, device used for shopping, amount spend on online shopping, payment method preferred for online shopping, ability to see products before purchase, place they got information on online shopping. On the information on proximity and route map in the current m-shopping application was achieved by responses on distance to an online shop, time preferred for making an online order, duration taken for order to be delivered and reason given when the order delays. Lastly, in terms place convenient modelled in the current m-shopping application was answered by questions around interface friendly, presence of location based features in the m-shopping app, deliver time estimated if provided, check out process, experience with online shopping and recommendation of online shopping application.

3.7.2 Outcome variable

The study outcome which was customer m-shopping behavior was binary variables with positive and negative values and was achieved by combining two variable user friendly interface and recommendation to others. For the positive response was generated when a respondent mentioned the user friendly was neutral and when it was good and they recommended it to people. While for the negative response it was generated when the respondent mentioned the user friendly interface was neutral and when it was bad and they did not recommend to people.

3.8 Pretesting

A research instrument's comprehension of each question by respondents is critically examined as part of the pretesting process. By systematically pretesting a questionnaire and using the feedback to make informed improvements, researchers can significantly enhance the quality and accuracy of their data collection, leading to more reliable and valid results in their study. Through this, the researchers can ensure that the respondents are able to answer the questions without difficulty, which facilitated the seamless collection of the data. 10 M-shoppers in a WhatsApp group designated for the main questionnaire participated in the pretest. The intent was to seek feedback on potential errors to ensure that the respondents would not have challenges while filling in the questionnaire (Wood et al., 2020). The pre-test results indicated which questions required improvement, revision, and alteration. As a result, the researcher was able to restructure the research tool and eliminate unnecessary questions to guarantee the study's simplicity, organization, and flow. To eliminate the potential ambiguity from the respondents, the research ensured a well-designed questionnaire made up of only closed-ended questions was administered.

3.8.1 Validity and Reliability

Validity is the degree to which conclusions drawn from the analysis of data relate to the question being studied. According to Lu et al. (2022), validation seeks to identify biases or pertinent issues in the methodology and any potential effects they would have on the study. The questionnaires validity was attained by use of content validity which was found through consulting and discussing with the supervisors on what to add and adjust to the research instruments. The researcher employed a questionnaire that was developed, discussed and agreed upon with supervisors who have expertise in research to ensure comprehensive coverage of the objectives of this study. The researcher achieved construct validity by accurately operationalizing the key variables of the study. The researcher achieved content validity by addressing all domains in the research objectives in the process of assessing proximity and route map with regard to consumers' M-shopping behaviour in Kenya's Nairobi Metropolitan Region.

On the other hand, reliability refers to the consistency of measurements over time, yielding similar results in repeated trials. Various methods can be used to assess reliability, including parallel forms reliability, internal consistency reliability, and Cronbach's alpha coefficient (Kalkbrenner, 2023). In this study, Cronbach's alpha coefficient was employed to evaluate the reliability of the research instruments, where the 10 questionnaires filled during pretest were used. A reliable instrument should have a Cronbach's alpha coefficient between 0.7 and 1, with values closer to 1 indicating greater internal consistency of the items on the scale. If Cronbach's alpha is greater than 0.7, the study is considered reliable; if it is less than 0.7, it is considered unreliable.

3.9 Methods of data analysis

The researcher collected quantitative data. Descriptive statistics which include mean, standard deviation and percentages was used in the analysis. After the field work, the questionnaires

were checked for completeness, consistency and accuracy then they were arranged to simplify coding and analysis. The data was transcribed and analyzed using STATA to yield statistically inferable information. The results of data analysis were presented in tables. Tables were selected because they had the advantage of containing a great deal of information in small space.

3.9.1 Inferential Statistics

Chi-square Analysis and correlation were used for inferential statistics in order to determine the association between the independent variables and dependent variables. The findings were used to inform the design a mobile application that would cater for proximity distance and route map factors to shape the consumer behavior.

3.10 System design

The system used SDLC (system development life cycle) approach and used agile model. Through module development, each increment would enhance the functionality and capabilities of the model until a full functional system was realized. This allowed additions and modifications to be done at each stage. The researcher opted to use this model because it allowed better testing since testing each individual module was better and easier than testing the entire system like in the waterfall model. The increments in this approach provided feedback to the client that would determine the functionalities of the entire system. This model helped the research focus on process adaptability and end user satisfaction.

Tools required for system development

- i. Android studio - Official IDE for Android development was used to build, test and debug the system
- ii. Vs Code for backend development using Flutter
- iii. Frontend development used HTML, CSS, Javascript and Bootstrap

Figure 5.1

Phases of the Agile model



Source: Sharma et al. (2012)

3.11 Chapter Summary

In this chapter the methodology was discussed providing the research design, study/research area, study population, target population, sample size, sampling technique, data collection instruments, data types, data collection plan, pretesting, data analysis plan, and ethical considerations. The next chapter provided the analysis and interpretation and presentation of the data collected.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter provides the analysis, interpretation, and discussion of the findings from the data collected, guided by the study's objectives and research questions. The study aimed to evaluate proximity and route mapping in relation to consumers' mobile shopping behavior in Nairobi Metropolitan Region, Kenya. Quantitative analysis was used to examine and report the findings. The collected data was analyzed and quantified using STATA, version 17, and the results were presented as percentages in tables and graphs. The analysis was structured according to the study's objectives and organized under major headings: response rate, demographic characteristics, convenience of m-shopping applications, consumer m-shopping behavior, and the relationship between m-shopping application proximity, route mapping, and consumer shopping behavior.

4.1.1 Response Rate

M-shoppers in Nairobi Metropolitan who utilize m-shopping apps served as the study's sample population. The response rate is as shown in Table 4.1.

