COMPUTER SCIENCE CAPSTONE

Capstone Title: “E-commerce implementation challenges in Tanzania”

Authors Full Names: Wenseslaus Raphael Mwita

Course: Computer Science

Faculty: African Leadership University, Kigali, Rwanda

Year of Graduation: 2022

Declaration

I certify that the work presented in this capstone is my own and that any work that has been performed by others is appropriately cited.

Name: Wenseslaus Raphael Mwita

Student Number: 449387200

Signature: 

Date: 22/04/2022

Approval (Supervisor)

This is to acknowledge that this capstone project has been submitted with my approval.

Name: Thadee Gatera

Signature:

Date: 22/04/2022

Acknowledgement

Throughout the writing of this capstone I have received great support and assistance. I would first like to thank my supervisor, Thadee Gatera, whose expertise was invaluable in the formulating of the research topic, methodology, and solution implementation in particular.

I would like to acknowledge all the panel judges during the capstone defence for their incredible feedback that has made me look into this project from a different perspective.

More importantly, I would like to acknowledge my fellow classmates for challenging me and pushing me to be the best version of myself.

Abstract

E-commerce retail business around the world has topped $4.28 trillion in 2020, which accounts for a 27.6% increase from the previous year[1]. Meanwhile, e-commerce startup businesses have failed significantly to establish their presence in Tanzania, leading to enormous loss and death of startup businesses in their early phase with zero returns, George Oreku [2]. Tanzania is left behind in exploring the opportunity and value that e-commerce offers. Consequently, it leads to business closure, low revenue due to less online market opportunity, and inferior goods and service rotation due to less import and export of goods to the international market. This research aims to highlight why e-commerce businesses fail in Tanzania, ways to overcome them and create a scalable solution that will help solve this problem. Browsing through Tanzania is believed to have the capacity to host e-commerce platforms. However, there are still several challenges that need to be addressed example, payment, government policy, and trust, just to mention a few. Most people today use social media as a means for them to start investing in e-commerce, but the process still goes back to the traditional methods of buying and selling goods and services. Some of the solutions that will help solve this problem are building a social e-commerce platform that leverages trust as the key breaking factor, onboarding SMEs in a fast and easy way, leasing with the government on tax and purchasing policy, and the use of mobile money instead of bank cards. This will require an entire software development team with all the software development resources example, the internet, laptops, servers, and other related resources.

Keywords: E-commerce, Social Media, Software Development, Internet Access, Card Payment

Table of Contents

List of Tables

List of Figures

Chapter 1: Project Introduction

1.1. Introduction, Background, and Motivation

1.2. Problem Definition

1.3 Hypothesis

1.4 Project main Objective

1.5 List of Specific Objectives

1.6 Project Scope

1.7 Technical Requirements

1.8 Project Timeline (Gantt Chart)

1.9 Project Budget

Chapter 2: Literature Review

2.1 Introduction

2.2 Literature giving a general overview of the situation

2.3 Literature review related to problem statement

2.4 Review literature related to hypothesis

2.5 The importance of the research against literature review

2.6 Review literature related to technologies

Chapter 3: System Analysis and Design

3.1 Introduction

3.2 Data Analysis and Presentation

3.3 Interpretation of findings/results

3.4 Summary

3.5 Description of existing sytem

3.6 Description of new system

3.7 Illustration of new system

3.7.1 Data Flow Diagram

3.7.2 Use Case

3.7.3 Normalization

3.7.4 Data Dictionary

3.7.5 Entity Relationship Diagram

3.8 Architecture design of the new system

Chapter 4: The Software Development Model

4.1 Implementation and Coding

4.1.1 Introduction

4.1.2 Description of implementation tools and technology

4.1.3 Screenshots and Source Codes

4.2 Testing

4.2.1 Introduction

4.2.2 The objective of Testing

4.2.3 Unit Testing outputs

4.2.4 Validation Testing Outputs

4.2.5 Integration Testing Outputs

4.2.6 Functional System testing Results

4.2.7 Acceptance Testing Report

Chapter 5: The Description of the Application

Chapter 6: Conclusion & Recommendations

6. Introduction

6.1 Conclusions

6.2 Areas of further research

6.3 Recommendations for improvement for the study

List of Tables

1. Schedule
2. Budget

Chapter 1: Project Introduction

Implementation of e-commerce in Tanzania has been a very slow process, making different authors research this specific topic to understand the challenges people go through when implementing an e-commerce business. [Simpson M. & Docherty A., 2004]. A number of recent studies have shown that the main challenges for e-commerce adoption in Tanzania are lack of infrastructure, skilled staff, low card payment penetration, low income, and low computer usage (George S. et al., 2013). Despite the large number, studies have shown that the use of Information and Communication Technology (ICT) is still very low in Tanzania in comparison to other places, but it seems to be growing at a steady speed (Enrico C. et al. 2011). Tanzania Communications Regulatory Authority's research (TCRA) depicted that the use and spread of the internet have increased at a rate of 4% compared to neighbouring countries (George S. et al 2013).

Table 1. Summary of percentage of ICT usage in Tanzania [SourceTCRA]

Media	All sample	Urban	Rural
Radio	85%	85%	84%
TV	27%	59%	14%
Computer	3%	8%	1%
Internet	4%	8%	2%
Mobile phone	62%	82%	54%

Source: (George S. et al 2013)

For organisations to adapt to e-commerce, they need a computer and a stable internet connection. Something to note here is that the majority of computers are owned by private companies rather than the government said, George.

This review will focus on research conducted by three different sources from 2011 - 2021 to expand the idea of internet accessibility as the driving factor and a short analysis of ways forward together with a deep understanding of the challenges.

