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The Challenges of access to and use of digital financial services by women in Homa Bay County, Kenya.

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THE CHALLENGES OF ACCESS TO AND USE OF DIGITAL FINANCIAL SERVICES BY WOMEN IN HOMA BAY COUNTY, KENYA

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

Emily Akinyi Omego

25th January 2023

Approval

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ABSTRACT

This study examines the background of Digital Financial Services (DFS) situation for women, specific emphasis on the challenges that inhibit women from efficiently using DFS to enhance finance freedoms in Homa Bay County. Limited access to appropriate financial services is one of the key challenges that prevent economic participation of women. Furthermore, female headed households are more likely than male-headed households to be poor due to limited economic opportunities. Digital financial services contribute to the expansion of financial inclusion of women, but in some countries, it is disproportionate, and even though access to finance for women is rising, the gender gap is still persistent. In Kenya, two-thirds of unbanked adults are women and the most significant barrier to women's financial inclusion being access to and use of their assets to earn independent income (Demirgüç-Kunt et al, 2018.). Anchored on Unified Theory of Acceptance and Use of Technology (UTAUT) and Diffusion of Innovation (DoI) theories, the study highlights the challenges experienced by women and how these reflect on their financial decisions and the fundamental societal norms leading to these challenges. Mobile coverage and online bank usage as the primary representation of DFS usage, with data collected in the year 2023 via a study of selected women respondents in Homa Bay county. The data analysed using descriptive and inferential statistics and the findings were that women in Homa Bay County own digital devices, they had a good understanding of basic use of the digital devices and use digital financial services. Inferential analysis showed that differences in access to and use of DFS by women in the study area was due to variations in their digital financial literacy, with the women with a good comprehension of digital financial literacy being quite comfortable in its use and enjoyed using their devices. Socio-cultural norms did not establish a distinct effect on the nature of DFS services utilization apart from explaining number of daily logins. There were mixed relationships between perceived trust and risk against DFS use with a higher perception of doubt and reservation in the use of digital devices associated with lower logins. Perceived ease of use was associated positively with DFS usage, thus intimating that, women in Homa Bay County had a relatively high level of ease of use of digital financial services.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS AND ACRONYMS

DFS	Digital Financial Services
DOI	Diffusion of Innovation Theory
IMF	International Monetary Fund
CGAP	Consultative Group to Assist the Poor
WB	World Bank
COVID-19	The coronavirus disease 2019
CBK	Central Bank of Kenya
PSPs	Payment Services Providers
NHIF	National Hospital Insurance Fund
MFS	Mobile Financial Services
MFI	Micro Finance Institutions
SACCOS	Savings and Credit Co-Operative Society
ATMs	Automated Teller Machines
POS	Point Of Sale
IFC	International Finance Corporation
ROSCA	Rotating Savings and Credit Association
ASCA	Accumulating Savings and Credit Association
GDP	Gross Domestic Product
SMEs	Small and Medium Enterprises
APR	Annual Percentage Rate
HDI	Human Development Index
OECD	Organisation for Economic Co-operation and Development
CFSAs	Community Financial Services Associations
KNBS	Kenya National Bureau of Statistics
FSD	Financial Sector Deepening
SDGs	Sustainable Development Goals
UTAUT	Unified Theory of Acceptance and Use of Technology
DOI	Diffusion of Innovation Theory
UNCTAD	United Nations Conference on Trade and Development
GPFI	Global Partnership for Financial Inclusion
MHF	McGraw Hill Financial
GSMA	Global System for Mobile Communications Association
ICF	International Coach Federation
UCL	University College London
PIN	Personal Identification Number
TAM	Technology Acceptance Model
FI	Financial Institution
CAGR	Compound Annual Growth Rate
IRB	Institution Review Board

DEFINITION OF TERMS

Digital financial tools	Online banking, Mobile banking, Contactless payments, Smart ATMs
Digital financial models	Online platforms, Apps and tools, Biometrics, Tokens
Digital channels	Internet, Mobile phones, ATMs, POS terminals, Electronic enabled cards, Agent networks, Biometric devices, Tablets, Phablets
Digital access points	Agents and or other third-party intermediaries to improve accessibility and lower the overall service delivery cost
Financial Institutions	Banks, Microfinance institutions
Non-Financial firms	Mobile network operators and third-party providers: agent network managers, payment aggregators

DEDICATION

I dedicate this research work to my family.

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CHAPTER ONE: INTRODUCTION TO THE STUDY

1.1 Introduction

The chapter introduces the research topic envisaging how fostering the usage of digital financial services by women is the link to narrowing the gap in utilization of financial services between men and women. Limited access to appropriate financial services is one of the key challenges that prevent economic participation of women, Furthermore, female headed households are more likely than male-headed households to be poor due to limited economic opportunities while the expansion of digital financial services specifically is seen as the optimal market-based solution in narrowing this gap and a major opportunity to enhance finance freedoms in Homa Bay County. The chapter examines the background of the study, Digital Financial Services definition and tools, Homa Bay county statistics, Problem statement, research objectives, significance of the study and the chapter summary.

1.2 Background of the study

Women inclusion in the usage of financial services is broadly recognized as a key driver of women's participation in the economy and of the household well-being, leading to a robust economic growth, social development, and diversified financial systems (Nomsa, 2015). Esther Boserup's in The Role of Women in Economic Development, published in 1970, drew the attention of the international community to a gender perspective on development policy and the poverty of women in developing countries (Young 2002). The case for fostering the usage of financial services by women as a public policy imperative is now recognized globally, with vocal proponents and attention given to this objective on platforms such as the IMF Managing Director's Global Policy Agenda. The expansion of digital financial services specifically is seen as the optimal market-based solution in narrowing the gap in usage of financial services between men and women and a major opportunity for both women and men by the 2019 Fin Access Household Survey, but this opportunity is far from being fully realized (Chakma, 2014), with calls for further research to obtain an understanding of the consequences of increased digitalization of financial services, ('Seldal, 2022)

Digital financial services (DFS) as defined by The International Monetary Fund (IMF) refers to digital non-cash transactions enabling financial services that include payments, remittances, and credit processing through digital channels. (International Monetary Fund, 2020) These digital channels include primarily online bank and mobile platforms. Digital financial services definition in this study is adopted from CGAP, (2015), as technology which enables previously

excluded customers to be able to access and use digital financial services provided by financial institutions and agents, through transactional platforms using mobile devices. According to Ashraf et al, 2015, these Digital financial services through digital tools can empower women within households to make decisions and gain greater control over resource allocation.

Data analysed over a period of eight years, 2008 – 2016 shows that when women-headed households in Kenya adopted mobile money accounts, poverty dropped, savings rose, and 185,000 women left agricultural jobs for more reliable, higher paying positions in business or retail (Tavneet, 2017). A further study conducted demonstrated that access to mobile money services helped women-headed households in Kenya to reduce extreme poverty and provided opportunities to change livelihoods from farming to other business services (Suri and Jack, 2016). Similarly, Doepke and Tertilt (2011) demonstrated that with improved access to finance, women are more likely than men to spend on education, food, and health care, resulting in improved welfare and productivity of their families. In the Philippines, targeting women by opening of a goal-based commitment account increased savings by 81 percent and resulted in greater bargaining power for women within the household, increased expenditure on female-oriented consumer durables was particularly attractive to less empowered women (Ashraf et al. 2015).

The expected future growth of mobile money can allow around 1.6 billion unbanked people to access financial services for the first time, about half of them being women in developing and emerging economies, and 45 percent coming from the poorest two quintiles of the world income distribution (MGI, 2016a). Women's access to individual private savings bank accounts not only further economic resilience by increasing their savings, but also enable women to make financial choices, buy more durable goods, and increase their bargaining power in the household (Ketterer & Andrade, 2016). The participation of women in entrepreneurship would in consequence empower them economically, create independence in them and give them control over resources (Duflo, 2012). It is also well documented that female-controlled finances are more likely spent on household expenditures, such as food and water, as well as child welfare including school fees and health care (Duflo, 2012).

The society perceives women differently from men and this different perceived status of men elucidates on why there are different role expectations for both men and women in the society they belong. In an economy where the expansion of digital financial services is key to

narrowing the gap in usage of financial services, and these financial services tools being key to empower women within households to make decisions and gain greater control over resource allocation. (Ashraf et al, 2015). Their still exist many factors that continue to hinder women from enjoying equal access to DFS the same way as men. These include limited access to phones and connectivity, lack of information, limited participation of women in the salaried labor force, and lower social-economic status. (International Finance Corporation, 2018). This leads to female headed households being more likely than male-headed households to be poor due to limited economic opportunities and yet women who have access to bank accounts, savings mechanisms, and other financial services may be better able to control their earnings and undertake personal and productive expenditures.

The above challenges faced by women leave men to manage and take care of the economic aspects of the family, to an extent that the economic growth of the women is determined by the economic position and status of their husbands (David, 2016). Women are left with minimal or no control over the family or their own resources. The situation is severe when the woman is the head of the household such as single mothers, widows, or single ladies (Wasike, 2015). These women struggle to engage actively in economic activities which would enable them to provide and support themselves and their families (Kumar & Kumar, 2016). Hence the need to study why this is not being optimally utilized. The G20 leaders in Los Carlos recognize that bridging the digital divide is essential in ensuring men and women contribute fully to the betterment of the society and economy at large. This and the OECD report from the G20 leaders recognize that gender based digital divide is as a result of many challenges women face when interacting with Digital Financial Services.

Digital technologies provide new opportunities to make progress towards economic empowerment, but technological fixes cannot address the underlying structural problems that drive the digital gender divide. Today the digital transformation provides new avenues for the economic empowerment of women and can contribute to greater gender equality (OECD, 2018). The OECD cites challenges that drive the gender divide as, lack of access to digital finance services, lack of education and skills to be able to interact with the services, technology literacy gap, inherent gender biases and social cultural norms. These challenges underpin our study. The World Bank states that there are pronounced barriers that need special attention before women's access to Digital Financial Services increases and further states that overall

women tend to take more time when adopting both new financial services and new technologies due to a variety of factors. (The World Bank, 2014).

The above OECD challenges are global and only differ in the environmental context in which they are analysed. Similarity is drawn from OECD challenges and the World Bank report challenges. The World Bank cites lack of education as literacy issues, social cultural norms as reliance on social cultural networks, inherent gender bias as safe to allow compatibility with simple phones referred to us trust and risk in the study while flexible and simple enough as ease of use. This study analyzed the above challenges of; digital literacy, social cultural norms, perceived trust and risk and perceived ease of use as the specific variables affecting the main objective of challenges of access to and use of digital financial services.

Analysing each challenge, the first challenge which is digital literacy refers to the knowledge and understanding of financial concepts and risks, coupled with the skills, motivation, and confidence to apply such knowledge in order to make effective financial decisions towards the improvement of financial wellbeing of oneself and society (Swamy, 2014). This, however, is a major challenge for women because their inability to use an English-language menu leads to situations where women must rely on agents or male-family members to help them to transact (Chakma, 2014). By giving their information to agents who are often men, women may be setting themselves up for future harassment. The second challenge, which is social cultural norms relate to factors that define common traditions, habits, patterns, and beliefs. They relate to the drivers behind the way people make decisions in a society. Culture is defined as a system that encompasses collective values, ideas, and way of doing things that distinguishes one community from another Storm et al., (2010). This challenge therefore portends to state what is acceptable for women to do, where she can go alone or with whom she can interact with which all serve to limit women's access to digital financial service, Chakma, (2014). Improving access to DFS is core to improving gender equality and increasing the economic freedoms and opportunities that women have, to be able to contribute to their families and societies (Deb & Agrawal, 2017).

The third challenge is perceived risk and trust. According to Ketterer and Andrade (2016), perceived 'risk' and perceived 'trust' remain a central concern for access to and use of Digital Financial Services via mobile money service because when customers experience any potential losses because of innovative technology usage their sensitivity for risk increases. The generated

losses may embrace any adverse effects for customers, like financial loss, privacy breach, performance disappointment, mental distress, or discomfort. Perceived risk means that consumers have doubts, reservations, or potential dangers about the consequence of their purchase decision (Ketterer & Andrade 2016). Perceived risk is typically higher for the product given the distinctive characteristics of a service. A possible obstacle for access to and use of Digital Financial Services could be the potential of exposure in use of mobile money services. The other perceived risk linked with the financial service could be security, privacy, and financial risk.

Ketterer and Andrade (2016), further explore trust as an idea related to the self-confidence, hope, reliability, dependence, integrity, and capacity of an entity. The main problem for a user is a basis of trust in something, in our case the use of DFS. Perceived trust gained separate attention in technology based financial services because of the high level of ambiguity and domain related risk. Perceived trust exhibits the willingness of an individual to take risks to fulfil a need without prior experience, credible, or meaningful information. Thus, user adoption of E-banking is affected by perceived security. This supports a view of security as crucial to the overall usability of electronic banking systems. Internet banking increases convenience, but it also opens a bank to security issues. Example of criminals hacking into the bank's server to acquire bank account data, or a software glitch resulting to the bank unwittingly distributing personal data to the wrong persons. The severity of risk is compounded by the fact that technology is not static (Gabor & Brooks, 2017). Security and privacy which affects trust are increasingly becoming important factors to customers as it influences whether they will choose to adopt an innovation or not, based on the level of security and privacy that the innovation or mobile device offers (Ketterer & Andrade 2016).

Perceived ease of use, which is our fourth challenge refers to the degree to which the prospective user expects the target system to be free of effort (Ghosh & Vinod, 2017). According to Mathieson (1991), perceived ease of use is the consumer's perception that DFS will involve minimum effort. The easier the use of an application is perceived to be by women the more likely its product or service will be accepted by them (Ghosh & Vinod, 2017). Perceived ease of use is important as cited by the Technology Acceptance Model (TAM) developed by Davis in 1989, which proposes that a new system's perceived ease of use determines a person's intention to use it, (Agarwal and Karahanna 2000). Borrowing from this then women would be encouraged to use an easy-to-use system.

The Kenyan government is at the forefront of efforts to harness digital finance technologies to build more inclusive economies. The high growth in mobile phone ownership has triggered a surge of innovative digital tools and services across the country. The recent COVID-19 Pandemic that led to unprecedented global health crisis also led to The Central Bank of Kenya pushing for Digital Platforms to mitigate the spread of the Pandemic through physical contact. Digital platforms were the first set of emergency measures announced on March 16, 2020, by CBK in conjunction with commercial banks and Payment Services Providers (PSPs). The objective being to reduce the risk of transmission of COVID-19 through handling banknotes and coins. However, the benefits of the digital age are not being enjoyed fully by women.

The 2016 Financial Access Household Survey Report captured in Figure 1-1 below indicates Kenya's gender gap in financial inclusion and the usage of financial service providers by gender. The data affirms that women especially those living in poor and marginalized communities are most likely to be on the receiving end of a persistent digital divide and women in Homa Bay County are no exception.

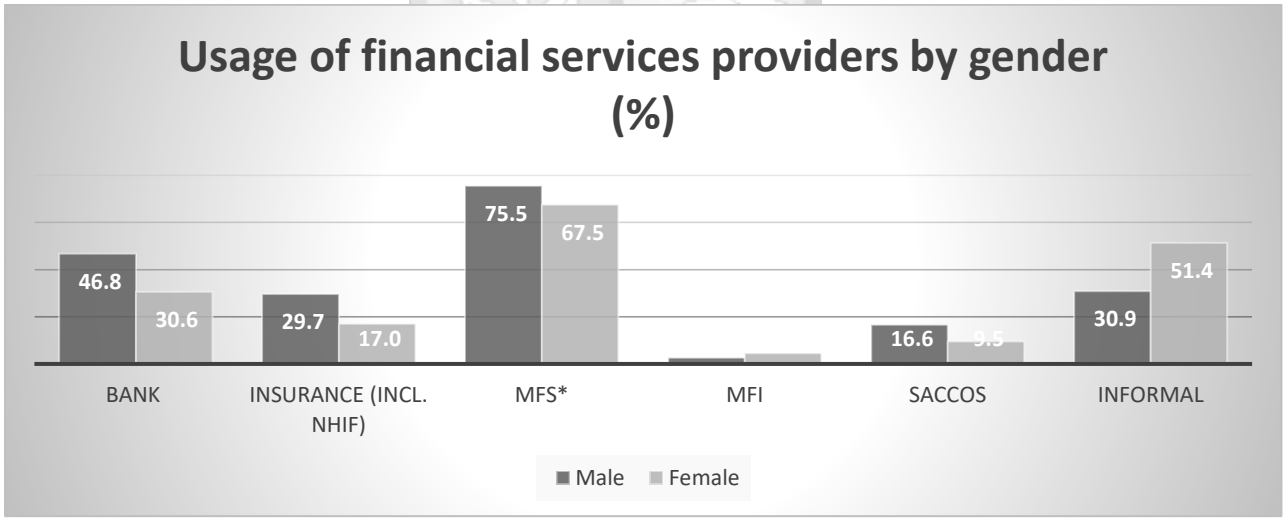

Figure 1-1 Kenya's gender gap in financial inclusions

1.3 Digital financial services (DFS).

Digital Financial Services (DFS) as defined above allows for a broad range of financial services to be accessed and delivered through digital tools. Access to a basic transaction account is critical as it allows people to receive and send payments (TheWorldBankGroup, April 2020). The initial basic transactions of receiving and sending payments will form the basis of this study. It is these basic transactions that allow the transacting of the other services which

include, credit, savings, remittances, insurance among others. Digital channels refer to the internet, mobile phones, Automated Teller Machines, and Point of Sale terminals. By using a diverse range of digital channels and models, DFS can offer personalized services and offerings to the market, reducing or removing barriers associated with the access, usage and quality of financial service that exist with formal traditional financial systems (Ahmad & Muhammad, 2015). The study will focus on mobile phone devices as captured in the DFS definition.

The benefits of Digital Financial Services are contrasted with its challenges as below to accentuate the purpose of the study. Digital Financial Services first have significant potential benefits to expand the delivery of basic financial services via affordable, convenient, and secure environment to the public at large and particularly the poor, through innovative technologies like mobile-phone-enabled solutions, electronic money models, and digital payment platforms, World Bank (2020). It is this benefit that exposes the user to the challenges of access to and use of Digital Financial Services. Financial Institutions and non-Financial Institutions are leveraging digital channels to offer basic financial services at greater convenience, scale, and lower cost than traditional banking allow, Deb and Agrawal, (2017).