Table 4.1

Response Rate

Sample Size (n)	Response	Percentage
106	106	100%

From the table 4.1, the response rate for this study was 100% (106). The high response rate can be attributed to the researcher's adherence to appropriate data gathering procedures. The fact that most m-shoppers found the online platform easy for self-administering the questionnaire further contributed to the high response rate. An average response rate of 57% indicates that

the study is relevant, according to Lund (2023). Thus, the response rate obtained was significant for subsequent data analysis process.

4.1.2 Reliability Analysis

According to Kennedy (2022) sufficient reliability is indicated by a Cronbach's alpha value better than 0.7. Therefore, a way to gauge internal consistency is through dependability. The degree of consistency and dependability of the data increases with the coefficient. Cronbach's Alpha was calculated for each objective that constituted a scale in the research. This measure assesses internal reliability and is deemed reliable in social science studies when it is 0.70 or higher. If Cronbach's Alpha falls below 0.70, the consistency is considered insufficient, and the research tool may need to be revised.

Table 4.2

Cronbach's Alpha

Variables	Cronbach's Alpha
Proximity distance	.946
Route Map	.937
Consumers' shopping behaviour	.709

From the analysis Cronbach's Alpha value fell between .709 and .946 which is within the acceptable levels. Therefore, the data collection tool was reliable.

4.2 Socio-Demographic Characteristics

This section examines the demographic details of the M-shoppers who were interviewed. The purpose of this analysis is to gain a deeper understanding of the background of the M-shoppers and their capacity to provide the pertinent data required for this study.

4.2.1. Gender

The researcher wanted to find out the gender statistics of the respondents. This was to make sure that the study was inclusive in terms of gender. The findings are presented in Table 4.2.

Table 4.3

Gender of the Respondents

Gender	Frequency	Percentage
Male	74	69.8
Female	32	30.2
Total	106	100

The result showed that the respondents were comprised of 69.8% (74) females and 30.2% (32) males. This implies that the study was inclusive in terms of gender and each gender was well represented hence no bias. Further, this could imply that most M shoppers in Nairobi are females. This is consistent with the results of Nthullih et al. (2020) which showed that more women than men preferred online shopping.

4.2.2 Age of the Respondents

Age influences perspectives and opinions on various issues. The respondents were asked to specify their ages, which were grouped into four categories: 21-30 years, 31-40 years, 41-50 years, and over 50 years. The distribution of ages among the respondents is presented in Table 4.4 below.

Table 4.4*Age of Respondents*

Age	Frequency	Percentage
21-30 years	20	18.9
31-40 years	66	62.3
41-50 years	12	11.3
Above 50 years	8	7.5
Total	106	100.0

The study revealed that a majority (62.3%) of the respondents who participated in this study were aged between 31 and 40 years. Silva (2021) asserts that the millennials have the largest mobile phone ownership. These findings are reflected in the findings where majority of the respondents with mobile phones were millennials. The age range with the fewest number of respondents was: at 7.5 percent, those above the age of 50 years, and a further 18.9 percent aged 21 to 30 years. Additionally, 11.3 per cent of the respondents were between 41-50 years. The results show that all age categories were fairly well represented. Thus, the findings generated by this study are free of age bias. The age distribution of the responses suggests that young people made up the bulk of those who participated in online transactions, with the majority falling between the 18 to 40 age range (Olasanmi, 2019).

4.2.3 Marital Status of the Respondents

The study sought to establish the marital status of the M-shoppers. The data was analyzed and is as shown in Table 4.4 below.

Table 4.5*Marital Status*

Marital Status	Frequency	Percentage
Divorced	8	7.5
Married	68	64.2
Single	17	16.0
Widowed	13	12.3
Total	106	100.0

The study revealed that a majority (64.2%) of the M shoppers who participated in this study were married, 16% were singles and 12.3% were widowed. Further, 7.5% were noted to have divorced from their spouses. This implies that most of online shoppers are the family men and women. Families prefer online shopping so that they can be able to balance the many responsibilities they have (Goutam, 2020).

4.2.4 Respondents Level of Education

An individual's level of education is closely linked to their problem-solving skills and approach to challenges. Therefore, the study asked respondents to specify their highest level of education. The results are analyzed in Table 4.6.

Table 4.6*Level of education*

Education level	Frequency	Percentage
No Certified Schooling	2	1.9
Primary School Certificate	3	2.8
High School Certificate	4	3.8
Diploma	14	13.2
Undergraduate	66	62.3
Post Graduate	17	16.0
Total	106	100.0

Most of the M shoppers who participated in this study had either a diploma, undergraduate degree or post graduate (91.5%). This implied that education is a key factor when comes to online shopping. M shopper with high level of education is able to navigate through the websites and apps while doing the shopping. The respondents' high level of education contributed to the collection of accurate and high-quality data for the study. McDolnald (2020) agree that education determines the level of interactions with technology, especially mobile tech.

4.2.5 Occupation

Additionally, the respondents were asked to specify their employment status. From the result 64.2% were on a full time employment and 14.2% were on part-time employment. Table 4.7 shows the results.

Table 4.7*Occupation*

Occupation	Frequency	Percentage Frequency
Full-time Employment	68	64.2
Part-time Employment	15	14.2
Self-Employed	14	13.2
Student	4	3.8
Unemployed	5	4.7
Total	106	100.0

Occupation data of the study participants reveals that more than half of the population, 64.2%, are engaged in full-time employment. Part-time employment and self-employment each account for 14.2% and 13.2% respectively, while students also constitute 3.8%. Further, a number of individuals were unemployed representing 4.7%. Since most M-shoppers interviewed were on full time employment may imply the reason for online shopping since there is no time for physical shopping. Full-time employees often lead busy lives, which might increase the likelihood of engaging in mobile shopping due to its convenience (Omar et al., 2021).

4.3 Consumer's M-Shopping Behaviour

The study sought to understand the consumer's m-shopping behaviour in Nairobi Metropolitan. To understand the behaviour, the study examined the methods M-shoppers use to access goods or services, time of order placement and payment methods. The study also looked at how user friendly is the application interface and M-shoppers experience with m-shopping application. The findings show that most 64.2% (68) M-shoppers prefer visiting the shop to access goods or services while 35.8% (38) of the m-shoppers arrange on delivery to access goods and

services. Further, analysis was done to examine M-shoppers' time of order placement. Table 4.8 summarizes the results.