Secondly, Digital Financial Services laid the groundwork for speed and convenience in individual and commercial or business banking, World Bank (2020). The spread of personal computer and mobile phones use has added another layer of convenience and speed to the process. DFS allow women to do their transactions at any hour of the day. If DFS users choose to do such things as transfer funds or pay bills, they can do so from anywhere where internet access is available, IFC (2018). For women who own bank accounts, DFS offers bank statements, electronic bill payment, funds transfers, loan applications and transactions, purchasing or sale of investments, all of which allow them to maintain their accounts without making a trip to the bank itself (Ahmad & Muhammad, 2015). Women being mainly responsible for house chores, the benefit eliminates time constraints that are part of social cultural challenges associated with distance & mobility by allowing women to avoid travelling to faraway bank branches and instead bank from the convenience of their homes or workplaces.

Thirdly, in many developing countries, women do not have relevant documents, government-issued identity cards, or even birth certificates required for opening formal accounts to access finances, (G20 Global Partnership for Financial Inclusion) report. Without their own accounts, government benefits and wages often are deposited into a household account rather than a

woman's own account, which compromises the payment's confidentiality and control. Exposing women to perceived risk linked to financial service that could be security, privacy, or financial risk, (Ketterer and Andrade, 2016). Digital money transfers have improved women's financial autonomy and decision-making capacity because the m-transfers are less noticeable to other family members (Kumar & Kumar, 2016). The increased privacy and control help women invest in their businesses, earn higher returns, and improve their labor-force participation.

Fourthly, Digital Financial Services give women the opportunity to save formally, lowering or eliminating the high cost associated with saving informally. The 2014 Global Findex data show that the most common savings method in developing countries is informal, such as gold, livestock, or in the home, or semi-formal using savings clubs or a person outside their family (Deb & Agrawal, 2017). Savings clubs including Rotating Savings and Credit Associations and Accumulating Savings and Credit Associations which are popular for saving informally in many developing countries, especially among women. According to Kumar & Kumar financial literacy which include knowledge of budgeting basics, understanding of finance costs especially impact of interest costs, identity theft, importance of savings and the prudent use of digital finance, can be help alleviate this challenge. (Kumar & Kumar 2016).

1.4 Homa Bay county

Homa Bay county was originally known as Onuno's market and later renamed to Homa Bay by the colonialists who visited the county with the mission to conquer while enjoying the scenic hills and picturesque shoreline. Huma hills' that were slurred as 'Homa' by visitors and its location in the Southern part of Nyanza, along the shores of Lake Victoria - Africa's largest Fresh water lake earned it the name Homa Bay. Homa Bay county has a total population of 1,131,950 persons, with the ratio of female to male being second highest in Kenya counties after Siaya county at 1.10 female for every 1 male. This is slightly above the national average of 1:1. The population is split into 539,560 males and 592,367 females and 23 intersex persons (2019 census) with the county sitting on an area of 3,154.7 km^2.

A study by Population Action International established that Homa Bay County performs below the national average on most socio-economic indicators (PopulationActionInternational, 2009). As seen in Figure 1-2, the county scores a 0.41 on the Human Development Index (HDI) which is below the national average of 0.56, (OCHA, 2015). The status of dismal development is further echoed by 2017 KNBS data on GDP per capita with Homa Bay ranking 34 out of the

47 counties with a GDP contribution of KES 114,198 million of the national GDP of KES 8,196,666 million, this is equivalent to 1.4 per cent of GDP (KNBS, 2017). According to Adhiambo (2003), Homa Bay county's economy is anchored on farming and fisheries with its massive potential on agri-business, mining and tourism remaining largely unexploited. Fishing on Lake Victoria and farming accounts for the largest share of household income in the region but farmers have faced low production in the last decade due to challenges that include lack of access to finance, Action Aid (2001),

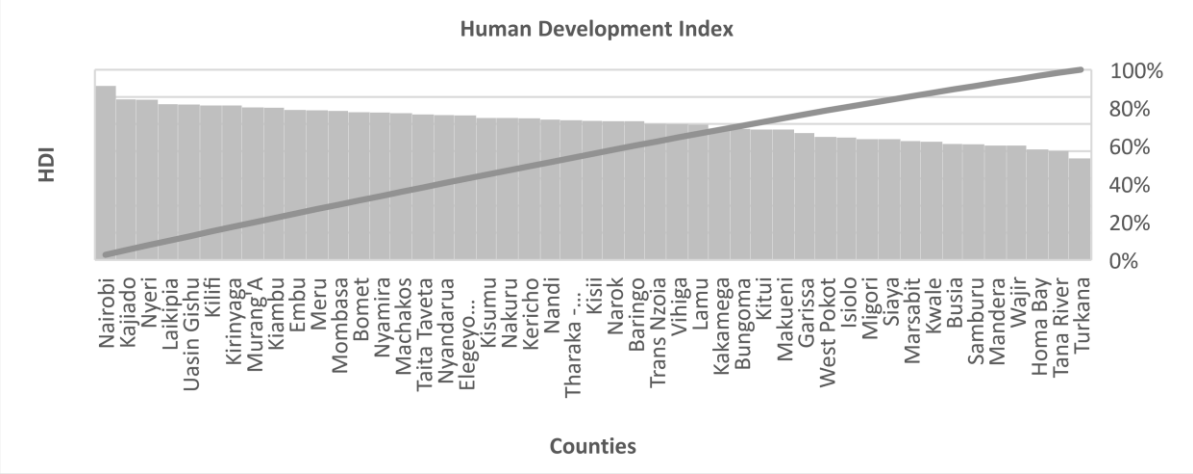

Figure 2-1 Kenya Human Development Indices per county

Access to finance is most difficult in this county. Cultural norms, legal barriers are cited as the root of the limited financial access and use of financial services by women. Adhiambo (2003) posits that more than 25 percent of women in Homa Bay county are financially excluded. Inheritance laws in this county favor men over women thus reducing women's access to family assets and in turn the need and use of financial services. Cultural norms around what is acceptable for women to do, where she can go alone or with whom she can interact all serve to limit women's access to digital financial service, (Chakma, 2014). In Homa Bay county where more than 1.3 million people reside, (Nyambariga, 2013), argues that even when finance is available, stringent terms and conditions, with collateral requirements as high as 150 percent, rendering them inaccessible, particularly to poorer smallholders and SMEs. Poorer people are often turned away by high interest rates and fees that sometimes add up to 233 percent annual percentage rate of charge (APR), according to Microfinance Transparency.

In this community boys are more valued than girls. If a brother and a sister pass examination at the same time and the family has limited resources, the boy will proceed to secondary school while the girl will be left at home. According to a study by Madowo Rose A, 2018 on Gender

differences in completion and dropout rates for primary school education in Homa Bay, it was evident that more boys remain in school until completion compared to girls whether it is at Rural-based or Urban-based schools. Adhiambo, 2003, writes that among orphans, the male orphans are preferred to go for secondary education while the sister with equally good grades is left at home where guardians' resources are scarce. There are parents who discourage their daughters from going to school. They encourage them to get married so that the prospective husbands pay dowry by bringing cows that the mother can milk and 'enjoy life'. Such a parent will not focus on educating the daughter even if this child would like to proceed with her education. The above social factors experienced by women in Homa Bay County are analysed through the findings of OECD report on Bridging the Digital Gender Divide.

1.5 Problem statement

Digital financial services contribute to the increase of financial inclusion of women, but in some countries, it is disproportional and even though access to finance for women is rising, the gender gap is still persistent. (Dr. Alfred Hannig, Executive Director, AFI). The Global Findex Database 2017 cites, 80 million unbanked women receive government wages or transfers in cash, 210 million unbanked women receive cash payments for the sale of agricultural goods, 585 million women pay for utilities in cash and 225 million women pay school fees in cash. In Kenya, two-thirds of unbanked adults are women and the most significant barriers to women's financial inclusion being access to and use of their assets to earn independent income (Demirgüç-Kunt et al, 2018.). IFC reiterates that their still exist many factors that continue to hinder women from enjoying equal access to DFS the same way as men. (International Finance Corporation, 2018)

Women being able to participate formally in the labor market is key, because it is an initial step to financial inclusion to get income paid into their accounts. According to Gabor, women on average are less financially literate and globally, men are likely to be more financially literate than women (Gabor & Brooks, 2017). The inability of women to use an English-language menu leading to situations where women must rely on agents or male-family members to help them to transact (Chakma, 2014). Cultural norms are also contributory, the norms around what is acceptable for women to do, where she can go alone or with whom she can interact all serve to limit women's access to digital financial service, (Chakma, 2014). Studies on consumer adoption and utilization of Digital Financial Services found out that trust and risk are a major concern influencing consumers' decisions to use electronic banking systems, (Ghosh and

Vinod, 2017). Studies by Pearce (2017) also determined that internet fraud led among the list of cybercrimes propagated between the years of 2010 to 2018.

Discriminatory laws on inheritance are cited as limiting women's ability to own land that can be used as collateral, including restrictive documentation needed to open bank accounts (Steinzor, 2003). Wayumba, (2013) also stresses that current land administration systems are complex and have ineffective centralized bureaucratic administrative structures. Incomplete property rights including ownership and control of a phone, limited decision-making power, and pressure from relatives to access money also affect women's ability to use mobile money (Schaner 2016). Lower levels of employment, income, and education negatively are other factors that impact women's use of digital technology (Hilbert 2011). Digital financial services that address customer trust, KYC requirements, transaction costs, digital literacy, and privacy have seen the most success in increasing women's access to and use of digital financial services (Gammage et al. 2017) but sometimes these barriers are embedded in law and are tied to household decision-makers, the person who is named on the bank account, the loan, the mobile phone bill.

The politics of digitization in Africa has brought about disruptive differences (McNamar, 2017). Previous research by Karlan and Zinman, (2010) investigated Africa's emerging digital transformation and concludes that it would have significant effects on both citizens and the economy. This is echoed by Ndemo and Weiss' report, who concluded that technology brought about new access to resources which should be sustained (Weiss and Ndemo, 2016). While the above studies show a positive effect of digitization, Shunko (2012), had a contrary opinion. In his study of the effect of DFS on financial inclusion the results showed that DFS had no effect on financial inclusion but a later similar study by Simavi, (2014) reported that the effect of digital banking on financial inclusion was positive. Data from surveys carried out in Kenya to determine the viability of DFS concluded that several barriers existed that made it challenging to provide these services (Epstein, 2017). Despite DFS having positive impact as per the transformational factors of M-pesa which concluded that the interaction between families through the M-pesa service made relationships better (Morawczynski, 2010). The 2019 Fin Access shows that women at 48 percent compared to men at 58 per cent face barriers in accessing formal financial services.

There is limited research highlighting the challenges of access to and use of DFS among women as seen above. This is further compounded by lack of gender and county disaggregated data.

The data would help understand the demand side usage of DFS in Homa Bay county as guided by Mobile Financial Working Group (MFWG) guideline number 11, (Bill & Melinda Gates Foundation, 2013). The motivation for this study is to contribute to research in this area while assessing the challenges that women face to contribute to the economy and support targeting by ensuring that they actively participate in the financial sectors development and the emerging market economy.

1.6 Research objectives

The main objective of this study is to evaluate the challenges of access to and use of digital financial services by women in Homa Bay county.

1.7 Specific objectives

i. To determine the effects of digital financial literacy on access to and use of Digital Financial Services by women in Homa Bay county, Kenya.
ii. To examine the effect of socio-cultural norms on the access to and use of Digital Financial Services by women in Homa Bay county, Kenya.
iii. To assess the influence of perceived trust and risk on the access to and use of Digital Financial Services by women in Homa Bay county, Kenya.
iv. To establish the effects of perceived ease of use on access to and use of Digital Financial Services by women in Homa Bay county, Kenya.

1.8 Research questions

i. Does financial literacy affect access to and use of Digital Financial Services by women in Homa Bay county?
ii. Do social and cultural norms affect access to and use of Digital Financial Services by women in Homa Bay county?
iii. Does perceived trust and risk affect access to and use of Digital Financial Services by women in Homa Bay county, Kenya?
iv. Does perceived ease of use affect access to and use of Digital Financial Services by women in Homa Bay county?

1.9 Significance of the study

Women face a variety of barriers to access DFS due to low financial literacy levels, social and cultural barriers, perceived lack of trust and risk and perceived difficulty in use associated with DFS. DFS nevertheless has the potential to empower women by offering accessibility,

convenience, privacy and security through new channels such as mobile phones and retail agents (CGAP, 2015). With digital technology, a woman, who may not have otherwise had access to financial services, can open a bank account in her own name. She can plan for her future and the future of her family, build a safety net for times of crisis, and even grow her business with access to loans and other offerings from financial institutions and mobile network operators (Barquin & Vinayak, 2015).

The need to enable more women to participate in Homa Bay county's economy is very clear and at the same time very key towards achievement of the county's main objective of promoting social and economic development and provision of proximate, easily accessible services in the county. Digital Financial Services are instrumental to achieving these goals because they have ability to increase women's financial autonomy, support women's participation in the labour force, and improve the performance of their businesses (Global Partnership for Financial Inclusion, 2012). This research intends to outline these challenges of access to, and use of Digital Financial Services experienced by women in Homa Bay county to inform future positioning of the different stakeholders and hence drive financial inclusion.

The benefits of digital financial inclusion provide a powerful basis for governments, businesses, financial services companies, development organizations and donors to act. The industry players can draw important lessons on how to repackage their services to serve the women segment better while benefiting from women uptake of DFS. County governments can digitize their own wage and government-transfer payments to women and drive financial inclusion, advance customer protection frameworks to help protect women with low financial literacy, and reform discriminatory laws that harshly affect women, such as restrictions on women's inheritance and land ownership (Barquin & Vinayak, 2015).

Commercial businesses can benefit from the knowledge of better targeting of the women population to ensure improved digital infrastructure connectivity, while the financial services sector stand to benefit more by an expanded credit infrastructure, improved credit payment and perceived ease of use. Addressing the gender digital divide will also contribute to the achieving of the UN Sustainable Development Goals (SDGs) especially the fifth goal of Gender equality. To future researchers, the study may help fill significant gaps in knowledge about the DFS landscape in Kenya while contributing to the existing empirical literature on access to and use of DFS particularly by women.

1.10 Scope of the study

The study seeks to evaluate the challenges of access to and use of digital financial services by women in Homa Bay county, the county being among the counties with the lowest numbers of women empowerment strategies. The county has been in the lead in campaigns for empowerment of women through financial inclusion using increased Digital Financial Services. The study was undertaken in Homa Bay town adopting qualitative research design. It was undertaken between January to June 2023.

1.11 Chapter summary

This chapter looks at the background of the research, the problem statement, study questions, the objectives of the research and the significance of the study. This research is divided into four additional chapters. Chapter two discusses literature review of other studies, chapter three looks at the research methodology that was used in the study, chapter four contains results and interpretation of primary data while chapter five *will* look at the summary of findings, the conclusions, recommendations and suggestions for further studies.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter focuses on literature in line with challenges of access to and use of Digital Finance Services. The literature review presents the various theories that anchor the research topic with an analysis of past studies that review the research variables. The chapter covers the theoretical review, empirical review, a conceptual framework, operationalization of the variables, the research gap analysis, and the chapter summary.

2.2 Theoretical reviews

This section discusses the theories underpinning the current study namely theories of Unified Theory of Acceptance and Use of Technology (UTAUT) and Diffusion Of Innovation theory (DOI).

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

UTAUT is a model formulated by Venkatesh and others in 2003 by combining eight previously developed theories with the aim of measuring the level of acceptance and use of a technology. The model suggests that when users are presented with new technology, several factors influence their decision about how and when they will use it (Venkatesh, 2008). The theory looks at four factors; performance expectancy, effort expectancy, social influence, and facilitating conditions and how these factors influence adoption of technology. These factors although not absolutely consistent with the study variable match the study context and are in turn used to analyze their influence on women's access to and use of DFS in Homa Bay County, Kenya. Hence, from the model below DFS access and usage behaviors are predicted to be much dependable on the four aspects of UTAUT.

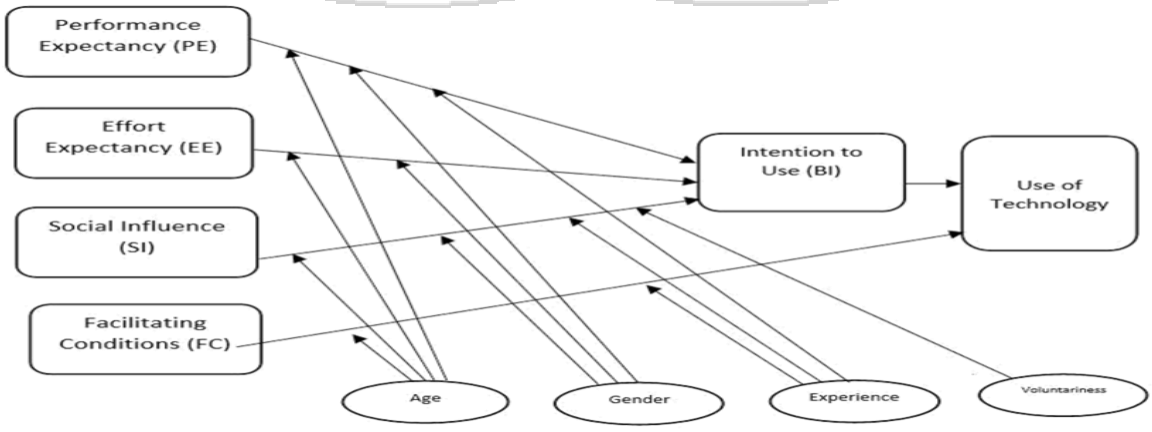

Figure 1-2 Unified Theory of Acceptance and Use of Technology (UTAUT)

Adapted from 'User Acceptance of Information Technology: Toward a Unified View' by Venkatesh et al. (2003).

Magsamen-Conrad et al. (2015) used UTAUT to measure the actual use and adoption of inter-generation tablet PC technology and the result was that the two factors; effort expectancy and facilitating conditions affect positively adoption of inter-generation tablet PC technology. On the other hand, Khechine et al. (2014), used UTAUT to measure the level of acceptance of the webinar system by students and the results of this study indicated that interest in using a webinar system is directly influenced by three of the four independent variables of UTAUT, which are performance expectancy, effort expectancy, and facilitating conditions. Camilleri (2019) examined the user acceptance of e-government services in the form of government agency web pages using the UTAUT approach and the results of this study indicate that this model is suitable for analyzing problems related to technology acceptance. UTAUT constructs such as performance expectancy, effort expectancy, social influence, and facilitating conditions had a positive influence on the ability to use online-based government services.

The above cases portend that there is an opportunity for UTAUT's four factors to influence the access to and use of Digital Finance services. We analyse each of the four factors in relation to access to and use of DFS. The first factor of UTAUT is performance expectancy and according to Venkatesh et al. (2003), performance expectancy is defined as the level at which a person believes that using the system will help in improving their financial condition. The higher the level of trust in use of the system that one has will help him/her get better performance, this is considered to be a very high perception of performance expectations for the system. Venkatesh (2016) states that performance expectations have the most significant influence on system usage compared to the other three variables. Khechine et al. (2014) states that users who have high levels of performance expectations are considered to have a good perception of the m-payment service system. This indicates that there is an opportunity for users who wish to use the DFS services system to be affected by performance expectations.

The second factor of UTAUT is effort expectation and it is defined as the level of ease of use of the system (Venkatesh, Thong, and Xu 2016). An individual's perception of ease of using a system is often regarded as something that tends to affect the desires of the individual using the system. A user who has a high level of effort expectation is considered to have a good perception of the m-payment service system (Liébana-Cabanillas, Sánchez-Fernández and Muñoz-Leiva 2014). Another study by Al-Qeisi (2015) found that effort expectation was a key determinant in internet banking acceptance in Arab countries. The results of this study indicate

the existence of interest to use the system, with the condition that the level of ease of use is acceptable and for this reason, effort expectations can affect the user's intention to use the DFS system.

Social influence is the third construct of UTAUT and is defined as the extent to which a person feels that other people consider important and believe that he must use a new system. Individual's behavior is influenced by the way the individual believes that other persons will perceive their use of technology, (Venkatesh, Morris, et al. 2003). In a study conducted by Mustaqim et al. (2018) regarding the factors that influence the intention to use an e-commerce site, social influence was the only aspect amongst the other UTAUT constructs that significantly influenced the intention to use an e-commerce site. Another study by Camilleri (2019) that measured the level of acceptance of e-government systems produced the same conclusion, that social influence has a significant influence on the intention of using an online system. A user who has a high level of social influence is considered to have a good perception of the m-payment service system and for this reason, social influence can influence the user's intention to use DFS system.

The fourth and last construct is facilitating condition, which is the extent to which a person believes that the infrastructure and facilities that exist do support their intention to adopt technology (Venkatesh, Morris, et al. 2003). The level of trust can be said to be the magnitude of one's perception of facilities that support the intention to adopt technology. A user who has a high level of facilitating conditions is considered to have a good perception of the m-payment service system and this indicates an opportunity for DFS users. Research by Abrahao et al. (2016) regarding the interest in using e-learning in college students favors this belief that effort expectancy has the most significant effect, followed by facilitating conditions. Consequently, the preference of UTAUT as a theoretical framework for this study is not abstract but is founded on the proven validity of this model as a research tool and instrument for understanding the underpinning challenges of access to and use of digital financial services for women in Homa Bay County, Kenya, (Tarhini et al., 2014).

2.2.2 Diffusion of Innovation Theory (DOI)

Diffusion of Innovation (DOI) Theory developed by E.M. Rogers in 1962 originated in the field of technology to describe how an idea or product gathers momentum over time and diffuses or spreads through a certain population or social system. It can also be said to explain

how, why and at what rate new ideas and technology spread. The eventual effect of this dissemination is that people adopt a new concept, habit, or product as part of a social system. Adoption refers to a person doing something differently from what they were doing previously, such as purchasing or using a new product or learning and performing a new activity. Adoption depends on the person's perception of the idea, behavior, or product as novel or unique and diffusion is conceivable to this study because of this.

Rogers argues that four main elements influence the spread of a new idea: the innovation itself, communication channels, time, and social systems. Technology features which constitute the innovation itself, according to diffusionism, are the primary determinants of technical innovation and social growth in a given civilization (UNCTAD, 2021). DFS as an innovation is still in its infancy and its spread is expected to increase exponentially in the coming years (Taylor&Francis, 2014). The theory in this respect supports the analysis of DFS features that will allow its quick diffusion as an innovation. The second feature of DOI which is communication channels in this study equated to DFS channels: the internet, mobile phones, ATMs, have an impact on the likelihood of an idea being accepted or not and hence the study helps critic communication channels characteristics that support the adoption of an innovation in our case DFS.

Time within which adoption of a new idea occurs in our case DFS does not occur simultaneously in a social system, according to Pijpers, Montfort, and Heemstra (2002); rather, it is a process in which certain people are more likely to adopt the innovation faster than others. The people here constituting the social system, inform the third and fourth features of DOI respectively and the same be factors are used to analyse DFS. According to Rogers, DOI is basically the process of the members of a social system communicated an innovation through certain channels over time known as diffusion. The adoption of this innovation went through stages of understanding, persuasion, decision, implementation, and confirmation that led to the development of the S-shaped adoption curve below. Different persons in our case women perceive and adopt an innovation in this case DFS primed by the above factors at different

levels as innovators, early adopters, early majority, late majority, and laggards.

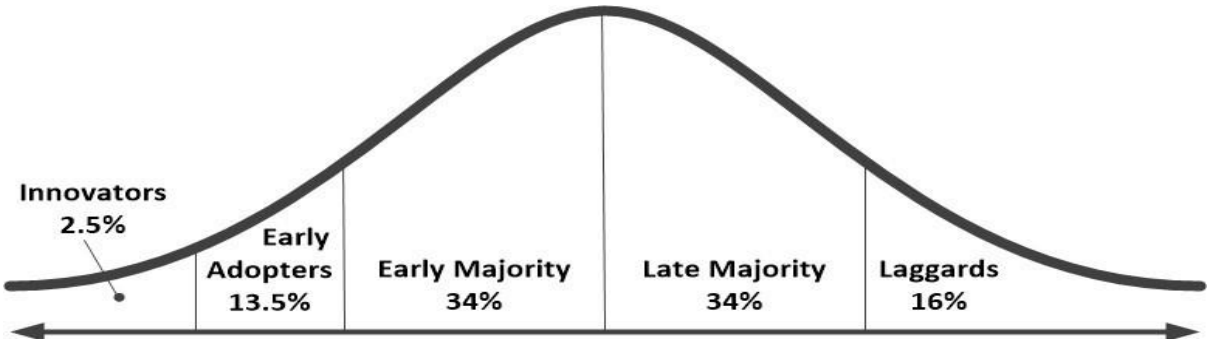

Figure 2-2 Diffusion Of Innovation model

This theory is applied in this study because knowing the different factors, challenges that support women adoption of a technology and at which stage or process these women features fall will support the understanding of their adoption capabilities, timelines and support and aide the targeting of DFS services for maximum impact. Below the DOI conceptual model that cites the factors.

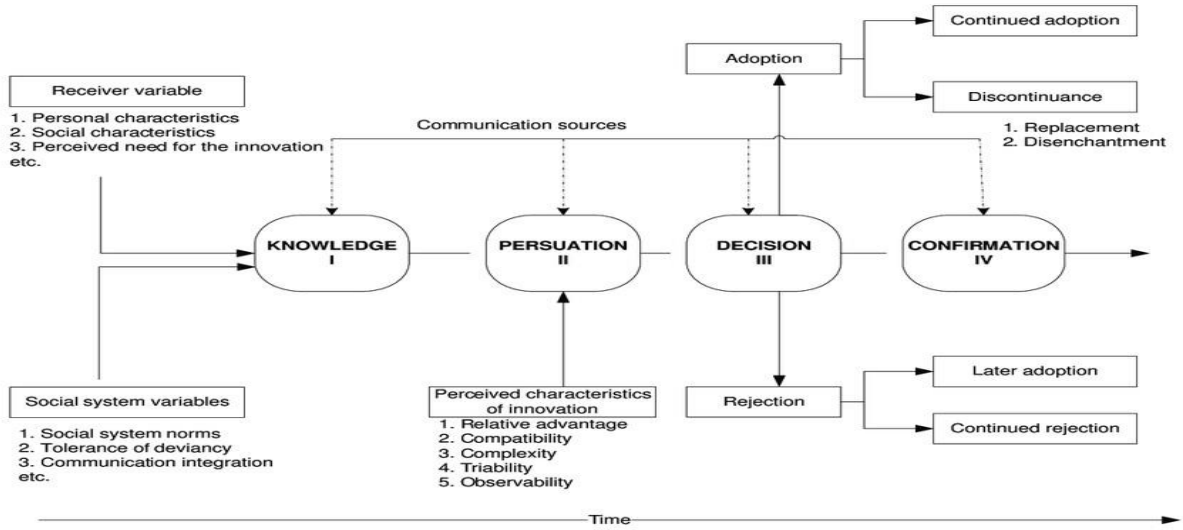

Figure 3-2 Innovation Diffusion Conceptual Model of EM Rogers 1965

2.3 Empirical review.

This section reviews existing literature on the study's objectives; access to and use of digital financial services as the main objective and specific objectives of digital financial literacy, social and cultural norms, perceived trust and risk, perceived ease of use and how they influence the specific objective.

2.3.1 Access to and use of Digital Financial Services

According to (Suri and Jack, 2016), mobile money services a form of DFS has been adopted by vast majority of Kenyan household and has led to increased consumption per capita levels, of the 195000 households whose consumption level increased, the impact was more

pronounced in female-headed households. The study aimed to report the long-term impact the M-pesa had on the economic lives of Kenyan population, it highlights the benefits the DFS has had on the population as; to protect themselves against income and health risks, being able to draw on a wider network of social support and receiving more remittances more quickly from more different types of people in response to negative shocks. The study concludes that there was an increased interquartile impact on financial savings of female-headed households of 22.3%, with a positive influence on the occupational choice at the individual level with higher adoption by individuals more likely to be working in "business or sales," and less likely to be working in farming. The two aspects concentrated primarily among women, this supporting our study that women adoption of DFS has not been fully utilized and has potential for growth. The positive effects were cited as mobile money allow women to directly access remittances and/or have more agency and also because women tend not to be the primary earner in the household, they may have been more constrained before the advent of mobile money. The above forging the basis of our study to explore these challenges that limit women's access and use of DFS.

A study by (Doepken and Tertilt, 2019), titled 'Does female empowerment promote economic development?', however provides evidence contrary to the above and suggests that money in the hands of mothers as opposed to fathers does increase expenditures on children but this does not necessarily mean it promotes women economic development. In this study where the Mexican government implemented a project that increased cash transfer of funds targeting women in poor rural households. The results of the project led to an increase in share of human capital-spending on children, rather than physical capital or land-through savings which was the most important factor of production. (Suresh de Mel et al, 2009) further provides evidence that providing multiple grants to male owners generated larger profit increases as opposed to female owners and concluded gender gaps does not mask differences in ability, risk aversion and entrepreneurial attitude. Further, cited in (Noemi, 2020) where findings suggest a strong heterogeneity between men and women in the role played by financial literacy and digital skills but only men having the propensity of being entrepreneurs.

(Gabor & Brooks, 2017) in Digital Revolution in Financial Inclusion, states that digital revolution helps the state expand the financial inclusion by offering a new layer of assessing persons legible to finance through introducing new ways of finance profiling. This allows poor household to be generators of financial assets. The research sites research gaps as the need for

an in-depth analysis of financial governance and the possibility of emergent forms of resistance to induce new population. (Demirgüç-Kunt et al, 2018.) cites persistent inequality in account ownership, even as account ownership continue to grow the gender gap at 9% remains unchanged. There is need to increase financial inclusion through digital technology, but digital technology is not enough, there is need to ensure that people benefit from the digital technology by addressing the constraints or the challenges to access and use of DFS. Also ensuring DFS is tailored to the needs of disadvantaged groups such as women, poor people, and first-time users of financial services, who may have low literacy and numeracy skills.

(Singh & Priyanka, 2016) concludes that access to financial services such as savings, insurance and remittances are extremely important for poverty alleviation and development. To achieve the goal of total financial inclusion the players in the market must work together. The study highlights the challenges experienced in India as basic financial literacy programs being key to achieve better results in poverty alleviation. (TheWorldBankGroup, April 2020), in its report on Women in Agriculture using DFS looks at the progress DFS has had in alleviating financial access in different countries while extensively exploring the constraints in development of DFS as, conducive legal and regulatory framework, enabling financial and digital infrastructures and ancillary government support systems. These factors resonate with our study's specific objective that we are looking to assess in Homa Bay county.

(Swamy, 2014) analyses the financial inclusion with a gender dimension and the evidence suggest that programs of poor households represented by women had a higher income growth net of inflation at 8.40% as against 3.97% for men. This supporting the significance of the study to assess the challenges of access to and use of DFS in order to support positioning and achieve the goal of increased women's financial autonomy, support women's participation in the labour force, and improve the performance of their businesses (Global Partnership for Financial Inclusion, 2012).

2.3.2 Digital financial literacy

There continue to be gender-based constraints to women's full financial inclusion that also extend to digital systems and explain the persistent gender gaps despite digital expansion. Among these barriers are women's financial literacy and access to mobile technology (Klapper and Hess, 2016). Knowledge about effective use of money for personal finance and business

is an important aspect of leading a healthy financial life (Swamy, 2014). Similarly, is budgeting basics, understanding of finance costs especially impact of interest costs, identity theft and interests, importance of savings and the prudent use of digital finance (Kumar & Kumar, 2016). The McGraw Hill Financial (MHF) - Financial Literacy index, which surveys adults in more than 140 countries around the world on their understanding of concepts such as inflation, discounting, and interest compounding concludes that 75 percent of women (equivalent to 1.5 billion women) in developing countries as financially illiterate compared to 69 percent of men (1.4 billion men).

According to (Gabor and Brooks, 2017), women on average are less financially literate. Globally, men are likely to be more financially literate than women. The study reviews empirical evidence around the world and finds gender differences in financial knowledge, showing that women have lower financial knowledge than men in both developed and developing countries. Women usually are less confident than men about their financial competences and skills due to the challenges that impact their ability to keep pace with men. However, the study concludes with the need for further empirical research to explore in more depth the processes of financial literacy and the limitations that lead to the resistance to efforts to conform. While (Kamlesh Kumar et al, 2021) looking at the power of a financially literate woman from a survey on financial literacy and inclusion in India, his findings emphasize the importance of financial literacy and spousal teamwork in intra-household financial decision-making.

According to (A. Zins & L. Weill, 2016) in their study; the determinants of financial inclusion in Africa, using data from WB Global Findex on 37 countries conclude that education and income have higher influence on financial inclusion and also mobile banking face the same constraints as financial inclusion in women who were one of the population characteristics. (Swamy, 2014) supports this by stating that improved access to financial services via fintech requires higher levels of digital financial literacy to make effective use of them and to avoid miss-selling, fraud such as phishing, hacking attacks, unauthorized use of data, discriminatory treatment, and behavioral issues such as excessive borrowing. Lama and Lamb (2017) in their study on the impact of financial literacy and Internet usage in China found out that financial knowledge can be regarded as a potential risk factor for Internet shopping, their results showed that financial literacy is significantly and negatively correlated with Internet shopping.

(Gabor & Brooks, 2017) found that those who display high levels of literacy are much more likely to read newspapers and magazines, consult financial advisers, and seek information on the Internet. Servon and Kaestne (2018) mentioned that financial literacy, the digital divide, and other issues that separate vulnerable groups from the financial mainstream make it difficult for low- and moderate-income individuals to gain the potential benefits associated with computer banking. Gerrard, Cunningham, and Devlin (2006) investigated why consumers are not using Internet banking. Lacking knowledge is an important factor that affect the adoption of Internet banking. Furthermore, Königsheim, Lukas and Nöth (2017) found that financial knowledge is significantly positively related with the probability to the usage of digital financial services.

Fathima (2018) suggested that focus need to be on empowering women on digital financial literacy. If a household can have a single person who is digitally and financially forward, the government plans and practices can be implemented and achieved. (Gabor and Brooks, 2017) states that, in the attempt to understand the difference between the level of awareness and the level of usage of digital financial literacy, the government and other financial institutions should work towards creating a higher awareness level for financial products and services regarding digital platforms and increase the level of ease to use applications that would help an illiterate person to feel more comfortable by understanding the impact factor of financial education on the financial behavior Shen et.at. (2018). Financial literacy should be given importance and hands-off experience, only when they tend to use the knowledge that is imparted will they be motivated to try every avenue and know more about it (Deb M and Agrawal A, 2017).

The GSMA report (2015) further cites women technical literacy and confidence as barriers to digital financial access and use and states women are more likely to need assistance to use the features of the phone. An example is given of the research by the Grameen Foundation (2014) in India, which shows that multi-step mobile phone menus and the use of unfamiliar syntax were confusing for rural women. Women in the study were pressing '*' instead of '#' as they could not differentiate between them. They were not able to correlate 'answer', 'send', and 'back' with the associated soft key on their handset, and then press the call connect button below it (Grameen Foundation, 2014). In Kenya a total of 29 counties have literacy rates greater

than 90 per cent among young women as per National Bureau of Statistics-Kenya and ICF International, (KNBS, 2017). Homa Bay's literacy rate stands at 64 per cent as provided by the 2019 Kenya census with 66 per cent attributable to the males and 54 per cent females (CBK, KNBS, FSD Kenya, 2019). This rate falls below the average national literacy levels based on World Bank and KNBS data. The Kenya FSD (2009) report goes further to elaborate that 59.5 per cent of the total population is excluded from the use of formal financial services but the exclusion decreases as the level of education increases from 55.9 per cent for those with no education to 8 per cent for those with tertiary education.

2.3.2 Social-cultural norms

Culture is defined as "a set of shared values, beliefs and expected behaviors" (Hofstede in Hayton George & Zahra, 2002) it is viewed as the "underlying system of values peculiar to a specific group or society" (Pinillos & Reyes, 2011, p. 25). Social-cultural theory was put forth by Lev Vygotsky (1931/1997) and from his perspective as persons participate in a broad range of joint activities and internalize the effects of working together, they acquire new strategies and knowledge of the world and culture. In 1980, Hofstede conducted a study that revealed workplace values greatly influence culture, which has significance with digital finance endeavors (Swamy, 2014)

(Gabor and Brooks, 2017) contends that differences in cultural values and attitude tend to influence women, a community that places much emphasis on need of achievement, then failure will be frowned at, which pushes and informs women's behavior on the same. The research concludes with the need for further empirical research to explore the process of self-financial governance. Nichter in the research small firm's growth in developing countries contends that women own and operate majority of MSEs, yet they face challenges that suppress the growth of their firms. The challenges cited fit into the social cultural constructs in our study, and the study concludes with the implications for development practitioners. (Simeon Nichter & Lara Goldmark, 2009). IFC research on Women and DFS in Sub-Saharan Africa shows that men are 5-7 percent likely to own a smart phone than women and when women do own a smart phone, they tend to be older and cheaper. Mobile phones innovation which are the widely used device to access and use digital financial services, according to (Demirgüç-Kunt et al, 2018.) but concludes that even when women do own mobile phones, they tend to use them less frequently than men.