Table 4.8

M-shopping Time

M-shopping Time	Frequency	Percentage Frequency
Afternoon hours	7	6.6
Anytime of the day	63	59.4
Evening hours	26	24.5
Morning hours	10	9.4
Total	106	100.0

Table 4.8 reveals that majority of M-shoppers have no specific time during the day when they place their online order as shown by 59.4%. Further, 24.5% of the M-shoppers prefers evening hours, 9.4% of M shoppers prefer morning hours while 6.6% prefer afternoon hours to place their online order.

Most 66% (70) M-shoppers use mobile money such as Mpesa to pay for their m-shopping goods and service, 22.6% (24) of M-shoppers prefer Cash on Delivery (COD) method of payment and 6.6% (7) use third party such as PayPal. A small percentage (4.7%) of M-shoppers use Debit and credit Cards to pay for their m-shopping goods and services. The summary analysis is shown in Table 4.9 below.

Table 4.9*Payment Method*

Time Payment Method	Frequency	Percentage Frequency
Cash on Delivery (COD)	24	22.6
Debit/Credit Card	5	4.7
Mobile Money (M-Pesa e.t.c)	70	66.0
Third Party (Paypal, Pesapal)	7	6.6
Total	106	100.0

The findings also show that most M-shoppers, did not find the interface of the m-shopping applications friendly nor unfriendly as shown by 67% (71). Only 12.3% (13) of the M shoppers said that the m-shopping applications interface were friendly with 20.8% (22) saying it was unfriendly. Similarly, most 64.2% (68) of the M-shoppers said that their experience with m-shopping application was neither good nor bad. 26.4% said that their experience with m-shopping application was good while 9.4% of the M-shoppers said that their experience with m-shopping application was bad.

4.4 Influence of M-Shopping Application Convenience on Consumer's M-Shopping

To establish the convenience of m-shopping applications to assess the impact on consumers' m-shopping behavior, respondents were asked to specify whether their m-shopping applications included the features listed in Table 4.10.

Table 4.10*M-Shopping Application Convenience*

Statements	Responses	
	Yes	No
M-shopping application give route-map features to the users	20.80%	79.20%
M-shopping application give vendor-consumer distance estimates to the users	23.60%	76.40%
M-shopping application has vendor's contacts	19.80%	80.20%
M-shopping application provides delivery/access time estimates based on the user's location	17.90%	82.10%
M-shopping application has location-based features that help in finding nearby vendors	17.00%	83.00%

Findings shows that most of the m-shopping applications did not have the essential features that would make M-shopping convenient. For instance, it is only 20.80% of the respondents who reported that M-shopping applications gave route-map features. Further, majority of the respondents reported that most M-shopping applications did not have vendor-consumer distance estimates, vendor's contacts and delivery time estimates as shown by 76.40%, 80.20% and 82.10% respectively. Findings also indicated that only 17% of the respondents who reported that M-shopping applications had location-based features that help in finding nearby vendors.

Further, Pearson Chi-Square was conducted to establish whether there existed any association between m-shopping application convenient and consumer's m-shopping behaviour. Results are shown in the Table 4.11 below.

Table 4.11**Convenience Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6.370 ^a	2	.041
Likelihood Ratio	5.198	2	.034
N of Valid Cases	106		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 1.98.

The chi-square results in Table 4.11 indicated that there is a statistically significant association between the place convenient modelled in the current m-shopping applications and consumer's m-shopping behaviour ($\chi^2=6.370$ ^a, $p=.041<0.05$). This finding has an implication that a change in the level of m-shopping applications convenient affect consumer's shopping behaviour in Nairobi Metropolitan. Table 4.12 further, indicated a significant positive correlation between convenient modelled in the current m-shopping applications and consumer's m-shopping behaviour $r(106) = 0.547$, $p=.003<0.05$. Positive correlation implies that a positive change in the level of m-shopping applications convenient will result to a positive change in the consumer's shopping behaviour in Nairobi Metropolitan.

Table 4.12*Convenience Correlations*

		M-shopping applications convenient	Consumer's shopping behaviour
M-shopping applications convenient	Pearson Correlation	1	.547
	Sig. (2-tailed)		.003
	N	106	106
Consumer's shopping behaviour	Pearson Correlation	.547	1
	Sig. (2-tailed)	.003	
	N	106	106

4.5 Influence of M-Shopping Applications Proximity and Route Map on Consumer's

The study sought to establish how m-shopping application proximity influenced consumers' shopping behaviour. Respondents were requested to indicate the estimate distance to the nearest m-shopping shop. Table 4.13 below shows the result.

Table 4.11*Distance to Shop*

Distance to Shop	Frequency	Percentage Frequency
Less than 5Kms	20	18.9
6-15 Kms	13	12.3
16 -29 Kms	18	17.0
More than 30 Kms	14	13.2
Don't Know	41	38.7
Total	106	100.0

Results indicates that most (38.7%) M-shoppers did not know how far was the M-shop from their resident with 13.2% indicating that the shops were over 30 kilometres away. On average, 18.9% of the respondents reported that the M-shops were within 5 kilometres radius, 12.3% reported 6 to 15 kilometres while 17% of the respondents said that the shops were in between 16 and 29 kilometres. These findings align with those in a study by Neger and Uddin (2020) that consumers prefer making purchases where it is convenient for them. Further, the respondents were asked to indicate the time it takes to receive an order from M-shopping and Table 4.14 outlines the results.