(Gabor and Brooks, 2017), evidence from Senegal, Uganda and Zambia demonstrate that men are more likely to be informed about DFS than women, their relatives and peers form the immediate women's social cultural environment and they do have significant influence on women's engagement in entrepreneurship endeavors. Further, they do shape the opinions and attitudes that women have towards DFS. Poonam and Smita, (2014) states women from families with digital finance backgrounds have a higher chance of engaging in DFS due to inherited family values, compared to those who come from families that are not informed about DFS. Concluding that overall family background and values play a critical role in the DFS attitude of women than general cultural norms or variables associated with the country. In a national survey conducted in the US it was found that a strong positive relationship exists between family role models in DFS and the propensity for the women to be involved in DFS. (Deb M and Agrawal A, 2017). Contributorily, Carswell and Rolland (2014) argue that family social capital is also essential in helping women mitigate challenges associated with women access to and use of DFS. Example of a study in Nigeria where women who had family members or peers in higher places in the society ended up getting favors in accessing DFS while those who did not have family social capital in higher places of the society did not (Swamy, 2014).

There are pro cases also highlighted of how change has led to uplifting women. According to Making Finance work for Africa, 2012, women in Rwanda had the law changed to allow ownership of property, this would be used as collateral (OECD, 2018), while women in Accra Ghana, through Grameen bank explored the use of jewelry as collateral for credit. Contrary to the above progressive changes, Congo still required of married women on opening of accounts to have the approval of their husbands. Similarly, many countries in Sub-Saharan Africa, the Middle East, and North Africa require married women to furnish additional documents to establish their relationship with their husbands for them to get national identification documents. These regulations, therefore, exacerbate barriers that prevent women from the DFS space (Deb & Agrawal, 2017). The above factors therefore contend that women who do not have sufficient motivation to engage in DFS on their own cannot rely on the community for motivation, encouragement, or support.

2.3.3 Perceived trust and risk

Risk and trust are two tools for making decisions in an uncertain environment they pull in opposite directions to determine a user's acceptance. Trust is achievable when there is perception of no risk with risk taken being a measurable byproduct of trust given ("Jøsang, 2004). A study on consumer adoption and utilization of Digital Financial Services found out that trust and risk were major concerns influencing consumers' decisions to use electronic banking systems, (Ghosh and Vinod, 2017). Consumers perceive, in terms of security, that conducting financial transactions online is unsafe (Pearce, 2017). However, knowledge of measures that have been undertaken to secure online transactions like implementing authentication such as passwords, biometrics, and call-backs; network security such as digital certificates, filtering routers and firewalls; hardware security such as smartcards and modems and application security such as encryption would motivate customers to use online banking services (Pearce, 2017).

Risk perception by customers usually arise due to the doubt related to the degree of inconsistency between customers' judgment and real behavior, and technology failing to deliver its' anticipated outcome and the consequent loss. (Ketterer & Andrade, 2016), in embracing access to and use of DFS, cites research evidence of the importance of the perception of risk in deploying new technology or services offered. The research concludes that Digital Financial Services access and use perception of risk is critical due to actual risks emanating from existence of threats to privacy and security, fear of loss of critical information such as Personal Identification Numbers (PIN) and external threats such as hackers who work to gain access to persons' information and accounts. (Poon, 2008). Adds that, some users may have the fear of loss or theft of the technology devices such as mobile phones with stored data. While (Ketterer & Andrade 2016), states consequently perceived risk is more likely to negatively affect access to and use of Digital Financial Services especially by women who are a vulnerable group in the society.

Kenya is severely exposed to online security risk due to limited strategic policies, limited law enforcers engagement with private sector industries, limited knowledge on cyber security issues, lack of enforcement and the passive government participation (Sarma & Pais, 2015). This has led to sophisticated cyber-attacks, malware infestations, website hacking and fraudulent online activities such as phishing and money laundering with internet users suffering the effects and becoming victims (Sarma & Pais, 2015). Studies by Pearce (2017) determined

that internet fraud led among the list of cybercrimes propagated between the years of 2010 to 2018. This makes women shy away from accessing and using digital financial services.

2.3.4 Perceived ease of use

Technology Acceptance Model (TAM) was developed to investigate relationships between use of technology and cognitive/affective factors, (Davis, 1989). TAM proposed that a new system's perceived ease of use determined a person's intention to use it. Agarwal and Karahanna, (2000), further found that computer self-efficacy was a significant determinant of perceived usefulness. However, Venkatesh, (2000), found that perceived ease of use fully mediated the effect of computer self-efficacy on behavioral intention while a study conducted on MBA students by Davis, Bagozzi, and Warshaw (1989), argued that perceived ease of use significantly correlated with current usage and future usage. The results of the above studies demonstrate that perceived ease of use is a significant determinant of people's intention to use online systems.

Extensive research over the past decade provides evidence of the significant effect of perceived ease of use on usage intention, either directly or indirectly (Prabhakar, 2019). Rogers (1962) noted that understanding the technology which consequently leads to adoption of an innovative service/product by customers is known as ease of use. In an empirical study conducted by Chen and Barnes (2017), they found that two technological aspects; perceived ease of use and perceived usefulness, significantly affect customer adaptation intentions. Contrary to the above research, Prabhakar concluded that, the ease of use has no influence on the internet adoption (Prabhakar, 2019) this for a study done in a different environment -Vietnam. Hoang, Igel and Laosirihongthong (2016), still on Vietnamese users and contrary to Prabhakar, pointed out that little experience in using the internet and therefore the ease of use of the online banking website might influence their adoption decision. Similarly, Chong et al. (2010) stated that perceived ease of use might not have a strong influence on technology acceptance but prior experience of technologies, especially prior experience of computers use has an influence on perceived ease of use.

According to TAM theory that weighs in more on the acceptance, if a user perceives a specific technology as useful, she/he will believe in a positive use-performance relationship. Since effort is a finite resource, a user is likely to accept an application when she/he perceives it as easier to use than another. Consequently, technology with a high level of perceived usefulness

and perceived ease of use is more likely to induce positive perceptions. The relation between perceived usefulness and perceived ease of use is that perceived usefulness mediates the effect of perceived ease of use on attitude and intended use. In other words, while perceived usefulness has a direct impact on attitude and use, perceived ease of use influences attitude and use indirectly through perceived usefulness (Ghosh & Vinod, 2017). Digital Financial Services as a new technology for some women, their acceptance of this technology depends on whether DFS can do the same tasks better than traditional banking, if it can provide useful information and be used and accessed easily (Chen, 2014).

The easier the use of an application is perceived to be by women the more likely its product/service will be accepted by them (Ghosh & Vinod, 2017). He argues that the more accessible an information system is, the less effort is needed to use it. In the context of DFS, accessibility refers to not only the physical accessibility of digital connections, but also the global and round-the clock nature of DFS. To support this statement, Ghosh, and Vinod, (2017), state that as the Internet technology becomes more widely accessible households will conduct their financial transactions over the Internet hence the more widespread computer/Internet accessibility is, the greater DFS adoption will be. Tan and Teo (2000) concurred with this argument and postulated that accessibility of digital services is a facilitator of adoption due to its capacity of allowing users to perceive the technology more favorably. Based on the foregoing, we gather that if the supporting technological infrastructures are easily and readily available, DFS would become more feasible and hence accessibility is postulated to be positively related to perceived ease of use (Ghosh & Vinod, 2017).

Prabhakar, (2019) supported the theory developed by Davis. He states that there is a relationship between the perception of ease of use and the perceived minimum effort required. This means that, if women perceive DFS as being easy to use and not technologically complicated, there is a greater likelihood of adoption. This idea is supported by Chong, Ooi, Lin, and Tan (2010) who contend that, given that users do not have face to-face interaction in an internet environment, user friendliness and the ease of use of the websites will lessen the threat to use DFS by the customers. Many of the researchers supported that there is a positive and upward relationship between the perceived ease of use and the probability of adoption of DFS (Prabhakar, 2019).

2.4 Conceptual framework

This is a diagrammatical representation that reveals the relationship amongst autonomous and ward variables. The conceptual framework "sets the stage" for the presentation of the research question that drives the investigation being reported on the problem statement (McGaghie ***et al.,*** 2001). The study's conceptual model is shown by figure 2-3 as follows,

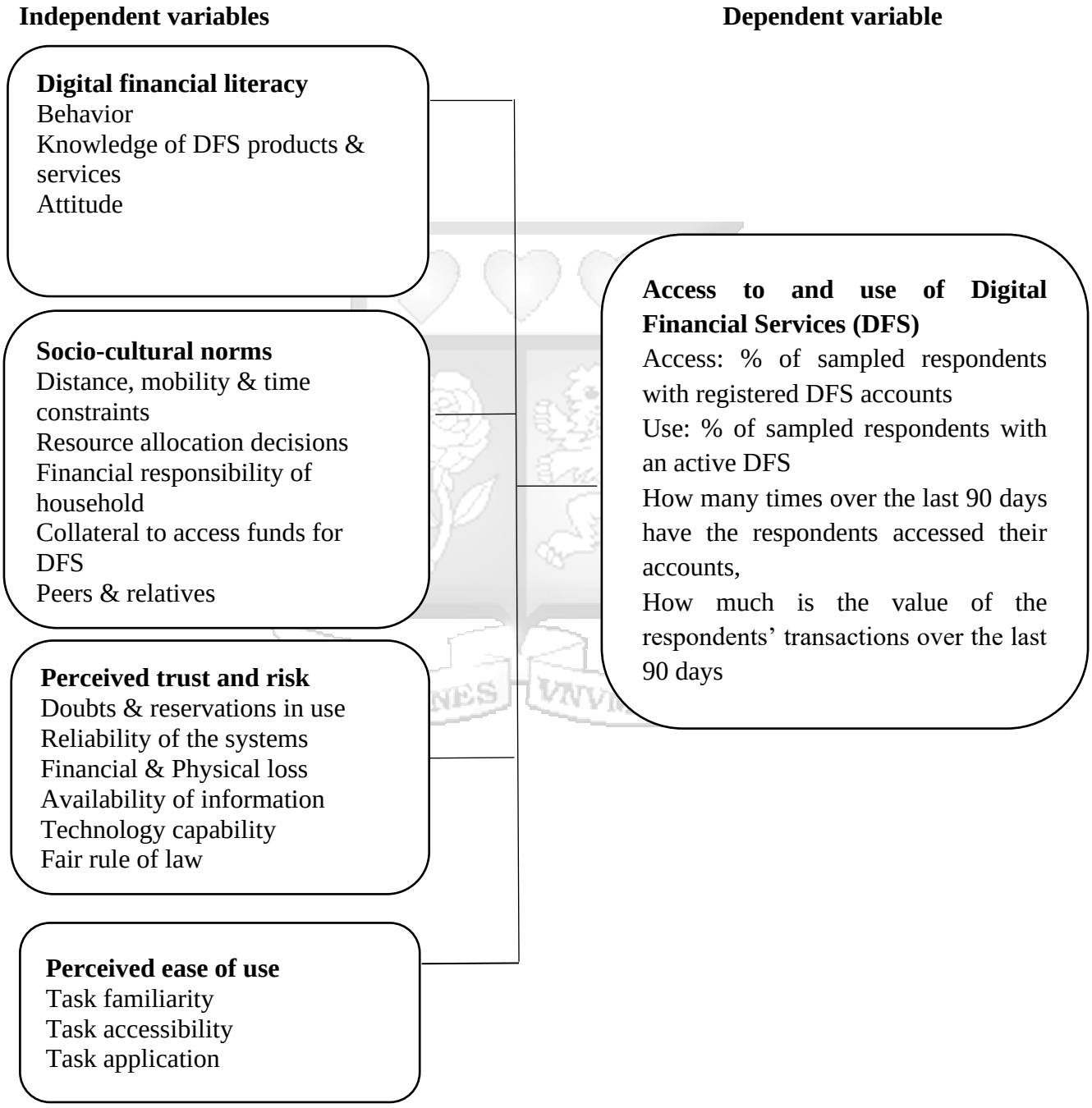

Figure 4-2 Conceptual Framework

Source: Authors

2.5 Operationalization of study variables

Operationalization of this study variables serves to define and measure the main variable of this study, access to and use of Digital Financial Services the independent variable and the challenges, Financial Literacy, Social-cultural norms, Perceived trust &risk, Perceived ease of use as the dependent variables. The indicators are guided by Digital Financial Services Indicators Guideline Note No. 33 (Alliance for Financial Inclusion, 2019), using the published indicators a matrix as below is used to categorize the supply side indicators to our study variables.

Digital Financial Services Indicators

		Demand - side	**Supply - side**				
		Study variables					
	Indicators		Access & Usage	Financial Literacy	Social-cultural norms	Perceived trust &risk	Perceived ease of use
	Access						
1	% of admin units with agent outlet.	×					
2	No. of DFS agents per 10,000 adults.	×					
3	No. of active DFS agents per 10,000 adults	×					
4	No. of merchant payment points per 10,000 adults	×					
5	% of adult population with registered DFS accounts		×				
	Usage						
1	% of active DFS accounts.		×				
2	DFS transactions (by volume) per reg. account.		×				
3	Value of DFS transactions		×				
	Quality						
1	Disclosure requirement				×	×	×
2	No. of complaints per active DFS accounts				×	×	×
3	% of complaints resolved				×	×	×
4	Transaction Failure				×	×	×
5	Dispute resolution				×	×	×
6	Financial literacy			×			

Table 1-2 Digital Financial Services indicators

Operationalization of study variables			
Variables	Description/Definition	Measurement	Source
Dependent Access to and use of Digital Financial Services (DFS)	A process that ensures the ease of access, availability, and usage of the formal financial systems by all members of the society using digital financial tools (Storm et al., (2010).	Access: % of sampled respondents with registered DFS accounts Use: % of sampled respondents with an active DFS (account has been active for at least once in the last 90 days) How many times over the last 90 days have the respondents accessed their accounts, How much is the value of the respondents' transactions over the last 90 days	(Alliance for Financial Inclusion,, 2019) Questionnaire - Ratios
Independent Digital Financial Literacy	Digital Financial literacy is a multi-dimensional concept, with The G20 proposing three dimensions of digital financial literacy	Behaviour: keep track of money, making ends meet, choosing and using products, short- and long-term planning Knowledge: simple & compound interest, inflation, risk & return, risk diversification Attitude: saving-vs-spending, present-vs-future use, risk preference Research questions were designed to assess the above attributes	(OECD/INFE, 2016) Questionnaire – Nominal closed ended.
Social Cultural norms	Culture is defined as "a set of shared values, beliefs and expected behaviours"	A set of statements was used to collect data on these variables that include distance, mobility & time constraints, resource allocation decisions, financial responsibility of household, collateral to access funds for DFS, peers & relatives influence and policy & regulations	(Hofstede in Hayton George & Zahra, 2002) Questionnaire

Perceived Trust and Risk	Perceived trust is the willingness of an individual to take risks to fulfil a need without prior experience, credible, or meaningful information Perceived risk means that consumers have doubts, reservations, or potential dangers about the consequence of their decision.	A set of statements was used to collect data on the variables, doubts & reservations in use, reliability of the systems, financial & physical loss, availability of information, technology capability and fair rule of law	(Ketterer & Andrade, 2016) Questionnaire – Likert scale
Perceived Ease of Use	Degree to which the prospective user expects the target system to be free of effort (Ghosh & Vinod, 2017)	A set of statements on aspects of task familiarity, task accessibility, task application was used to collect data on these variables	(Ghosh & Vinod, 2017) Questionnaire – Likert scale

Table 2-2 Operationalization of study variables

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2.6 Research gap

The evaluation of the different studies identified the research gap as supported by the cases below that this study sought to contribute to

Author	Tittle	Research findings	Research Gap
Access and Use of Digital financial services			
Gabor & Brooks, (2017)	The digital revolution in financial inclusion	The digital revolution adds new layers to the material cultures of financial inclusion, offering the state new ways of expanding the inclusion of the 'legible' and global finance new forms of 'profiling' poor households into generators of financial assets.	Gender gap
Demirgüç-Kunt et al (2018)	Impact of digital finance on FI & stability	Despite the benefits of digital finance, this article highlighted some challenges that digital finance poses for financial inclusion and financial stability.	Gender gap
Singh &Priyanka Tandon (2016)	Financial Inclusion in India.	Access to financial services such as savings, insurance and remittances are extremely important for poverty alleviation and development.	Social cultural norms
World Bank Group	Women in Agric. using DFS.	Digital financial services have the potential to unlock financial services for women in agriculture; however, currently, significant gender gaps exist in DFS access and usage	Challenges to DFS
Swamy (2014).	FI, Gender Dimension, &Economic Impact on Poor Households	Notices that income growth (CAGR) net of inflation effect was 8.40% for women as against 3.97% for men, indicating that the gender of participating poor undoubtedly affects the outcomes of these programs.	Quantitative gaps exist.
Digital financial literacy			
Gabor & Brooks, (2017)	Gender differences in financial knowledge	Women have lower financial knowledge than men in both developed and developing countries and women usually are less confident than men about their financial competences & skills due to the challenges that impact their ability to keep pace with men.	Digital Financial Literacy

Swamy, (2014)	Digital financial literacy and the digital age.	Improved access to financial services via fintech requires higher levels of digital financial literacy to make effective use of them and to avoid miss-selling	Gender gap
Lama and Lamb (2017)	The Effects of Financial Literacy, DF Product &Internet Usage on FI in China	Digital financial product usage and financial inclusion were significantly related, improving the financial literacy of residents and popularizing the Internet	Gender gap
Social and cultural norms			
Swamy, (2014)	Hofstede four-dimension model	Workplace values greatly influence culture, which has significance with digital finance endeavors.	Digital Financial Services
Figura (2012)		A community that value masculinity, individualism and power distance have significant relations with women behavior.	Social cultural challenges
Pathak et al., (2011)	Hofstede four-dimension model	High power distance cultures do have unequal distribution of power that influences how control mechanism in DFS is organized.	Women in informal sector
Nichter (2009)		Societies with high individualism do value autonomy and freedom more and view DFS use and access as an individual rather than community endeavor.	Gender gap
Perceived trust and risk			
Ghosh &Vinod (2017)	Consumer adoption & DFS utilization	The research found out that trust and risk were major concern influencing a consumers' decision to use an electronic banking system.	Gender gap
Kettere&Andrade (2016)		When customers experience any potential losses because of innovative technology usage this may increase their sensitivity for risk	Gender gap
Pearce (2018)		Measures undertaken to secure online transactions such as implementing authentication would motivate customers to use online banking services	Gender gap
Perceived ease of use			
Gabor & Brooks, (2017)	Accessibility a multidimensional construct	The more accessible an information system is, the less effort is needed to use it.	Gender gap

Chen and Barnes (2017)		Found out that two technological aspects, perceived ease of use and perceived usefulness, significantly affect customer adaptation intentions in Vietnam.	Gender gap

Table 3-2 Research gap

2.7 Chapter summary

The chapter reviewed theories that anchor access to and use of Digital Financial Services by women while looking at past literature linking access to and use of digital financial services to challenges of digital financial literacy, socio-cultural challenges, perceived ease of use and perceived trust and risk.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology that the researcher used in the study to evaluate the challenges of access to and use of Digital Financial Services. The research methodology looks at research philosophy, research design and the target population. The population is evaluated through sampling design, techniques, and size. Finally, the chapter describes the data collection methods, data collection procedures, data analysis methods how to ensure data quality and ethical considerations.

3.2 Research philosophy

According to Creswell (2014), research philosophy is the underlying belief held by a researcher on the way data for a particular study should be collected, analyzed and applied and provides an explanation for the assumptions that people make about nature of reality. This study was guided by x research philosophy providing a good understanding of the challenges of Digital Financial Services and how this limits access and use by women in Homa Bay county.

3.3 Research design

The study applied cross-sectional descriptive survey research design applying largely quantitative methods. This research design enabled the researcher to gain insights on how the highlighted challenges affect the access and use of DFS by women in Homa Bay county. The research tools used were questionnaires and in-depth interviews. Primary data was obtained from filling and interviewing women in Homa Bay town on a market day where women travel from the different counties to Homa Bay town to sale their wares. Secondary data was obtained from different websites like Safaricom, Central Bank of Kenya and the Kenya National Bureau of Statistics and further interviews from key informers to support the data.

3.4 Population of the study

The population in this study was women in Homa Bay county as defined by Denscombe (2014); the population is the entire set of cases from which a sample is drawn and consists of elements with similar characteristics that the researcher wishes to examine and generalize their findings. According to the 2019 census report the population in this study was 592,367 females in the county of whom 65% (target population of 385,039) were above the adult age of 18 years (KNBS, 2019).

3.5 Sample design and technique

Survey research method was applied for data collection because of its benefit of being inexpensive and effective in situations where large sample sizes are required, as well as offering an accurate and reliable representation of the variables under investigation. According to Sue and Ritter (2011), survey method is optimal for gathering original data because it provides a high level of accuracy. The study's sampling frame comprised all women Digital Finance Services users aged from 18 years and above residing in Homa Bay County.

The study adopted a probability sampling technique where every member of the population will have an equal chance of being chosen and participating in the study (Denscombe, 2014) and in our case every woman in Homa Bay County will have a chance to participate. Further, simple random sampling was used as it is easy to use and has accuracy of representation. It also has the benefit of minimized classification errors, free from bias and prejudice (Kothari (2014). The sample size was computed using the formula:

$$n = \frac{\lambda^2 \, p \, (1-p)}{d^2}$$

Where:

n is the required sample size.

ƛ is the value based on confidence level, market research recommends 95% with value of 1.96

p is the sample proportion typically set at 50% (0.5).

d is the margin of error, a good margin of error ranges from 1-10%, 5% is recommended

Substituting for the formula, the sample size will be determined as below:

$$\eta = \frac{1{\cdot}96^2 \; 0.5(0.5)}{0.05^2}$$

= 384 is our sample size

3.6 Data collection methods

Primary data was collected using surveys - a type of data collection approach that entails collecting information from a group of people in a systematic manner using questionnaires (Creswell, 2014). A structured questionnaire was physically administered to randomly selected women respondents face-to-face in June 2023 in Homa Bay town on a market day. On the market day women travel from all the eight sub-counties to sell their wares at Homa Bay town this will ensure fair representation with each sub-county highlighted in the questionnaire.

This study collected data physically using a two- stage cluster sampling method. The first stage included clusters composed of the different types of business undertaken in the market. The second stage was simple random sample questionnaires administered to the selected responders within the cluster. An introductory letter was shared and discussed by each of the randomly chosen respondents prior to giving and sharing of the questionnaire, seeking their participation, and explaining the reason for the study. The above was done to support genuine responses to the questionnaires comprising open-ended and close-ended questions, multiple choice questions, rating scales and Likert scale to support data collection.

3.7 Data collection procedures

A pre-test survey was administered to ten female respondents before the main survey's administration. This was done to field-test the questionnaire's validity as well as confirm that it was properly developed. Suggestions from the pre-test group was used to improve perplexing questions, resulting in a research instrument that is relevant, logical, easy to fill out and concise.

The first component of the questionnaire aimed to determine the respondents' socio demographic background, which included age, relationship status, level of education, constituency, source of income and income bracket. The second section had both open and closed ended questions on access to and use of digital financial services, the third section included YES/NO questions on digital financial literacy, the fourth section comprising ticking the factors that apply to establish the socio-economic norms, the fifth and sixth section consisting of Likert scales to establish the weight of the different elements of perceived trust and risk and perceived ease of use.

To achieve a high response rate, the researcher employed research assistants with the local language bias to help interact with the respondents. The research assistants were trained to ensure they have clear and good understanding of the research objectives, research questions and data

collection procedures. In addition, the questionnaires were accompanied by an introductory letter that provides background information on the researcher. The letter further guaranteed confidentiality besides seeking the consent of the respondents before administering the questionnaires.

3.8 Data validity and reliability.

Reliability of a research instrument concerns the extent to which the instrument yields the same results on repeated trials. The tendency toward consistency found in repeated measurements is referred to as reliability (Carmines and Zeller, 1979). The researcher tested for reliability of the questionnaire using internal consistency method which yields an internal consistency reliability estimate. This technique involves splitting the questions of the questionnaire into two halves and correlating them. If a questionnaire is reliable, then correlation between the two halves is significantly either 70% or 0.7 or higher. The questionnaire was tested for reliability at piloting stage and attained a reliability coefficient of 0.842 which implied that the tool was adequately reliable for the main study.

On validity, a research specialist reviewed the questionnaire before it was distributed to ensure content legitimacy and content validity to assure that it effectively measured the theoretical constructs in the question (Creswell, 2014). Unclear questions were rewritten, and the questionnaire sent to supervisors for further assessment and critique. The pre-test with ten respondents helped to ensure that the questions would be answerable with ease and clarity.

3.9 Data analysis methods.

On receiving the data, the researcher reviewed it by looking for missing data or incomplete sections of the questionnaire. Data cleaning and editing was completed using user-friendly and accurate coding. Descriptive and inferential statistics were used to define data characteristics and provide a summary of the sample (Denscombe, 2014). The reporting uses the mean, frequency and standard deviations in descriptive statistics while inferential statistics comprise Peason Correlation Coefficient, F-statistic and Chi-square statistic.

To analyze objective one, tests of mean differences and Pearson chi-square test of independence are done to assess the *Alternative Hypotheses* of any association between KAB elements of digital financial literacy (independent variable) and utilization of DFS by women (dependent variable). A test of independence was conducted to evaluate whether the nature of DFS services accessed

and utilized differed due to the above indicators. Data related to objective three was analyzed by weighting scores of levels of respondent agreement in a range of 1 to 5 whereby 1 implies they strongly agree while 5 shows that they strongly disagree. The weights were then used to investigate whether any variations in DFS use (logins, duration of use and type of service) were statistically important (significant) enough to indicate the presence of relationships attributable to perceived risk. Two analytical techniques employed with the first one testing strength of association (correlation coefficient) between perceived trust and DFS use; the second statistic (chi-square) derived from contingency tables cross-tabulating perceived trust and DFS use tested lack of independence between the two variables. Finally, data for research objective four was analyzed by weighting scores in a way that they fell in a range of 1 to 5 whereby 1 connotes they strongly agreed and 5 that they strongly disagreed. The weights were then used to investigate whether any variations in DFS use (logins, duration of use and type of service) were statistically important (significant) enough to indicate the presence of relationships or effects attributable to perceived ease of use.

Only relationships whose statistical parameters attained significance at 5% level of testing or lower are reported and show mixed relationships between perceived trust and risk against DFS use. Numeric data for all findings are presented in Chapter 4 via tables, charts, and figures.

3.10 Ethical considerations

When performing this study, the researcher expects ethical concerns to surface, thus it is critical to protect participants and earn their trust. Data security has recently gained traction and according to Grand View Research, the global data security market will grow to reach $15.5 billion by 2024. The report reveals the need to protect sensitive information such as intellectual property and consumer's personal information. Participants in the study are likely to be hesitant to participate in such a study, especially when seeking personal information, the researcher ensured confidentiality clause is part of the questionnaire and during the data cleaning the data set will not contain information that identifies the respondents.

Furthermore, to ensure the respondents are comfortable to participate in the research an explanation of the purpose of the research was shared clearly stating who the recipient of the research is and facilitated dialogue channels on the use of the data. Prior to undertaking the research, permission from the institution was sought. The university's Institutional Review Board

provided its approval to the survey (IRB). Participants were not compelled to take part in the survey and anonymity was preserved for individuals wishing to participate. The key incentive for this study was the promise that the survey results will be shared with the respondents as a way of encouraging them to complete the questionnaire.

3.11 Chapter summary

The methodology and procedures were used to carry out the study have been detailed in this chapter. It began with an introduction that outlined the chapter's overall methodology and organization. The method employed to perform this research, as well as its reason are also discussed. The population was defined, the sampling procedure demonstrated, and the sample size explained. Finally, the research methods and data collection approach used in the study are reviewed.

CHAPTER FOUR: PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

This chapter presents responses to the research findings from the questionnaires. The study's independent objective variables are analyzed against the study's main objective indicators to check for relationships. The data collected is analyzed by SPSS and Stata software with the results being presented with the aid of tables, pie charts and bar graphs. The chapter opens with a highlight of the demographic attributes of respondents followed by a presentation of descriptive statistics before reporting on effects of digital financial literacy, socio-cultural norms, perceived trust and risk and perceived ease of use on Digital Financial Services by women.

4.2 Response rate

The study was conducted in Homa Bay county on a market day. The study sampled 384 women, obtaining a 91 per cent response rate which is equivalent to 350 women respondents. This response rate was satisfactory as suggested by Cooper and Schindler (2014), who posits that a response rate that is above 60 per cent of sampled respondents is deemed adequate.

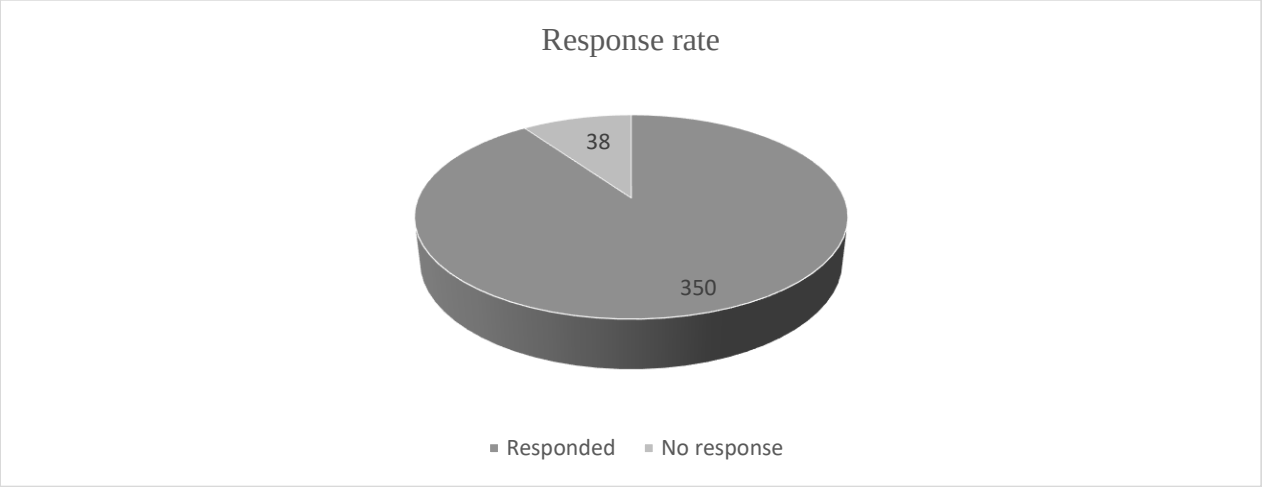

Figure 1:4 Study response rate

4.3 Demographic Information of the Respondents

4.3.1 Age of Respondents

The research examined the respondents' age profile, and the results are presented in Table 4.1 below.

Table 1-4 Distribution of respondents' age profile

Age bracket in years	Frequency	Percent
Below 18	43	12%
18-24 years	108	31%
25-60 years	157	45%
61 and above	42	12%
Total	350	100%

The results show that the highest number of the participants, 45% (n=157), were aged between 25 and 60 years old. Another 31% (n=108) were aged between 18 and 24 years with the lowest number of participants at 12% (n=43) for ages below 18 and above 61 years as shown in the above data. The bulk of women having access to and use of Digital Financial Services activity in Homa Bay county was respondents aged 25-60 years.

4.3.2 Relationship status of Respondents

The study further explored the relationship status of the respondents, and the result were as indicated below.

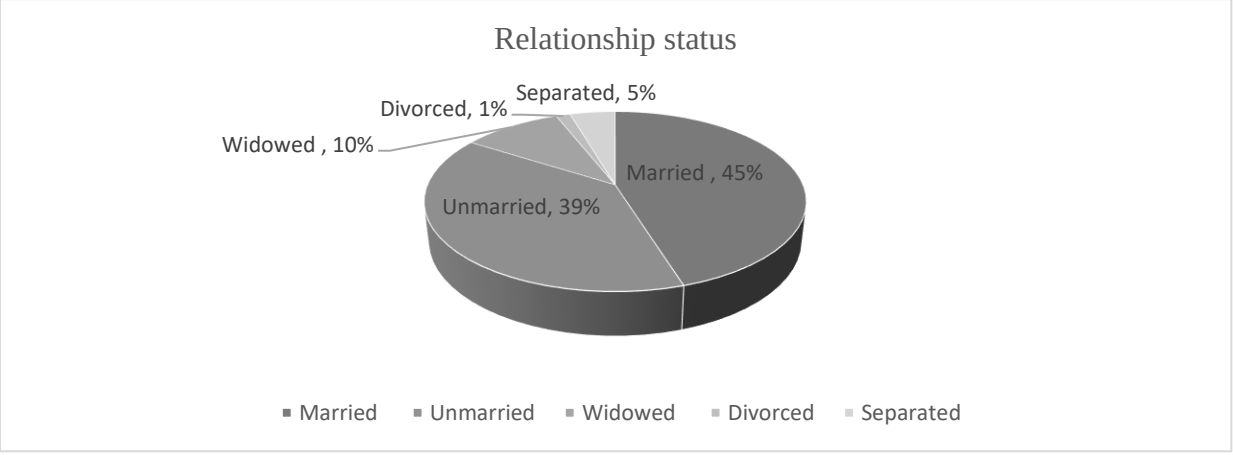

Figure 2:4 Relationship status of respondents

Almost half of the population that responded were married at 45% followed by 39% who were not married. Further, 10% of respondents were widowed while those that were separated and divorced constituted 5% and 1% of the sample respectively.

4.3.3 Education Level of Respondents

The response rate as per the education levels parameters is indicated in Figure 4.3.

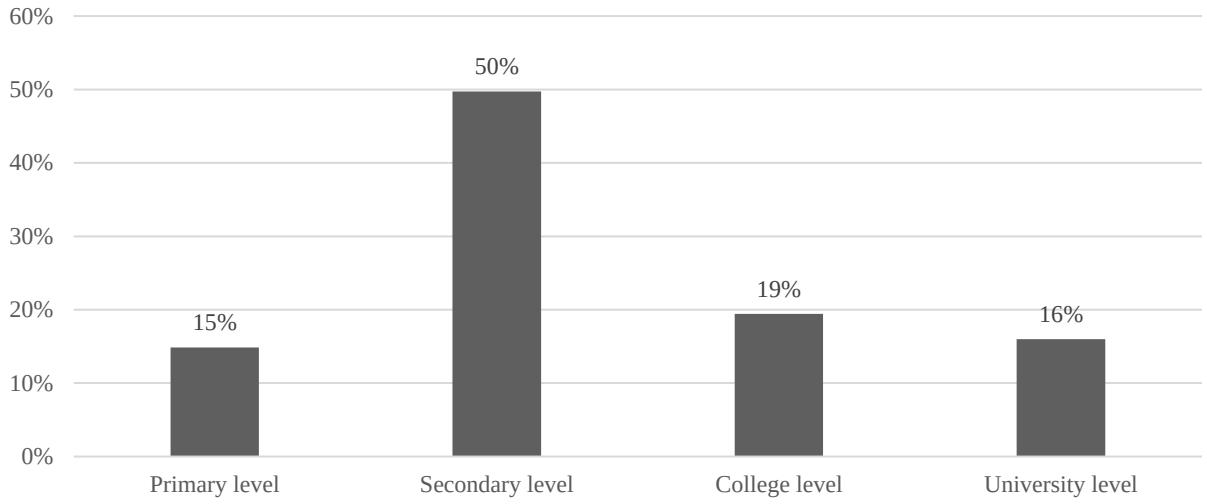

Figure 3:4 Education level of respondents

The data collected indicates that 50% of the respondents as had finished secondary education, 19% have a college education, 16% having completed university and 15% with primary level education. Swamy (2014) links education qualifications with digital financial literacy and so it may be assumed that women with college and university level of education in Homa Bay county may have had higher utilization of DFS than their counterparts.

4.3.4 Income Profile of Respondents

The leading source of income for 46% of the women was business, 23% of respondents were employed while 31% made a livelihood from other income sources including from their spouse. Distribution of monthly income bands indicate that 64% of the respondents earned up to Kshs 23,670, another 32% earned a range of Kshs 23,671-119,999 while only 3% earned Kshs 120,000 or more. More information on income is contained in Figures 4.4 and 4.5.