Table 4.12*Time to Receive Order*

Distance to Shop	Frequency	Percentage Frequency
In a day	14	13.2
in 2 - 4 days	70	66.0
in 5 - 7 days	15	14.2
More than a Week	7	6.6
Total	106	100.0

From the findings above, most (66%) M-shoppers said that they had always received m-shopping order in 2 to 4 days, 14.2% receive their m-shopping order between 5 to 7 days and 13.2% of the M-shoppers takes less than a day to receive their order. Some orders take long to be delivered, with 6.6% of the M-shoppers indicated that it took more than a week to receive the order. For the case of orders that delayed, most M-shopper did not know the reasons for the delay with some mentioning incorrect addresses, import delays, traffic and unknown locations as major reasons for m-shopping order delay. Koskinen (2021) agree that there are several factors that may cause delay of orders done through m-shopping. These include traffic, weather anomalies, global emergencies, supply chain disruptions and many more.

Pearson Chi-Square was conducted to establish whether there existed any relationship between m-shopping application proximity and consumer's m-shopping behaviour. Results are shown in the Table 4.14 below.

Table 4.13*Proximity Chi-Square Tests*

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	13.234 ^a	8	.001
Likelihood Ratio	15.251	8	.034
N of Valid Cases	106		

a. 8 cells (53.3%) have expected count less than 5. The minimum expected count is 1.23.

The chi-square findings indicated that there is a statistically significant relationship between the proximity in the current m-shopping applications and consumer's m-shopping behaviour ($\chi^2=13.234$ ^a, $p=.001<0.05$). This finding implies that distance to M-shops and time taken by vendors to deliver goods and services determines the consumer's shopping behaviour in Nairobi Metropolitan. M-shoppers, tend to shop more to the m-shopping closer to them and where delivery is done in a short time compared to long distances and where the order takes long time to be delivered. Therefore, the study rejects the null hypothesis and concludes that there is a relationship between model proximity and consumers' M-shopping behavior. M-shoppers, or mobile shoppers, typically prioritize convenience and speed in their shopping experience. They tend to favor retailers that can offer fast delivery times and are located closer to their geographical area.

The study also sought to examine the influence of route map in the current m-shopping applications to consumer's shopping behaviour in Nairobi Metropolitan. The results are analysed in Table 4.16 below.

Table 4.14*M-Shopping Application Route Map*

Statements	Responses	
	Yes	No
Does the application display in real-time the possible routes for the user in times of physical access/delivery?	14.2%	85.8%
Does the application display in real-time the traffic on the possible routes	17.0%	83.0%
Does the application suggest the shortest route possible to the access/delivery of goods/services?	14.2%	85.8%
Can users easily route in real-time to the location of their delivery/pickup/access points within the m-shopping	17.0%	83.0%

Table. 4.16 show that only 14.2% of the M-shoppers reported that m-shopping application displayed in real-time the possible routes for the user in times of physical delivery. Most M-shoppers also said that the applications did not display in real-time the traffic on the possible routes and most applications did not suggest the shortest route possible to the access the goods and services as shown by 83% and 85.8% respectively. Majority (83%) of the M shoppers also said that users cannot easily route in real-time to the location of their delivery/pickup/access points within the m-shopping. Pick-ups and delivery problems come from not having specific time stamps in the applications, affecting the overall operation (Cherkesly & Gschwind, 2022). To establish the relationship between the route map in the current m-shopping applications and consumer's shopping behaviour, a chi square analysis was carried out and results are shown in the Table 4.17 below.

Table 4.15*Route Map Chi-Square Tests*

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	72.192 ^a	2	.000
Likelihood Ratio	60.155	2	.000
Linear-by-Linear Association	13.291	1	.000
N of Valid Cases	106		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 1.42.

Results from the chi-square analysis show that there is a statistically significant relationship between the route map in the current m-shopping applications and consumer's m-shopping behaviour ($\chi^2=72.192^a$, $p=.000<0.05$). This finding implies that m-shopping application with advanced route map technology such like application displaying in real-time the traffic on the possible routes influences the consumer's shopping behaviour in Nairobi Metropolitan. In conclusion, the study rejects the null hypothesis and conclude that there is a relationship between route maps and consumers' M-shopping behavior. The findings aligns with findings by Cherkesly and Gschwind (2022) that having real-time on varied routes gives better consumer experience.

4.6 Discussion of the Findings

The findings revealed that 64.2% of M-shoppers prefer visiting the M-shop to access and interaction with the products. This compliments Magali et al., (2018), who established that one of the biggest drawbacks of buying items online was the lack of in-person interaction with the products. The study also noted that 59.4% M-shoppers had no specific time during the day

when they place their online order. This finding is in line with Kumar et al. (2023), who noted that online shoppers had a benefit of placing the order anytime in the day and at their convenient. However, the finding is contrary to that of Lu et al. (2022) a strong correlation between the daily peak hours of OFD work and food ordering, which fall into two periods: 11:00–14:00 and 17:00–20:00. Kedah (2023) noted that once a customer had made a decision and placed the order online, the payment stage could be completed online or offline before the products are delivered. In conjunction, this study established that most (66%) M-shoppers in Nairobi Metropolitan used mobile money to pay for their m-shopping goods and service while 22.6% (24) of M-shoppers prefer Cash on Delivery (COD) method of payment. Only a few online customers were noted to use third party such as PayPal and Debit and credit Cards to pay for their m-shopping goods and services.

Finding revealed that only 26.4% of M-shoppers had good experience with m-shopping application with majority of the M shoppers 64.2% having fair experience with m-shopping application and 9.4% of the M-shoppers had a bad experience with m-shopping application. This finding is in line with Wang et al., (2019) findings who noted that one of the disadvantages of shopping online was that consumers would lose trust if a website or the application is unfriendly and lacks security and privacy, which slow down the expansion of online shopping. In this study only 12.3% of the M shoppers found the m-shopping applications interface friendly.

The study established a statistically significant relationship between the convenient in m-shopping applications and consumer's m-shopping behaviour ($\chi^2=6.370a$, $p=.041<0.05$). This finding concur to that of Inthong et al., (2022) who revealed that consumers' online purchasing habits are greatly influenced by shopping convenience. In addition, Khan et al., (2023) revealed a statistically significant association between online consumer behavior and factors such as product diversity, ease, privacy, and customer trust. However, findings shown that most of the

m-shopping applications did not have the essential features that would make M-shopping convenient. For instance, it is only 20.80% of the respondents who reported that M-shopping applications gave route-map features. Majority of the respondents reported that most M-shopping applications did not have vendor-consumer distance estimates, vendor's contacts and delivery time estimates as shown by 76.40%, 80.20% and 82.10% respectively. Findings also indicated that only 17% of the respondents who reported that M-shopping applications had location-based features that help in finding nearby vendors. Sarkar et al. (2020) discovered that the degree of price sensitivity among mobile shoppers is influenced by their technological innovation and inclination to use mobile apps for shopping. The more innovative technology is used, and the more likely someone is to use mobile apps, the less sensitive they are to price. Further, the study established a statistically significant relationship between the proximity in the current m-shopping applications and consumer's m-shopping behaviour ($\chi^2=13.234a$, $p=.001<0.05$). Distance and time taken by vendors to deliver goods and services determines the consumer's shopping behaviour in Nairobi Metropolitan. M-shoppers, tend to shop more to the m-shopping closer to them and where delivery is done in a short time compared to long distances and where the order takes long time to be delivered. Primary data for this study were gathered online using internet-mediated self-administered questionnaire. This finding concur to that of Venkatesh et al., (2022) who found out that time taken to deliver goods and services affects the shopping behavior of a customer. The study also established that most (38.7%) M-shoppers did not know how far was the M-shop from their resident with 13.2% indicating that the shops were over 30 kilometres away while 48.2% of the respondents reported that the M-shops were within 30 kilometres radius. M-shoppers (66%) in Nairobi Metropolitan received m-shopping order in 2 to 4 days and 13.2% of the M-shoppers takes less than a day to receive their order. However, some orders take long to be delivered. For the case of orders that delayed, most M-shopper are not given the reasons for the delay with some mentioning incorrect

addresses, import delays, traffic and unknown locations as major reasons for m-shopping order delay.

Liao et al. (2020) established a multi-objective scheduling model to address the green food delivery routing problem. In order to provide precise navigation paths based on past GPS trajectories even in situations when road network information is missing, Liu et al. (2020) created a deep inverse reinforcement learning (IRL) system. Order assignment and routing that takes various driver types such as internal, full-time, and part-time drivers into account. The delivery route method and routing optimization model were examined by Li et al. (2019) and established that a customers with the route maps would shop more compare compared to those lacked the route maps. This study established a positive statistically significant relationship between the route map in the current m-shopping applications and consumer's m-shopping behaviour ($\chi^2=72.192^a$, $p=.000<0.05$) which implies that m-shopping application with advanced route map technology such like application displaying in real-time the traffic on the possible routes influences the consumer's shopping behaviour in Nairobi Metropolitan. Further, the study established that only 14.2% of the M-shoppers reported that m-shopping application displayed in real-time the possible routes for the user in times of physical delivery. Most M-shoppers also said that the applications did not display in real-time the traffic on the possible routes and most application did not suggest the shortest route possible to the access the goods and services as shown by 83% and 85.8% respectively. Majority (83%) of the M shoppers also said that users cannot easily route in real-time to the location of their delivery/pickup/access points within the m-shopping.

4.7 Hypotheses

The study found that there is a positive relationship between model proximity, route map and customer m-shopping behavior. Therefore, we reject the null hypothesis of no deference and

conclude that there is a significant relationship between the independent variables model proximity, route map and the outcome customer m-shopping behavior.

4.8 Modelled proximity and route map in an m-shopping application

The study led to the development of an application called Haraka Haraka (<https://play.google.com/store/apps/details?id=com.beyondthehorizon.harakaharaka>), which is available for download on the Google Play Store. To use the app, vendors must create an account for their business. Haraka Haraka offers several significant advantages but also comes with some notable disadvantages.

One of the primary advantages of Haraka Haraka is its ability to access the user's location through GPS. The app provides a comprehensive list of services available within the user's vicinity, covering a range from 100 meters to 30 kilometers. This feature simplifies the process of finding nearby services, saving users time and effort by providing quick access to local options. However, the app also has some disadvantages. One major issue is related to service relocation. Once a service is registered at a specific location within the app, it is tied to that location. If a vendor moves to a new location, the app updates to reflect this new address. Additionally, while the app shows available services, users still need to physically travel to these service locations to be served. The app does not facilitate remote services or delivery options, which can be a limitation for users seeking convenience or those who cannot travel easily.