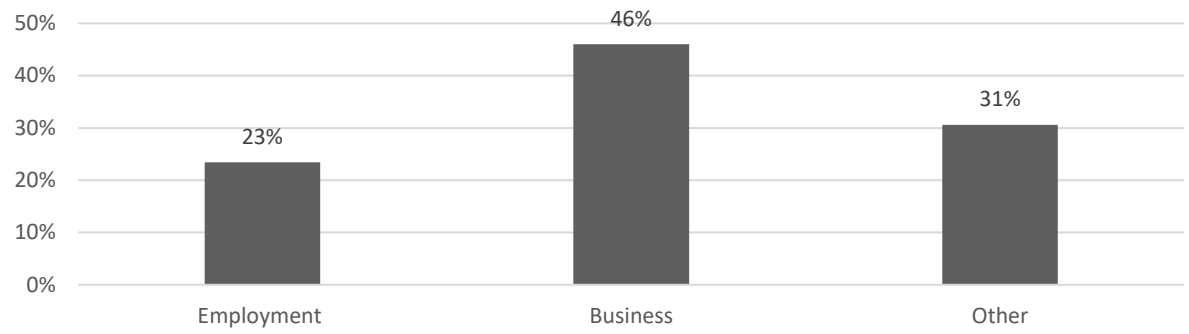

Figure 4:4 Source of income

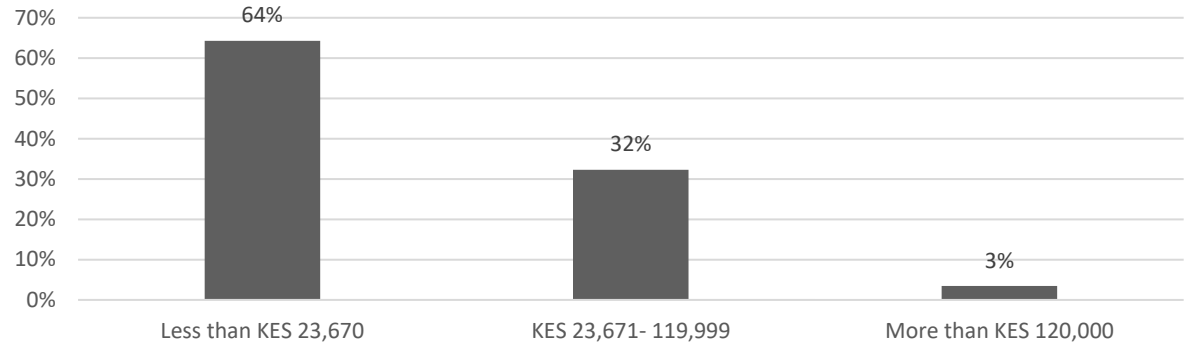

Figure 5:4 Income bracket of Respondents

4.4 Descriptive analysis results

Section 4.4 presents descriptive frequencies and measures of central tendency from various variables pertaining use of DFS, duration during which respondents had used their digital finance services, estimate number of times respondents logged into their registered digital finance service per day, nature of DFS services utilized, financial literacy status, social cultural challenges affecting DFS use, perceived trust and risk and perceived ease of use.

4.4.1 Access to and use of Digital Financial Services

A record of registered digital finance service account that women in the sample had used in the recent past indicated that a majority of them (94%) had used M-pesa service and 3% had used Airtel Money. Another 3% had used none of the services with Yu Cash having had no usage at all. Reasons for non-use ranged from heavy reliance on cash to lack of float in their digital wallets.

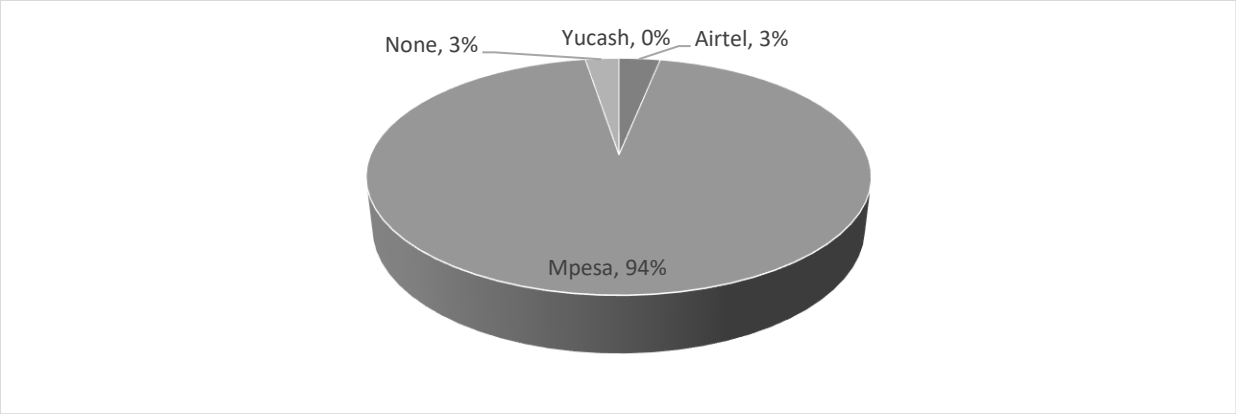

Figure 6:4 DFS account wallets utilized

Cumulatively, 77% of the respondents had used their digital finance services for over 3 months, 14% of them had used the service for a duration of between 1 and 3 months with 6% having used digital finance services for less than 30 days. Inquiry on the estimate number of times respondents logged into their registered digital finance service per day showed that majority of the women made between 1 and 5 daily log-ins to their devices for DFS activity on average whilst less than 2% made more than ten DFS log-in sessions.

Table 2:4 Usage duration of digital finance services

Usage duration of DFS	Frequency	Percent
Less than 30 days	22	6%
Between 31 to 90 days	48	14%
More than 90 days	271	77%
Never	9	3%
Total	**350**	**100%**

Receipt of money and payment of bills topped the reasons for which women frequently used the digital finance at 49% and 37% respectively with savings coming third among 11% of respondents. Online shopping and other purposes were cited by only 3% of women.

Figure 7:4 Purpose of use of digital finance

Slightly more than half of respondents (54%) reported having ever lost any of their digital devices such as mobile phone, laptop, iPad through theft. Despite such challenges, 93.4% of the sampled women said they are very likely to recommend the use of digital financial services to their friends.

4.4.2 Digital Financial Literacy

Nearly all (97%) of the respondents owned digital devices such as phones, tablets, laptops, watches whilst 94% had a good understanding of basic use of the digital devices. A high 96% reported ability to operate digital finance services account like M-pesa and Airtel money including using their devices to carry out online transactions such as payment and savings. In addition, only 15% of the women had ever attended any trainings or seminars on digital financial literacy.

Table 3:4 Ownership of digital devices against digital competency

		Has a good understanding of basic use		
		No	**Yes**	**Total**
Owns a digital device	No	5 (1%)	6 (2%)	11 (3%)
	Yes	17 (5%)	322 (92%)	339 (97%)
	Total	**22 (6%)**	**328 (94%)**	**350 (100%)**

Investigation of the behavior on awareness of DFS risks and risk control measures showed mixed levels of caution against risk exposure of users. Whereas 86% used passwords to protect their digital devices, 21% used the same password across multiple user accounts or devices while 15% shared their passwords with other people.

Table 4:4 Awareness of DFS risk exposure

	User had a password	Shared the password across devices	Shared the password across people
Yes	302 (86%)	74 (21%)	54 (15%)
No	48 (14%)	276 (79%)	296 (85%)
Total	**350 (100%)**	**350 (100%)**	**350 (100%)**

Moreover, only 43% of the women respondents were aware of what antivirus referred to with 55% of them having ever suffered financial loss while using digital financial services. On the attitude and knowledge of consumer rights, redress and support 88% of the sample respondents said they read the terms and conditions stated on digital services before use[1]. At the same time, 67% did ask and check for receipts and statements of online transactions while two-thirds had knowledge of support contact details to call when in need, 90% preferred transacting through agents while a fifth had attended trainings or seminar on consumer rights and protection.

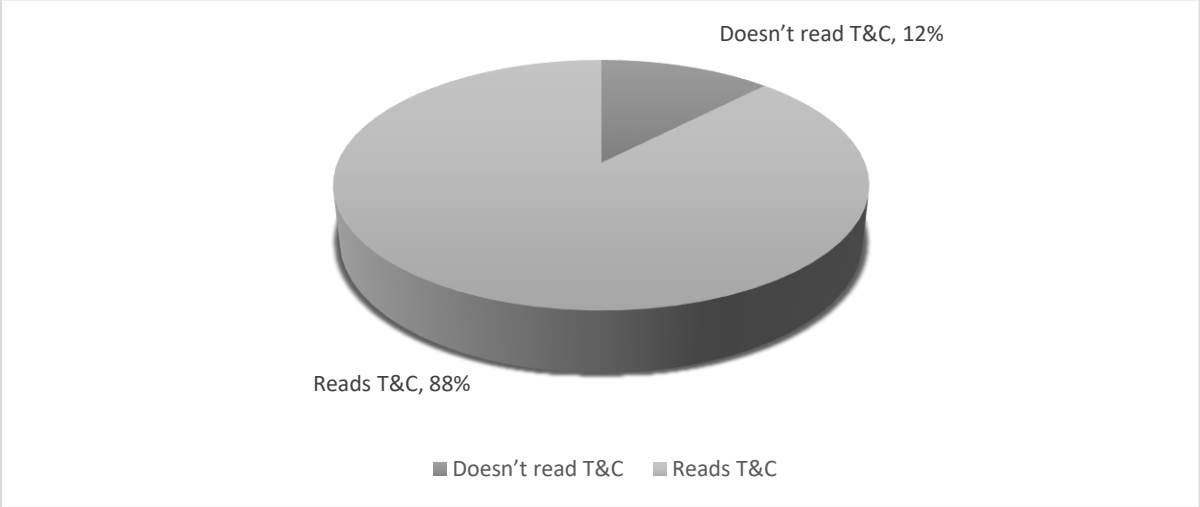

Figure 8:4 Proportion of respondents who read terms and conditions of using DFS

4.4.3 Cultural Challenges

Respondents were asked to identify which social cultural factors affected access and use of digital financial services. Table 4.5 shows that the biggest barriers are lack of knowledge of DFS benefits

[1] This is high, compare with literature

thus preference of informal savings (11.7%) and mobility issues plus distance constraints accessing DFS agents (11.7%). Also following closely are lack of collateral to access funds to support DFS activities among 11.5% of respondents, lack of time due to household activities (8.6%) and discriminatory laws (7.8%). Among the least important factors included negative influence by an over-intrusive spouse or lack of social capital from home.

Table 5:4 Social cultural factors affecting use of digital financial services by women

Social cultural factors[a]	Responses		Percent of
	N	Percent	Cases
Lack of time due to household activities	149	8.6%	42.8%
Lack of resource allocation decisions for the household	108	6.2%	31.0%
Lack of financial responsibility for the household	108	6.2%	31.0%
Lack of collateral to access funds to support DFS activities	199	11.5%	57.2%
Lack of freedom and being monitored by spouse	77	4.4%	22.1%
Lack of access to DFS information or it is limited to friends & family	113	6.5%	32.5%
Lack of values and DFS knowledge within family members	107	6.2%	30.7%
Lack of community support, social stigma &cultural taboos associated with DFS	129	7.4%	37.1%
Lack of Identification documents required to open a DFS account	126	7.3%	36.2%
Lack of knowledge of DFS benefits and hence preference of informal savings	203	11.7%	58.3%
Lack of mobility plus distance constraints to access DFS agents	202	11.7%	58.0%
Lack of laws supporting women use of DFS instead discriminatory laws & regulations	135	7.8%	38.8%
Lack of social capital like supportive parents instead I am discouraged by parents	77	4.4%	22.1%
Total	**1733**	**100.0%**	**498.0%**

a. Group (this is a multiple response variable with each respondent choosing an array of answers ranging 0-13)

4.4.4 Perceived trust and risk

Respondent's perceived trust and risk with digital finance was assessed attitudinally using statements ranked on a Likert scale ranging from 1 to 5 to measure the level of extent to which they agreed or disagreed with the proposed statements. From the results in Table 4.6, it is clear that respondents' level of agreement with the statements of perceived trust and risk was somewhere in the middle leaning towards disagreement. This is because since a weighted mean score of 2.7 out of a possible 5 points was attained (54% overall level of disagreement). From survey data we calculated a weighted mean based on the Likert scale of 1 being 'strongly agree' and 5 being 'strongly disagree'.

Table 6:4 Perceived trust and risk

Statement of trust and risk	1=Strongly agree	2=Agree	3=Not sure	4=Disagree	5=Strongly disagree	Weighted Mean
I have doubts and reservations in the use of digital devices to transact	9.7%	12.6%	20.0%	47.3%	10.2%	3.4
I think the digital financial services systems are reliable & dependable to use	27.7%	51.4%	11.7%	3.1%	6%	2.1
I have ever suffered financial loss while using the digital financial services	20.3%	34.0%	16.3%	20.6%	8.9%	2.6
I have ever suffered physical loss of my digital financial device	10.6%	25.4%	13.4%	26.9%	23.4%	3.3
I think that there is enough information to support knowledge of measures to secure online transactions	12.0%	26.6%	39.7%	8.3%	13.4%	2.8
I trust the technology used by mobile money services providers to protect my privacy	20.0%	36.8%	30.9%	6.0%	6.3%	2.4
I think that the government is doing it's best to have policies and laws in place to address the rapid changing technology	22.0%	41.1%	17.4%	9.4%	10.0%	2.4
I think that the individuals who engage in online fraud and money laundering are caught and punished	14.3%	20.3%	39.7%	13.7%	12.0%	2.9
Average						**2.7**

Whereas on the one hand women expressed confidence rather than doubt and reservations in use of digital devices to transact (mean of 3.4 out of 5), they mostly agreed with the claim that the digital financial services systems are reliable & dependable to use (mean of 2.1 out of 5 points). Digital financial devices were viewed as relatively safe for women with most respondents disagreeing with having ever suffered physical loss (3.3 out of 5). This is a vote of confidence on reliability of DFS coupled with a low perception of risk exposure from utilization of related services. Nevertheless, women had low levels of trust with money services providers and feel that the government is not doing it's best to have policies and laws in place to address the rapid changing technology (2.4 out of 5). Respondents felt there was insufficient information to support knowledge of measures to secure online transactions (2.8 out of 5) whilst they were not satisfied with measures to counter fraud and money laundering (2.9 out of 5).

4.4.5 Perceived ease of use

Perceived ease of use of DFS assessed the levels of enjoyment and comfort with use of digital devices, tech savviness, perceptions on DFS training, infrastructure, cost of devices and preference for electronic financial services versus brick-and-mortar points of services. Overall, respondents

agreed with the statements posed to them (from survey data we calculated a weighted mean of 2.2 points out of a possible 5 points based on the Likert scale of 1 being 'strongly agree' and 5 being 'strongly disagree'). This would insinuate that women in Homa Bay County had a relatively high level of ease of use of digital financial services[2]. Table 4.7 has more details.

[2] A weighted average score of 2.2 out of a maximum possible of 5 points is equivalent to 44% agreement

Table 7:4 Perceived ease of use

Perceived ease of use	1=Strongly agree	2=Agree	3=Not sure	4=Disagree	5=Strongly disagree	Weighted Mean
I enjoy using digital devices	57.1%	33.7%	4.0%	1.1%	4.0%	1.6
I feel comfortable using digital financial services	49.7%	41.4%	6.0%	1.71%	1.1%	1.6
I am willing to learn more about digital financial services	53.4%	27.7%	10.9%	2.9%	5.1%	1.8
I feel threatened when others talk about digital technologies	20.3%	7.7%	23.1%	34.3%	14.6%	3.2
I think that training in digital financial services should be a mandatory requirement to opening an account	30.0%	28.9%	11.7%	21.4%	8.0%	2.5
I think that there is infrastructure necessary to operate digital financial device (e.g., access to internet and electrical power)	12.0%	31.4%	32.3%	15.1%	9.1%	2.8
I think that the cost of purchase of a digital financial device is reasonable (e.g., mobile phone, laptop, iPad)	18.0%	29.14%	27.7%	14.0%	10.9%	2.7
I think the language used by the digital financial services is easy to understand	20.3%	50.3%	17.1%	9.1%	3.1%	2.2
I prefer using digital financial service channels than walking to the bank or agent providers	54.6%	32.0%	7.1%	1.4%	4.9%	1.7
Average						**2.2**

It emerged that women were quite comfortable and enjoyed using digital devices (mean of 1.6 out of 5). They also preferred using digital financial service channels than walking to the bank or agent providers (average of 1.7) and were willing to learn more about digital financial services (average of 1.8). On the other hand, they never felt threatened when others talk about digital technologies (av.=3.2) while they did not find sufficient infrastructure necessary to operate digital financial device such as access to internet and electrical power (av. = 2.7). The cost of purchase of digital financial devices such as mobile phone, laptop and iPad was also found to be high and not reasonable (av. = 2.7).

4.5 Effects of digital financial literacy on access to and use of DFS by women

Objective one of this study sought to determine the effects of digital financial literacy on access to and use of Digital Financial Services by women in Homa Bay county, Kenya. The analytical framework used to compose digital financial literacy comprised three elements: Knowledge of DFS products & services, Attitudes and the Behaviour (KAB) of women users of these financial services. Elements used to measure access to and use of DFS include the cumulative period of use of DFS that can differentiate accounts that are more active from inactive ones, number of log-ins

per day and the nature of services used. Descriptive frequencies have already been presented in Section 4.4 of this report showing that, 77.4% of women had a cumulative of over 90 days use of DFS with an average of 4 daily log-ins and relying on DFS for receipts, payments and saving among over 90% of the women.

In this section, tests of mean differences and Pearson chi-square test of independence are done to assess the *Alternative Hypotheses* of any association between KAB elements of digital financial literacy (independent variable) and utilization of DFS by women (dependent variable). This is against the *Null Hypothesis* that there is no relationship or association between the two composite variables. Results below show there exist differences in access to and use of DFS by women in the study area due to variations in their digital financial literacy.