4.8.1 Model proximity and route map in an m-shopping application

Figure 4.1

Google play store download

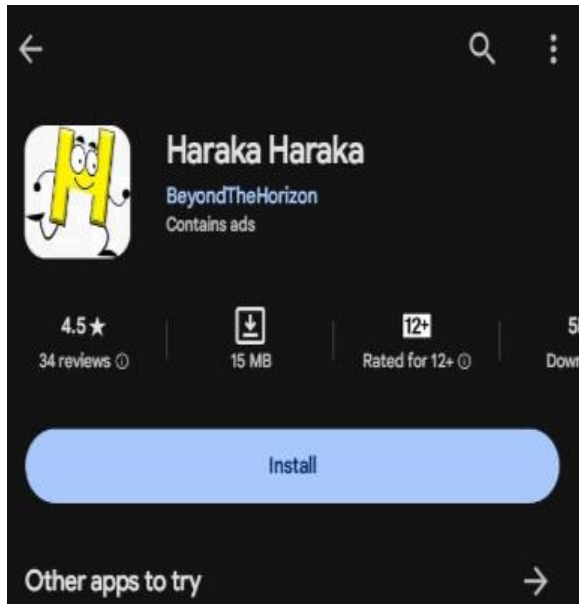


Figure 4.2

Settings for GPS

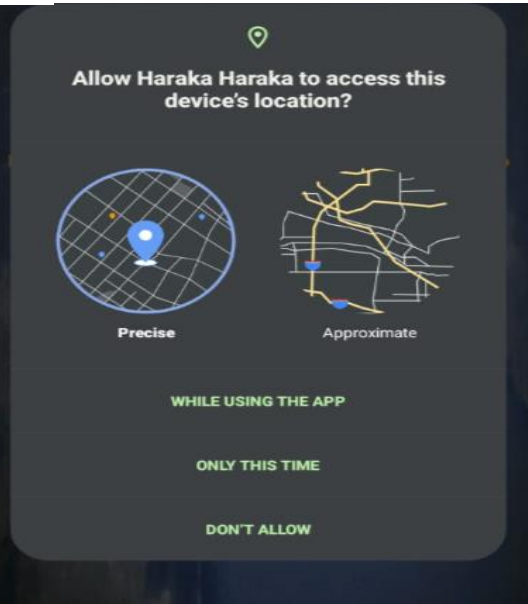


Figure 4.3

Create an Account for your Business

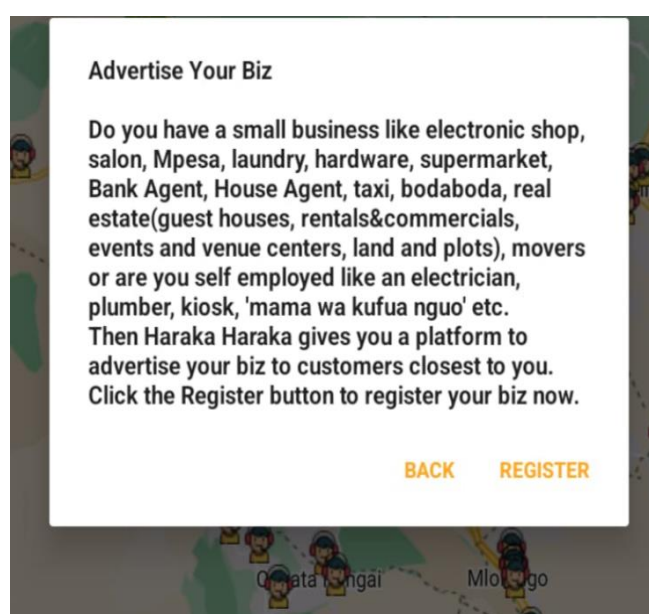


Figure 4.4
Select the radius of your search from your location

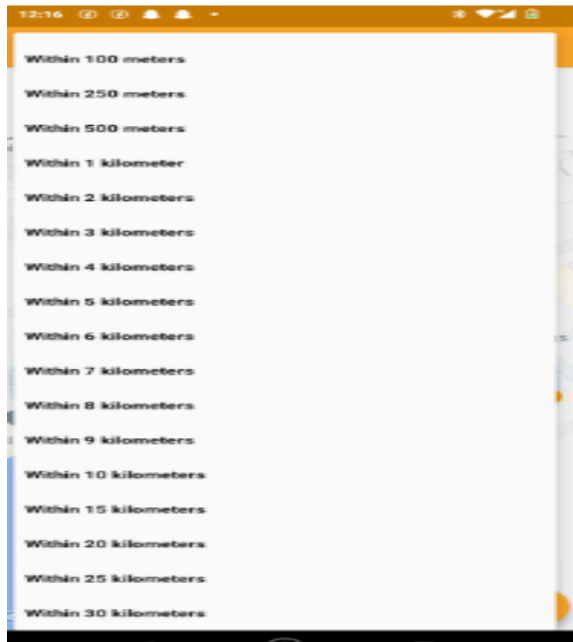


Figure 4.5
Available carwash points within your search radius

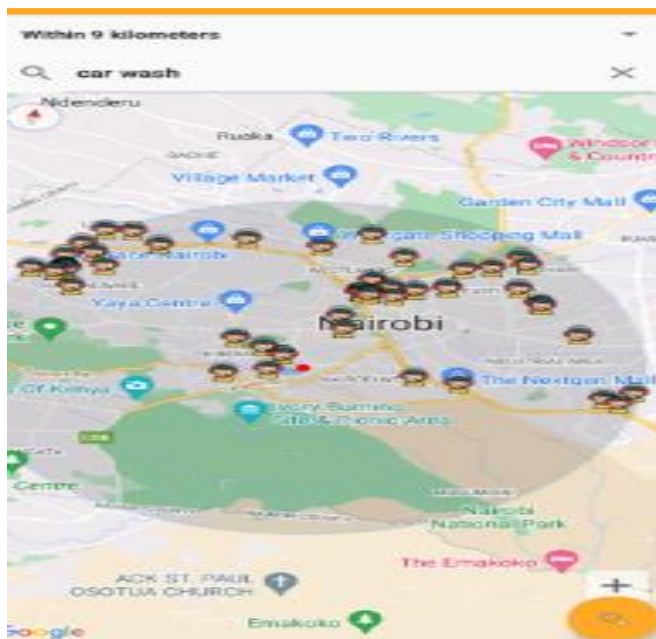


Figure 6.6
Route map using the app



CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATION

5.1 Introduction

This chapter provides a summary of the key findings of the study, the conclusions drawn from these findings, and the recommendations made by the researcher. The conclusions and recommendations are aimed at addressing the primary objective of the study. Additionally, this chapter outlines proposed areas for future research.

5.2 Summary

This study sought to assess proximity and route map with regard to consumers' M-shopping behaviour in Kenya's Nairobi Metropolitan Region. The study specifically aimed at investigating the place of convenient modelled in the current m-shopping applications influence to consumer's m-shopping behaviour Nairobi Metropolitan; examine the influence of proximity and route map in the current m-shopping applications to consumer's shopping behaviour in Nairobi Metropolitan and model proximity and route map in an m-shopping application in order to boost convenience construct on consumer's shopping behaviour in Nairobi Metropolitan. A cross-sectional research design was adopted and a sample size of 106 respondents determined using a simple random sampling technique. The primary data was collected through structured survey questionnaires, after which, STATA software was used for its analysis.

The study established that M-shoppers prefer visiting the M-shop to access and interact with the products and most M-shoppers have no specific time during the day when they place their online order. M-shoppers in Nairobi Metropolitan mostly prefer use of mobile money to pay for their m-shopping goods and service while a few use Cash on Delivery (COD) method of

payment. A negligible use third party such as PayPal and Debit and credit Cards to pay for their m-shopping goods and services. Most M-shoppers in Nairobi Metropolitan have bad experience with m-shopping application with majority terming m-shopping application interface unfriendly.

A statistically significant relationship exists between the convenient in m-shopping applications and consumer's m-shopping behaviour. Despite this truth, the study established that most of the m-shopping applications did not have the essential features that would make M-shopping convenient. For instance, most m-shopping applications did not give route-map features, vendor-consumer distance estimates, vendor's contacts, delivery time estimates and location-based features.

Further, the study established a statistically significant relationship between the proximity in the m-shopping applications and consumer's m-shopping behaviour. Implying that distance and time taken by vendors to deliver goods and services determines the consumer's shopping behaviour in Nairobi Metropolitan. M-shoppers, tend to shop more to the m-shopping closer to them and where delivery is done in a short time compared to long distances and where the order takes long time to be delivered. However, it is unfortunate that most m-shoppers did not know how far the M-shop was from their residence as it was not provided in the application. It takes 2 to 4 days for most M-shoppers in Nairobi Metropolitan to receive their goods and services. Some order delays are always experienced and this study established that most M-shopper were not given the reasons for the delay in case it happens with some mentioning incorrect addresses, import delays, traffic and unknown locations as major reasons for m-shopping order delay.

Finally, a positive statistically significant relationship between the route map in the current m-shopping applications and consumer's m-shopping behaviour was established implying that m-shopping application with advanced route map technology such like application displaying in real-time the traffic on the possible routes influences the consumer's shopping behaviour in

Nairobi Metropolitan. However, m-shoppers reported that most m-shopping application did not display in real-time the possible routes for the user in times of physical delivery, real-time the traffic on the possible routes and the shortest route possible to access the goods and services.

5.3 Conclusions

The results of this study indicate that a user-friendly application interface, the proximity distance to the goods and services, the location and routing features on mobile shopping application, the access time to the good and services, a fluid online shopping experience, and other factors all have a substantial influence on customers' mobile shopping behavior. In order to ensure the growth and longevity of business, online retailers are thus encouraged to concentrate on those factors that have a favorable correlation with their consumers' mobile shopping behavior.

The findings demonstrate that consumers' mobile shopping behavior is influenced by the M-shopping application convenience. Shopping ought to endeavor to preserve and augment the perceived utility and ease that customers associate with their platforms, all the while allocating sufficient resources and assistance to the most consequential factors previously mentioned. For existing customers to keep using m-shopping, shoppers must therefore enhance the aspects of timing, actual delivery time, prompt response, and search functionality.

5.4 Recommendations on Research Findings

From the findings and analysis, the study recommends the following under each objective:

- i. Findings revealed that most of the m-shopping applications did not have the essential features that would make M-shopping convenient such as route-map features and vendor's contacts. For instance, it is only 20.80% of the respondents who reported that M-shopping applications gave route-map features. Exceptional performance in business requires one to move ahead of their competitors in enhancing customers'

experiences. Therefore, this study recommends mobile business owners to invest in developing mobile APP that takes care of customers' convenient including but not limited to route-map features and vendor's contacts.

- ii. Further, the study established a statistically significant association between the place convenient modelled in the current m-shopping applications and consumer's m-shopping behaviour ($\chi^2=6.370a$, $p=.041<0.05$). Hence, this study recommends APP developers to enhance vendor management by implementing a feature that allows vendors to update their location status and notify their customers about the change in real-time through push notifications or in-app messages can help keep users informed.
- iii. The study also established a significant relationship between the proximity and the customer m-shopping behavior. Hence, this study recommends that mobile business owners and managers should ensure their M-shopping APP has vendor-consumer distance estimates and delivery time estimates to create confidence to customers.
- iv. The study also recommends the APP developers to integrating remote service options or delivery features can minimize the need for users to travel, increasing the app's convenience. Partnering with local delivery services could be a beneficial addition. Additionally, developing a user feedback system within the app can help identify and address pain points related to service relocation and access.
- v. Lastly, providing a comprehensive user guide within the app can help users understand how to utilize all its features effectively, including checking for the latest updates on service locations.

5.4.1 Recommendations for Further Research

The study recommends a more detailed examination of security and privacy concerns. Research should investigate how security and privacy features impact customer trust and their willingness to make online purchases. Additionally, the perceived utility and convenience of

the shopping platform warrant further study. This research should explore how these factors influence customer decisions and long-term engagement. Longitudinal studies can track changes in customer perceptions and behaviors over time, while analyzing feedback and usage patterns can identify the most valued features. Furthermore, user interface design and usability testing are essential. Research should focus on pinpointing specific elements of user interface design that significantly enhance user experience and streamline the purchasing process elements like coming up with GPS that the client can track his/ her delivery as well as provide an appropriate time estimate.

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APPENDICES

APPENDIX 1: DATA COLLECTION RECOMMENDATION LETTER



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Fax: 254-64-30162
Email: deanrd@kemu.ac.ke

DIRECTORATE OF POSTGRADUATE STUDIES

September 3, 2020

Commission Secretary,
National Commission for Science, Technology and Innovations,
P.O. Box 30623-00100,
NAIROBI.