Table 8:4 Effect of KAB elements on Access to and use of DFS

Elements of Knowledge Attitudes and Behavior (KAB) tested for relationship/effect	Pearson Chi-square statistic ($\chi 2$) by dependent variable		
	Cumulative period of DFS usage	Number of daily log-ins	Type of DFS use
Understanding of basic use	14.14*	19.69	20.27*
Transacting with DFS	43.98*	46.89*	66.45*
Training on DFS	7.16	49.52*	6.09
Have passwords	31.56*	52.57*	25.34*
Shared passwords with people	6.21	10.82	9.79
Knowledge of antivirus	12.05*	43.34*	8.53
Experienced financial loss	4.28	22.85	6.34
Reads terms and conditions	9.05*	30.55*	21.76*
Asks for receipts	19.45*	64.51*	41.05*
Online support contact details	25.19*	29.48*	14.88*
Transacts through agents	6.82	13.06	16.07*
Training on consumer rights	1.75	39.43*	5.81

*Calculated statistic is significant at 0.05 or less indicating presence of a relationship

From the above results, digital financial literacy emerged as being influenced by experience of DFS usage, training, attitudes on safety and practices. Women with higher cumulative period of DFS use had a deeper knowledge of basic use of DFS products and features ($\chi 2=14.14$, $p<0.05$) and a higher number of DFS transactions (($\chi 2=43.98$, $p<0.05$) than women with little or no DFS usage experience. Looking at the results of chi-square statistics across other KAB framework

elements, women with higher cumulative period of DFS also sought online support contact details, enhanced security through use of passwords and read terms and conditions pertaining DFS utility than those with little or no DFS usage experience.

Women with higher average daily log-ins for DFS services had more training exposure on digital finance as well as consumer rights; they also sought customer support and evidence of payment receipts; they also had set passwords and were more security conscious than their counterparts who made less log-ins. Women whose main utilization of DFS was payments and online shopping were keener on security arrangements (use of passwords which they did not share), greater understanding of transacting with DFS platforms, read the details of terms and conditions and preferred working with agents more than their counterparts who used DFS for utilities like receipts.

4.6 Effects of socio-cultural norms on access to and use of DFS by women

Research objective two was to examine the effect of socio-cultural norms on the access to and use of Digital Financial Services by women in Homa Bay county, Kenya. Socio-cultural norms were measured by the help of the following indicators: (1) distance, mobility and time constraints; (2) resource allocation decisions; (3) lack of financial responsibility of the household; (4) lack of collateral to access funds for DFS and the influence of peers and relatives. A test of independence was conducted to evaluate whether the nature of DFS services accessed and utilized by Women in Homa Bay County differed by the above indicators resulting in Chi-square statistics. Overall, looking at the significance of calculated Chi-square statistics, socio-cultural norms did not establish a distinct effect on the nature of DFS services utilization apart from explaining number of daily logins. Specific results are presented in the Tables 4.9 to 4.11 showing that, whereas the number of daily logins for DFS was influenced by socio-cultural factors, the cumulative experience of DFS use and type of DFS service utilization were not influenced by socio-cultural factors.

Table 4.9: Social cultural factors against DFS services type utilized

		DFS services type utilized					
		Online	**Others**	**Payment**	**Receipt**	**Savings**	**Total**
Social	Distance, mobility & time constraints	1	3	53	68	21	149
Cultural	Resource allocation decisions	0	0	19	22	5	46
Factors	Financial responsibility of household	0	0	8	10	3	21
	Collateral to access funds for DFS	3	1	30	54	3	91
(χ2=28.95,	Influence of peers & relatives	0	0	9	9	3	21
p>0.05)							
Total		**4**	**4**	**119**	**163**	**35**	**328**

The calculated Chi-square statistic of 28.947 did not attain significance at 5% level of testing (95% confidence) meaning we cannot reject the *null hypothesis* claiming absence of a relationship between social cultural factors and DFS access/use. Therefore, any variation in DFS type of service utilization by women in the sample could not be linked or attributed to variations in the socio-cultural factors studied. In other words, we can conclude that any variation in DFS access and utilization by women happened independently of specific effects of social cultural influences like distance, mobility and time constraints; resource allocation decisions; lack of financial responsibility of the household; missing collateral to access funds for DFS and the influence of peers or relatives.

Table 10:4 Social cultural factors and number of daily logins crosstabulation

		Number of daily logins for DFS			
		Up to 3	4 to 10	Above 10	Total
Social Cultural	Distance, mobility & time constraints	84	63	2	149
Factors	Resource allocation decisions	22	20	4	46
(χ2=28.95,	Financial responsibility of household	14	7	0	21
p<0.05)	Collateral to access funds for DFS	44	47	0	91
	Influence of peers & relatives	13	8	0	21
Total		177	145	6	328

Results for the number of daily DFS related logins presented a calculated Chi-square statistic of 18.378 significant at 5% testing level. This means meaning we can reject the *null hypothesis* claiming absence of a relationship between social cultural factors and DFS logins. Therefore, part

of the variation in DFS access and utilization by women in the sample could be as a result of some socio-cultural factors. Indeed, whereas distance, mobility and time constraints was the key challenge affecting 47% of women making up to 3 logins and 43% of women making 4 to 10 logins respectively, resource allocation decision was the biggest influence 67% of women who made more than 10 daily logins. Moreover, lack of collateral to access funds was the leading influence for women who recorded 4 to 10 daily DFS logins.

Table 11:4 Social cultural factors and cumulative period of DFS use crosstabulation

		Cumulative period of DFS use				
		Up to 30 days	31-90 days	Over 90 days	Never	Total
Social cultural factors ($\chi 2=28.95$, $p>0.05$)	Distance, mobility & time constraints	12	26	105	6	149
	Resource allocation decisions	0	7	39	0	46
	Financial responsibility of household	1	3	17	0	21
	Collateral to access funds for DFS	6	10	74	1	91
	Influence of peers & relatives	1	1	19	0	21
Total		**20**	**47**	**254**	**7**	**328**

Results for the third measure of DFS use (cumulative period of DFS use) presented a calculated Chi-square statistic of 13.750 which failed to attain significant at 5% level of testing. This means we cannot reject the null hypothesis of absence of a relationship between social cultural factors and cumulative period of DFS use. Therefore, even though we find that distance, mobility and time constraints as well as collateral constraints were major challenges for DFS access and usage they did not differ according to cumulative experience of DFS use. Moreover, lack of resource allocation decisions, lack of financial responsibility of household and influences from peers and family were reported were reported as key challenges mostly within the cohort with heavily active accounts (women who had utilized DFS services for the longest - over 90 days).

4.7 Influence of perceived trust and risk on access to and use of DFS by women

Objective three was to assess the influence of perceived trust and risk on the access to and use of Digital Financial Services by women in Homa Bay county, Kenya. Perceived trust and risk were measured by respondent perception of doubts and reservations in DFs use, reliability of the systems, experiences of financial and physical loss, availability of information, technology

capability, perceptions of government support and fair rule of law to guard users of DFS against exposure to fraud and money laundering. Data was analyzed by weighting scores of levels of respondent agreement in a range of 1 to 5 whereby 1 implies they strongly agree while 5 shows that they strongly disagree. The weights were then used to investigate whether any variations in DFS use (logins, duration of use and type of service) were statistically important (significant) enough to indicate the presence of relationships attributable to perceived risk. Two analytical techniques employed with the first one testing strength of association (correlation coefficient) between perceived trust and DFS use. The second statistic (chi-square) derived from contingency tables cross-tabulating perceived trust and DFS use tested lack of independence between the two variables. Only relationships whose statistical parameters attained significance at 5% level of testing or lower are reported and show mixed relationships between perceived trust and risk against DFS use.

Correlation results (Table 4.12) indicate that a higher perception of doubt and reservation in the use of digital devices to transact was associated with lower DFS logins and vice versa (Correlation Coefficient, C.C.=0.1781, $p<0.05$). Perception that digital financial services systems are reliable and dependable correlated with higher DFS logins and vice versa (C.C.=0.1609, $p<0.05$). Also, higher perceptions that the government is doing its best to have policies and laws in place to address the rapid changing technology were highly correlated with higher DFS logins and vice versa (C.C.=0.1203, $p<0.05$).

Table 12:4 Correlation of number of DFS logins against perceived trust and risk

	Doubts & Reservation on use of DFS	DFS is reliable and dependable	Suffered financial loss	Suffered physical loss	Enough measures to secure online transactions	Trust of providers with data	Government is doing its best to have relevant policies and laws
Number of DFS logins (C.C.)	0.1781*	0.1609*	-0.0938	0.0069	0.0132	-0.0439	0.1203*
p-value	0.0008	0.0025	0.0796	0.8983	0.8060	0.4131	0.0244

*Statistical significance is attained at 5% level of testing or lower

Table 13:4 Weighted mean of perceptions of trust and risk against period of DFS use

		Cumulative period of DFS use				
		Up to 30 days	**31-90 days**	**Over 90 days**	**Never**	***χ2***
Perceptions of trust and risk *(Weighted levels of agreement on a scale of 1-5 where 1=Strongly agree, 5= strongly disagree)*	Doubts & Reservation on use of DFS	3.09	3.08	3.43	3.00	*39.85**
	DFS is reliable and dependable	1.91	1.79	2.15	2.00	*25.85**
	Suffered financial loss	2.86	3.02	2.56	2.33	*19.18*
	Suffered physical loss of device	3.77	2.98	3.30	2.33	*30.09**
	Belief that there is enough information to support measures to secure online transactions	2.73	2.79	2.87	2.67	*12.44*
	Trust of providers with data	2.41	2.21	2.46	2.11	*32.51**
	Belief that individuals who engage in online fraud and money laundering are caught and punished	2.91	2.77	2.93	2.33	*13.44*

* $\chi 2$ statistic is significant at 5% level of testing

On the key findings on perceptions of trust and risk against period of DFS use: Women who raised doubts and reservations on DFS had used DFS platforms for a shorter duration less than 30 days, or had never used it at all, while women who expressed confidence had used DFS for over 90 days ($\chi 2=39.85^*$, $p<0.05$). Women who perceived DFS to be reliable and dependable had used DFS platforms for shorter periods than those that perceived it otherwise ($\chi 2=25.85^*$, $p<0.05$). Women who had suffered financial loss had used DFS platforms for a longer period (over 90 days) which may mean that they have had longer period of exposure to DFS risks than their counterparts ($\chi 2=19.18$, $p>0.05$). But there is also a cohort that said they never used DFS who may have been discouraged by having experienced financial losses and forming a tech-phobia against digital devices from social norms (hearsay). Women had suffered physical losses of digital devices either had never used DFS platforms (perhaps for lack of adequate devices) or otherwise had used DFS for longer periods (which may mean they had longer risk exposure to physical losses. This finding was confirmed by a significant $\chi 2=30.09^*$, $p<0.05$.

There was no relationship between the availability of DFS security information among women and their duration of DFS usage indicating the likelihood of the market having a fairly symmetrical

distribution of security information regardless of periods of user duration of experience with digital financial services access/usage. Rather surprisingly, women with higher perception of trust with DFS service providers had either no experience or a shorter duration of DFS usage ($\chi2=32.51$*, $p<0.05$)[3]. Concerns about fraud and money laundering solutions were not linked to variations in duration of DFS usage among respondents in the sample pointing to parity of effect.

Table 14:4 Weighted mean of perceptions of trust and risk against nature of DFS

		Type of DFS service					
		Payment	**Receipt**	**Savings**	**OnlineS**	**Others**	***χ2***
Perceptions of trust and risk *(Weighted levels of agreement on a scale of 1-5 where 1=Strongly agree, 5= strongly disagree)*	Doubts & Reservation on use of DFS	3.40	3.27	3.53	3.80	3.00	*37.87*
	DFS is reliable and dependable	2.38	1.94	1.79	1.60	2.50	*50.48**
	Suffered financial loss	2.53	2.66	2.97	2.60	3.00	*32.20*
	Suffered physical loss of device	3.47	3.15	3.26	4.00	3.00	*78.53**
	Belief that there is enough information to support measures to secure online transactions	3.06	2.75	2.55	3.00	2.50	*42.00**
	Trust of providers with data	2.60	2.38	2.08	2.20	2.67	*49.04**
	Belief that individuals who engage in online fraud and money laundering are caught and punished	2.92	2.94	2.66	3.00	3.00	*42.77**

* $\chi2$ statistic is significant at 5% level of testing

Key findings on perceptions of trust and risk against type of DFS utilized were as follows: Women with perceptions of doubts and reservation on use of DFS used digital services for receiving money (inward transfers) or other purposes as opposed to making payments, saving and online shopping. However, this relationship is weak since the calculated Pearson $\chi2$ of 37.87 does not attain statistical significance at the set threshold for hypothesis rejection criteria because $p>0.05$. Perception that, DFS is reliable and dependable was higher among women who used DFS for saving and online shopping than payments ($\chi2 = 50.48$*, $p<0.05$). Further, women who had suffered physical loss of digital devices were more likely to utilize DSF only for receipts and other

[3] Check literature on inertia with digital finance service providers who can lock in users to their platform upon sign-up, addiction to DFS compared to hard cash.

reasons away from payment and shopping ($\chi 2 = 78.53^*$, $p<0.05$). Perceptions that there was enough information to support measures to secure online transactions were linked with higher utilization of DFS for saving and other purposes ($\chi 2 = 42.00^*$, $p<0.05$). Women who expressed trust of DFS providers with their personal transaction data transactions had higher utilization of DFS for online shopping than their counterparts ($\chi 2 = 49.04^*$, $p<0.05$). Finally, the belief in the market having strong anti-fraud and anti-money laundering schemes was associated with higher utilization of DFS for payment, receipt and saving ($\chi 2 = 42.77^*$, $p<0.05$).

4.8 Effect of perceived ease of use on access to and use of DFS by women

Research objective four sought to establish the effects of perceived ease of use on access to and use of Digital Financial Services by women in Homa Bay county, Kenya. Perceived ease of use was measured by a measure of levels of agreement with elements of DFS task familiarity, task accessibility and task application by users. Respondents were presented with statements that measured their perceptions and beliefs along a 5-point scale. Data was analyzed by weighting scores in a way that they fell in a range of 1 to 5 whereby 1 connotes they strongly agree and 5 that they strongly disagree. The weights were then used to investigate whether any variations in DFS use (logins, duration of use and type of service) were statistically important (significant) enough to indicate the presence of relationships or effects attributable to perceived ease of use.

Table 15:4 Weighted mean of ease of use against number of daily DFS logins

		No of daily logins for DFS use			
		Up to 3	**4-10**	**Over 10**	***χ2***
Perceived ease of use *(Weighted levels of agreement on a scale of 1-5 where 1=Strongly agree, 5= strongly disagree)*	I enjoy using digital devices	1.56	1.69	1.17	23.89*
	I feel comfortable using digital financial services	1.65	1.62	1.33	14.13
	I am willing to learn more about digital financial services	1.73	1.88	1.33	13.76
	I feel threatened when others talk about digital technologies	3.02	3.29	3.67	9.17
	Training in digital financial services should be a mandatory	2.37	2.67	1.50	18.51*
	There is infrastructure necessary to operate digital financial device	2.68	2.90	2.83	15.35*
	Cost of purchase of a digital financial device is reasonable	2.74	2.67	2.17	10.60
	Language used by the digital financial services is easy to understand	2.36	2.09	2.50	18.35*
	I prefer using DFS channels to walking to the bank	1.65	1.77	1.50	15.30*

* $\chi 2$ statistic is significant at 5% level of testing

Key takeaways from Table 4.15 are that women respondents with a higher number of daily logins enjoyed using digital devices more ($\chi 2 = 23.89^*$, $p<0.05$) and felt more comfortable using digital financial services ($\chi 2 = 23.89^*$, $p<0.05$) than those who used DFS less frequently. Respondents with a higher number of daily logins were more convinced that training in digital financial services should be a mandatory during sign-up ($\chi 2 = 18.51^*$, $p<0.05$) and that the industry had requisite infrastructure necessary to operate digital financial devices ($\chi 2 = 15.35^*$, $p<0.05$) compared to women who used DFS less frequently. As opposed to women who less frequently logged in for DFS, the more frequent users believed the language used by the digital financial services was easy to understand ($\chi 2 = 18.35^*$, $p<0.05$) and preferred using DFS channels to walking to the bank for transactions ($\chi 2 = 15.30^*$, $p<0.05$).

Table 16:4 Weighted mean of ease of use against number of daily DFS logins

		Cumulative period of DFS use				
		Up to 30 days	**31-90 days**	**Over 90 days**	**Never**	***χ2***
Perceived ease of use *(Weighted levels of agreement on a scale of 1-5 where 1=Strongly agree, 5= strongly disagree)*	I enjoy using digital devices	1.68	1.40	1.63	2.00	24.88*
	I feel comfortable using digital financial services	1.73	1.52	1.63	1.89	24.74*
	I am willing to learn more about digital financial services	1.86	1.79	1.76	2.44	16.01
	I feel threatened when others talk about digital technologies	2.64	3.04	3.20	3.44	18.28
	Training in digital financial services should be a mandatory	2.18	2.29	2.57	1.67	18.17
	There is infrastructure necessary to operate digital financial device	2.86	2.67	2.81	2.22	12.53
	Cost of purchase of a digital financial device is reasonable	2.55	2.48	2.77	2.00	16.59
	Language used by the digital financial services is easy to understand	2.32	2.13	2.27	2.11	5.44
	I prefer using DFS channels to walking to the bank	2.14	1.58	1.67	2.11	35.50*

* $\chi 2$ statistic is significant at 5% level of testing

From Table 4.16, women with a higher cumulative use of DFS enjoy using digital devices more ($\chi 2 = 24.88^*$, $p<0.05$), felt more comfortable using digital financial services ($\chi 2 = 24.74^*$, $p<0.05$) and preferred using DFS channels to walking to the bank ($\chi 2 = 35.50^*$, $p<0.05$) compared to their counterparts some who had never used digital financial services. Women with no experience of using DFS were less willing to learn ($\chi 2 = 16.01$, $p>0.05$), felt more threatened in presence of people who talked about digital technologies ($\chi 2 = 18.28^*$, $p>0.05$) and believed that the cost of purchase of a digital financial device is reasonable ($\chi 2 = 16.59^*$, $p<0.05$) than higher DFS users.

Table 17:4 Weighted mean of ease of use against number of daily DFS logins

		Type of DFS used					
		Payment	**Receipt**	**Savings**	**OnlineS**	**Others**	***χ2***
Perceived ease of use *(Weighted levels of agreement on a scale of 1-5 where 1=Strongly agree, 5= strongly disagree)*	I enjoy using digital devices	1.81	1.43	1.71	1.40	2.50	128.12*
	I feel comfortable using digital financial services	1.74	1.54	1.68	1.20	2.33	39.93*
	I am willing to learn more about digital financial services	1.99	1.60	1.79	1.40	3.17	73.45*
	I feel threatened when others talk about digital technologies	3.08	3.18	3.24	3.00	3.67	35.45
	Training in digital financial services should be a mandatory	2.57	2.47	2.42	2.80	2.00	48.84*
	There is infrastructure necessary to operate digital financial device	3.04	2.67	2.66	1.80	2.83	69.90*
	Cost of purchase of a digital financial device is reasonable	2.91	2.70	2.24	2.40	2.50	54.57*
	Language used by the digital financial services is easy to understand	2.25	2.31	2.11	1.40	2.67	37.51
	I prefer using DFS channels to walking to the bank	1.95	1.48	1.76	1.40	2.67	47.05*

* $\chi 2$ statistic is significant at 5% level of testing

Results of Table 4.17 show that, women who enjoyed using digital devices patronized transacting for receipts and online shopping than payments, savings and other DFS services ($\chi 2 = 128.12^*$, $p<0.05$). The same finding was established among women who found it easy to use digital financial services ($\chi 2 = 39.93.12^*$, $p<0.05$) and those more open to learn more about digital financial services ($\chi 2 = 73.45^*$, $p<0.05$). Women who believed there was adequate infrastructure necessary to operate digital financial device as well as those who found the cost of purchase of a digital financial device as reasonable utilized digital financial services more for online shopping and saving than payment and receipts ($\chi 2 = 69.90^*$, $p<0.05$ and $\chi 2 = 54.57^*$, $p<0.05$ respectively). Similarly, women who preferred using DFS channels to walking to the bank transacted DFS more for online shopping and receipts than other services ($\chi 2 = 47.05^*$, $p<0.05$).

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter outlines a discussion of findings of the study organized by study objectives, related conclusions arrived and recommendations including a suggestion of areas for further research. The discussions section contains an explanation of findings of the study with reference to available literature on each objective. Conclusion section presents the key implications of the study while recommendations suggest a number of measures which can be put in place to overcome challenges experienced by women around their financial decisions.

5.2 Discussion

It was established that women in the sample had a relatively high DFS financial literacy and access but have low DFS utilization due to factors such as lack adequate digital literacy, perceived trust and risk and perceived ease of use. High digital devise usage can be linked to a high rate of mobile connectivity in Kenya (Suri and Jack, 2016) and is also common with studies in developing countries (CGAP, 2023). The lower digital literacy is a result of insufficient or non-commensurate user education, say, on the benefits of formal DFS channels for women in Kenya. From India, Kumar et al (2021) has already stressed on the importance of financial literacy and spousal teamwork in intra-household financial decision-making.

Socio-cultural norms did not establish a distinct effect on the nature of DFS services utilization apart from explaining number of daily logins (one of the three measures used to mete DFS utilization). The biggest barriers of social cultural nature affecting access and use of digital financial services were lack of knowledge of DFS benefits thus leading to preference of informal channels for services such as savings. Mobility challenges and distance constraints while accessing DFS agents also negatively affected use of digital financial services. Other women lacked collateral to access funds in support of DFS activities as well as presence of gender discriminatory laws. This in contrast to Rwanda whose law was changed to allow ownership of property to be used as collateral (OECD, 2018).

Moreover, there were mixed relationships between perceived trust and risk against DFS use such that users with levels of perceived doubt and reservation in the use of digital devices to transact had lower DFS logins while those with confidence in use of digital devices had higher DFS logins (Correlation Coefficient, C.C.=0.1781, $p<0.05$). Women who raised doubts and reservations on DFS had used DFS platforms for a shorter duration less than 30 days, or had never used it at all, while women who expressed confidence had used DFS for over 90 days ($\chi2=39.85^*$, $p<0.05$). Also, perception that, DFS is reliable and dependable was higher among women who used DFS for saving and online shopping than payments ($\chi2 = 50.48^*$, $p<0.05$) consistent with Lama and Lamb (2017) who from China found financial literacy to be an important influence of Internet shopping.

On perceived trust and risk, women who believed that the government was doing its best to have policies and laws in place to address the rapid changing technology were higher DFS users and vice versa. Respondents that had suffered physical losses of digital devices either had never used DFS platforms (perhaps for lack of adequate devices) or otherwise had used DFS for longer periods (which may mean they had longer risk exposure to physical losses). Rather surprisingly, women with higher perception of trust with DFS service providers had either no experience or a shorter duration of DFS usage. This can be rationalized because some digital finance service providers lock in users to their platform upon sign-up; also, users develop addiction to DFS compared to hard cash. Perception of risk is critical due to actual risks emanating from existence of threats to privacy and security, fear of loss of critical information such as Personal Identification Numbers (PIN) and external threats such as hackers who work to gain access to persons' information and accounts (Ketterer & Andrade, 2016). It has also been established that threats to security and fraud makes women shy away from accessing and using digital financial services (Pearce, 2017). Other trust and risk issues include cyber-attacks, malware infestations, website hacking and fraudulent online activities such as phishing and money laundering which makes DFS users averse to becoming victims (Sarma & Pais, 2015).

Finally, perceived ease of use was associated positively with DFS usage: for instance, women respondents with a higher number of daily logins enjoyed using digital devices more ($\chi2 = 23.89^*$, $p<0.05$) and felt more comfortable using digital financial services ($\chi2 = 23.89^*$, $p<0.05$) than those

who used DFS less frequently. This finding is consistent with expectations from reality. Notably according to Gabor and Brooks (2017 some women tend to be less confident than men about their financial competences and skills due to the challenges that impact their ability to keep pace with men which would impact their capability for DFS use. From gender lenses, women have been found to tend to have less experience using DFS than men (Demirguc-Kunt et al, 2018 and Ledgerwood, 2023, September 14). They also tend to have less voice and agency which causes less confidence in using redress and complaint systems. CGAP's research in Cote d'Ivoire found that women are 10% less likely to contact a provider if there is a problem and 5% less knowledgeable on how to do this.

5.3 Conclusions

The study concludes as follows:

Women in Homa Bay County have a relatively high DFS access (in terms of digital device ownership) but have low DFS utilization due to factors such as lack adequate digital literacy, perceived trust and risk and perceived ease of use. High digital devise usage can be linked to a high rate of mobile connectivity in Kenya and is also common with studies in developing countries.

A higher duration of DFS usage leads to better understanding of DFS products and features including adoption of enhanced security arrangements among women.

Thirdly, socio-cultural norms do not distinctly affect DFS services utilization apart from explaining number of daily logins so that cumulative experience of DFS use and type of DFS service utilization are independent of socio-cultural factors like distance, mobility and time constraints; resource allocation decisions; lack of financial responsibility of the household; missing collateral to access funds for DFS and the influence of peers or relatives.

Also, perceived trust and risk are important influencers of DFS utilization. Access to and utilization of DFS leads to a higher level of perceived trust and risk on access to and use of DFS by women. Finally, more intense DFS utilization leads to an increase in perceived ease of use on of DFS by women. For example, women respondents with a higher number of daily logins enjoyed using digital devices more and felt more comfortable using digital financial services those who

used DFS less frequently. Women who enjoyed using digital devices patronized transacting for receipts and online shopping than payments, savings and other DFS services.

5.3 Recommendations

Currently the Government of Kenya and Mobile Number Operators (MNOs) are providing mobile phone users including women with DFS literacy and benefits. It is crucial to continue this program coupled with the need to combat the challenge of lack of collateral to access funds to support DFS activities which requires financial institutions to help formation of women groups that offer women friendly requirements to access financing services without the need for collateral.

Distance, mobility and time constraining DFS usage among women can be addressed by increasing the number of DFS agents whose responsibility falls under the helm of digital Financial Service Providers (FSPs). This is already happening in Kenya. However, it is imperative that cash-in cash-out service providers locate agency services in difficult to reach areas where women may be undertaking their day-to-day financial activities.

The government through the Ministry of Finance and Ministry of Internal Security is enhancing elements of perceived trust and risk with use of DFS by eliminating threats to privacy and security. Government together with FSPs should continue to educate DFS users against sharing Personal Identification Numbers (PIN) and passwords. Other risks such as cyber-attacks, malware infestations, website hacking and fraudulent online may be addressed through proper enforcement of consumer protection cyber laws in Kenya.

Government agencies and development partners such as UNDP, Gates Foundation and CGAP should consider creating digital financial literacy programs targeting female groups and female owned enterprises across the country. Partners can borrow models of training programs already implemented by commercial banks who have business clubs and seminars targeting female SMEs among their clients.

5.4 Recommendation for further research

Anchored on Unified Theory of Acceptance and Use of Technology (UTAUT) and Diffusion of Innovation (DoI) theories, this study aimed at highlighting the challenges experienced by women around their financial decisions and what fundamental societal norms cause these challenges. Future studies may consider investigating gender nuances among factors affecting DFS usage among enterprises using wider theoretical underpinnings such as the Theory of Reasoned Action (TRA) and improved Technology Acceptance Models (TAM).

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APPENDICES

APPENDIX 1 Letter of introduction

APPENDIX 2 Research questionnaire/interview guide

APPENDIX 3 Ethical Review Approval

APPENDIX 4 NACOSTI

APPENDICES

APPENDIX I: INTRODUCTION LETTER

Dear Participant,

RE: RESEARCH QUESTIONNAIRE

I am a graduate student at Strathmore University pursuing a Master's of Science in Development Finance (MDF) degree. I am currently undertaking academic research titled "The challenges of access to and use of digital financial services by women in Homa Bay County, Kenya." This is in partial fulfillment of the requirements of the MDF program at Strathmore University. I request your participation in the study by filling in this questionnaire.

The questionnaire contains five short sections that should take only a moment of your time. Please respond by ticking (□) in the appropriate box or filling in the blanks provided as accurately and as comprehensively as possible. Your participation is strictly confidential, and the findings used for academic purposes only.

Yours faithfully,

Emily Omego. Mobile Number: +254 722 869067

EMAIL: emilyomego@gmail.com

APPENDIX II: QUESTIONNAIRE

The challenges of access to and use of Digital Financial Services by women in Homa Bay County, Kenya

SECTION A: Demographic data

1. Please indicate your age bracket
   a) Below 18 years ( )
   b) 18 – 24 years ( )
   c) 24 – 60 years ( )
   d) 61 and above ( )

2. Which of the below best describes your current relationship status?
   a) Married ( )
   b) Widowed ( )
   c) Divorced ( )
   d) Separated ( )
   e) Unmarried ( )

3. Please indicate the highest level of education you have attained
   a) Primary level ( )
   b) Secondary level ( )
   c) College level ( )
   d) University level ( )

4. Please tick below your domicile constituency
   a) Homa Bay Town ( )
   b) Kabondo Kasipul ( )
   c) Karachuonyo ( )
   d) Kasipul ( )
   e) Mbita ( )
   f) Ndhiwa ( )
   g) Rangwe ( )
   h) Suba ( )
   i) Oyugis ( )

5. What is your current source of income?
   a. Employment
   b. Business
   c. Others

6. Which income group comprises your monthly income?
   a) Less than Kshs 23,670 ( )
   b) Between Kshs 23,671 and 119,999 ( )
   c) More than Kshs 120,000. ( )

SECTION A: Access to and use of Digital Financial Services

In this questionnaire, please tick against the answer that closely represents your view.

No. Statement

1. Please check which of the following registered digital finance service account you have used.

   □ M-Pesa, □ Airtel Money, □ Orange Money, □ Essar yuCash.,) □ None.

   List the Others used _____

2. Please indicate the cumulative duration of your digital finance services use.

   □ Less than 30 days □ Between 31 to 90 days □ More than 90 days □ Never

   List reasons for non-use _____

3. If you are to estimate the number of times you have logged into your registered digital finance service account in a day (Pareto chart). _____

4. Which of the below services do you frequently use the digital finance for?

   □ Payment of bills □ Receipt of money □ Online shopping □ Savings □ Others

   List the Others used _____

5. Have you ever lost any of your digital devices like mobile phone, laptop, iPad through theft?

   □ Yes □ No □ Others

   List the Other ways they were lost _____

6. How likely would you recommend the use of digital financial services to your friends?

   □ Very likely □ Very unlikely □ Other

   List of your reasons _____

SECTION B: Digital Financial Literacy

Please respond to each of the following questions by putting a tick (√) in the box at the appropriate spot: 'Yes' or 'No'

Knowledge of DFS products and services	**Yes**	**No**
1. Do you own digital devices like phones, tablets, laptops, watches		
2. Do you understand the basic use functions of the smart devices		
3. Do you operate any digital finance services account like M-pesa, Airtel money		
4. Do you use your device to carry out online transactions like payment, savings		
5. Have you attended any trainings or seminars on digital financial literacy		
Behavior on awareness of DFS risks and risk control measures		
1. Do you use passwords to protect your digital devices		
2. Do you use the same password across multiple user accounts		
3. Do you share your passwords with other people		
4. Do you know of what antivirus refers to		
5. Have you ever suffered financial loss while using digital financial services		
Attitude/Knowledge of consumer rights, redress, and support		
1. Do you read the terms and conditions stated on digital services before use		
2. Do you ask and check for receipts and statements of online transactions		
3. Do you know of any support contact details to call when in need		
4. Do you transact through agents or by self		
5. Have you attended any trainings or seminar on consumer rights and protection		

If you have any comments you would like to make regarding digital financial literacy, please write them below

SECTION C: Social Cultural Challenges

What do you think are the social cultural factors affecting the access and use of digital financial services by women? Please tick (√) all that apply

Lack of time due to household activities	
Lack of resource allocation decisions for the household	
Lack of financial responsibility for the household	
Lack of collateral to access funds to support DFS activities	
Lack of freedom and being monitored by spouse	
Lack of access to information & only limited to friends & family with DFS information	
Lack of values and background within family members to inform knowledge of DFS	
Lack of community support, instead social stigma &cultural taboos associated with DFS	
Lack of Identification documents required to open a DFS account	
Lack of knowledge of the benefits of DFS and hence preference of informal savings	
Lack of mobility plus distance constraints to access DFS agents	
Lack of laws supporting women use of DFS instead discriminatory laws & regulations	
Lack of social capital like supportive parents instead I am discouraged by parents	
Others (Please specify)	

SECTION D: Perceived trust and risk

Please indicate the extent to which you agree or disagree with the following statements by putting a tick (√) in the box at the appropriate spot

Key: 1=Strongly agree; 2=Agree; 3=Not sure; 4=Disagree; 5=Strongly disagree.

No.	Statement	1	2	3	4	5
1.	I have doubts and reservations in the use of digital devices to transact					
2.	I think the digital financial services systems are reliable & dependable to use					
3.	I have ever suffered financial loss while using the digital financial services					
4.	I have ever suffered physical loss of my digital financial device					
5.	I think that there is enough information to support knowledge of measures to secure online transactions					
6.	I trust the technology used by mobile money services providers to protect my privacy					
7.	I think that the government is doing it's best to have policies and laws in place to address the rapid changing technology					

8	I think that the individuals who engage in online fraud and money laundering are caught and punished					

SECTION E: Perceived ease of use

Please indicate the extent to which you agree or disagree with the following statements by putting a tick (√) in the box at the appropriate spot

No.	**Statement**	**1**	**2**	**3**	**4**	**5**
1.	I enjoy using digital devices					
2.	I feel comfortable using digital financial services					
3.	I am willing to learn more about digital financial services					
4.	I feel threatened when others talk about digital technologies					
5.	I think that training in digital financial services should be a mandatory requirement to opening an account					
6.	I think that there is infrastructure necessary to operate digital financial device (e.g., access to internet and electrical power)					
7.	I think that the cost of purchase of a digital financial device is reasonable (e.g., mobile phone, laptop, iPad)					
8	I think the language used by the digital financial services is easy to understand					
9	I prefer using digital financial service channels than walking to the bank or agent providers					

If you have any other comments you would like to make regarding access and use of digital financial services, please write below

THANK YOU

APPENDIX III: ETHICAL REVIEW APPROVAL

Strathmore UNIVERSITY

23rd February 2023

Mrs Omego Emily Akinyi,
emily.omego@strathmore.edu

Dear Mrs Omego,

RE: The Challenges of Access to and Use of Digital Financial Services by Women in Homa Bay County, Kenya

This is to inform you that SU-ISERC has reviewed and **approved** your above SU- **master's** research proposal. Your application reference number is **SU-ISERC1580/23.** The approval period is from **23rd February 2023 to 22nd February 2024.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, and MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-ISERC.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-ISERC within 48 hours of notification
iv. Any changes, anticipated or otherwise, that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-ISERC within 48 hours
v. Clearance for the export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to the expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days of completion of the study to SU-ISERC.

Before commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) https://research-portal.nacosti.go.ke/ and obtain other clearances needed.

Yours sincerely,

for: **Dr Ben Ngoye,**
Secretary; SU-ISERC

Cc: Mr Ambrose Rachier,
Chairperson; SU-ISERC

Ole Sangale Rd, Madaraka Estate. PO Box 59857-00200, Nairobi, Kenya. Tel +254 (0)703 034000
Email admissions@strathmore.edu www.strathmore.edu

APPENDIX IV: NACOSTI

Off Strathmore Rd, Madaraka Estate,
P.O Box 59857-00200, Nairobi, Kenya.
Cell: +254 703 034 612, Telephone: 3034612Kenya
Email: info@sbs.strathmore.edu, www.sbs.strathmore.edu

Strathmore UNIVERSITY
BUSINESS SCHOOL

8th March 2023.

Director General,
National Commission for Science Technology and Innovation,
P. O. Box 30623, 00100
Nairobi.

Dear Sir,

RE: FACILITATION OF RESEARCH – EMILY OMEGO

This is to introduce Emily Omego who is a Master of Science in Development Finance (MDF) Student at Strathmore University Business School, admission number MDF/113316/18. As part of our MDF Program, Emily is expected to do applied research and undertake a project. This is in partial fulfilment of the requirements of the MDF course.

Emily is undertaking a research paper on " **The Challenges of Access to and Use of Digital Financial Services by Women in Homa Bay County, Kenya."** The information obtained shall be treated confidentially and shall be used for academic purposes only.

Our MDF seeks to establish links with industry, and one of these ways is by directing our research to areas that would be of direct use to industry. We would be glad to share our findings with you after the research.

We appreciate your support and shall be willing to provide any further information if required.

Yours sincerely,

Njoki Kiagiri.
Manager - Graduate Programmes.

AABS EFMD AACSB

APPENDIX V: NACOSTI