Dear sir/ Madam,

RE: AGBESTERS MWOVE NDOLO (CIS-3-0415-1/2018)

This is to confirm that the above named is a bona fide student of Kenya Methodist University, Department of Computer Science undertaking a Masters in Computer Information Systems . He is conducting research on, 'M-shopping Application's construct: Modelling proximity and route map with regard to consumers M-shopping behavior in Kenya's Nairobi Metropolitan Region'

We confirm that his Research proposal has been defended and approved by the University.

In this regard, we are requesting your office to issue a permit to enable him collect data for his research.

If there is any query kindly write to us on deanrd@kemu.ac.ke

Any assistance accorded to him will be appreciated.

Thank you.

Dr. John Muchiri, Ph.D.
Director Postgraduate Studies

APPENDIX 2: NACOSTI RESEARCH LICENSE

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 636378	Date of Issue: 08/September/2020
RESEARCH LICENSE	
	
This is to Certify that Mr., AGBESTERS MWOVE NDOLO of Kenya Methodist University, has been licensed to conduct research in Nairobi on the topic: M-SHOPPING APPLICATION'S CONSTRUCT: MODELLING PROXIMITY AND ROUTE MAP WITH REGARD TO CONSUMERS' M-SHOPPING BEHAVIOR IN KENYA'S NAIROBI METROPOLITAN REGION for the period ending : 08/September/2021.	
License No: NACOSTI/P/20/6592	
636378	
Applicant Identification Number	Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
	Verification QR Code
	
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APPENDIX 3: COVER LETTER

Agbesters Mwove Ndolo,
Kenya Methodist University,
P.O Box 7380-30100,
Nairobi.

Dear Respondent,

I am a Masters student in the school of computer science at Kenya Methodist University and in my final year of study. As part of the requirements for the award of the degree of Masters of Science in Computer Information Systems, I am undertaking a research on “Using mobile application to model mobile-based online shopper satisfaction behaviour.”. The data gathered in this questionnaire will be handled strictly, confidentiality and solely for the purposes of this thesis unless agreed otherwise with you. The study will be a published as a report, and it can as well be used by mobile application developers in developing online shopping applications for all business sectors based on the information given on the questionnaire by the consumers. The report will be available at Kenya Methodist University Library for use by the public in enhancing knowledge in the field of Mobile Application’s based Online shopping.

In this regard, I am kindly enlisting for your support in terms of time, and by responding to the attached interview protocol. Your accuracy and candid response will be critical in ensuring objective research. However, it will not be necessary to write your name on this questionnaire or interview protocol. Thank you for your answers, time and cooperation.

Yours Faithfully,

Agbesters Ndolo.

APPENDIX 4: QUESTIONNAIRE

SECTION A: DEMOGRAPHICS

1. What is your gender?

- a) Male
- b) Female

2. What is your age bracket?

- a) Below 20 years
- b) 21-30 years
- c) 31-40 years
- d) 41-50 years
- e) Above 50 years

3. What is your marital status?

- a) Married
- b) Divorced
- c) Widowed
- d) Single

4. What is your highest level of education achieved or in the process of attaining it?

- a) No Certified Schooling
- b) Primary School Certificate
- c) High School Certificate
- d) Diploma
- e) Undergraduate
- f) Post Graduate

5. Which of the following describes best your current occupation?

- a) Full-time Employment
- b) Part-time Employment
- c) Self-Employment
- d) Unemployment
- e) Student

SECTION B: PLACE CONVENIENCE MODELED IN THE CURRENT M-SHOPPING APPLICATIONS

6. Does the m-shopping application give route-map features to the users?

- a) Yes
- b) No

7. Does the application give vendor-consumer distance estimates to the users?

- a) Yes
- b) No

8. Are the vendor's contacts available on the applications?

- a) Yes
- b) No

9. What access method to good/services do you prefer?

- a) Visit the vendor/shop
- b) Arrange on Delivery

10. When do you prefer to place your mobile shopping orders online?

- a) Morning hours
- b) Afternoon hours

- c) Evening hours
- d) Anytime of the day

11. How much time does it usually take for you to receive your order?

- a) In a day
- b) In 2 – 4 days
- c) In 5 – 7 days
- d) More than a week

12. In cases of access/delivery delays, what is the possible reason?

- a) Incorrect Address
- b) Import/Export delays
- c) Traffic
- d) Unknown Location
- e) Not Known

13. What payment method do you prefer for online shopping?

- a) Cash on Delivery (COD)
- b) Mobile Money (M-Pesa e.t.c)
- c) Debit/Credit Card
- d) Third Party (Paypal, Pesapal)

14. Is the checkout process seamless in the m-shopping applications especially for orders from nearby stores or for in-store pickups?

- a) Yes
- b) No

SECTION C: PROXIMITY AND ROUTE MAP IN THE CURRENT M-SHOPPING APPLICATIONS

15. Is the vendor/consumer real-time location visible on the applications?

- a) Yes
- b) No

16. Is the vendor/consumer distance estimates given on the application?

- a) Yes
- b) No

17. Are you in a position to select the preferred radius of search for good/services on your applications?

- a) Yes
- b) No

18. Are there delivery/access time estimates provided by the m-shopping application based on the user's location?

- a) Yes
- b) No

19. Are there location-based features in the m-shopping applications that help in finding nearby vendors?

- a) Yes
- b) No

20. Does the application display in real-time the possible routes for the user in times of physical access/delivery?

- a) Yes

b) No

21. Does the application display in real-time the traffic on the possible routes?

a) Yes

b) No

22. Does the application suggest the shortest route possible to access/delivery of goods/services?

a) Yes

b) No

23. Can users easily route in real-time to the location of their delivery/pickup/access points?

a) Yes

b) No

SECTION D: CONSUMER BEHAVIOR TOWARDS M-SHOPPING APPLICATIONS

24. How user-friendly is the interface of the m-shopping applications for navigation different products and categories?

a) Friendly

b) Neutral

c) Unfriendly

25. How is your experience with m-shopping applications?

a) Good

b) Neutral

c) Bad

26. Would you recommend someone to use m-shopping applications?

- a) Yes
- b) No

THE END

Thank you for participating