Ecommerce is the process of hosting or kickstarting business transactions over the internet while exchanging information, money, services, and goods via electronic devices (Fraser J., Fraser N. & McDonald F., 2000). The transaction needs to happen over the internet protocol. This process is widespread in developed countries where friendly access to electronic devices, the internet, policies, and other requirements. Ever since the introduction of the

internet, a lot has changed, specifically how we do business. People had to leave their homes and travel miles to meet their sellers and buyers in the past. But today, we live in a world where the exchange of goods and services can happen without any of these two bodies meeting each other, and that's what we call e-commerce.

1.1 Introduction, Background and Motivation

Tanzania had a population of 59 million people in 2020 with an area of 945,087 sq km ("Population, total - Tanzania | Data", 2021). Dar-es-salaam is the largest business city and will host about 7 million people in 2020 ("Tanzania | Culture, Religion, Population, Language, & People", 2021).

E-commerce is a way for both buyers and sellers to do business over the internet without having to physically meet. This can either be via a phone or a laptop with access to the internet. Similar research was conducted by George S. Oreku in 2013. George highlighted the main reason for the failure of e-commerce is due to the accessibility of the internet, illiteracy, government policy, inaccurate addresses, and bank policies. It's 2021 now and some of these challenges might have been solved. The number of internet users has increased drastically to about 29 million by March 2021. ("Tanzania Internet Penetration Reach 50% in March 2021, Data Traffic Up by 25% - TanzaniaInvest", 2021)

This shouldn't ignore the research was done that demonstrates the use of electronic equipment in the e-commerce industry is still very low but it's growing quite steadily, by Materu and Diyamett.

1.2 Problem Statement and Hypothesis

The implementation of e-commerce retail business around the world has topped $4.28 trillion in 2020, which accounts for a 27.6% increase of the previous year[4]. This includes different types of businesses like the food industry, transportation, and the selling of goods or other services.

Despite that e-commerce, startup businesses have failed significantly to establish their presence in Tanzania which has led to enormous loss and death of startup businesses in their early phase with zero returns, George Oreku [5]. This has been experienced by companies like Jumia and other companies closing its business.

As an effect, it leads to business closure, low revenue due to less online market opportunity, and poor goods and service rotation due to less import and export of goods to the international market.

1.2 Research Aim

The aim of the research is to help startup businesses understand the challenges of implementing e-commerce business in Tanzania, provide them with different techniques on how to overcome those challenges, and create a scalable innovative solution to be used by different startup owners from all the learnings.

In addition to that, I hope that my findings will change how individuals and companies practice e-commerce in Tanzania and result in fewer business failures. This will also mean creating a scalable solution that can easily be adapted and used by anyone that needs to start an e-commerce business.

Not only that but also convince the government and other stakeholders like banks to reduce the restrictions so that people adapt to the system in an easy and fast way through the opportunities created by the emerging e-commerce sector.

1.3 Research Questions/Hypothesis

Some of the research questions that I aim to answer are like:

1. Why do small and medium-sized enterprises (SMEs) in Tanzania fail to implement e-commerce in their business in the early phase?
2. How can SME overcome these challenges when implementing e-commerce in their business more effectively?
3. What are the tips and tricks of adapting to the new e-commerce solutions?

1.4 Project Main Objectives

1. Identify the challenges in implementing e-commerce.
2. Challenge faced by the buyers of e-commerce products.
3. How to overcome those challenges and different tips and tricks
4. Explore the opportunities that come with this solution.
5. A scalable solution that can be adopted by anyone in the e-commerce industry.

1.5 Project Scope

Address any potential obstacles, limitations, and ethical or practical issues. How will you plan for and deal with problems?

The main limitation of this research is data collection. Tanzania Communications Regulatory Authority requires people doing research in the technology industry to request a permit. As I'm currently located in Rwanda I'm not able to submit that request which has affected the sample size for my research.

I plan to overcome this limitation by selecting a smaller sample size of about 15 people mainly those I know. I also plan to do broader research when I go back that will cover a much larger sample size so that my data is more accurate and my research is more relevant to the community that am writing to.

Chapter 2: Literature review

The literature review summarizes, compares, and critiques the most relevant scholarly sources on the topic. There are many different ways to structure a literature review, but it should explore:

- *Key Concepts, Theories, and Studies*: Compare, contrast, and establish the theories and concepts that will be most important for your project.
- Key Debates and Controversies: Identify points of conflict and situate your own position.
- Gaps in Existing Knowledge: Show what is missing and how your project will fit in.

2.1 Introduction

- Define your topic and provide an appropriate context for reviewing the literature;
- Establish your reasons for the study;
- Cite the literature that talks about similar topics

E-commerce is the process of hosting or kickstarting business transactions over the internet while exchanging information, money, services, and goods via electronic devices (Fraser J., Fraser N. & McDonald F., 2000). The transaction needs to happen over the internet protocol. This process is very common in developed countries where access to electronic devices, the internet, policies and other requirements are friendly. Ever since the introduction of the internet, a lot has changed and specifically how we do business. In the past, people had to leave their homes and travel miles to meet their sellers and buyers. But today we live in a world where the exchange of goods and services can happen without any of these two bodies meeting each other and that's what we call e-commerce.

Tanzania had a population of 59 million people in 2020 with an area of 945,087 sq km ("Population, total - Tanzania | Data", 2021). Dar-es-salaam is the largest businesses city and a host to about 7 million people in 2020 ("Tanzania | Culture, Religion, Population, Language, & People", 2021).

2.2 Literature giving a general overview of the situation (context literature)

Implementation of e-commerce in Tanzania has been a very slow process which made different authors research this specific topic to understand the challenges that people go through when implementing an e-commerce business. [Simpson M. & Docherty A., 2004]. A number of recent studies have shown that the main challenges for e-commerce adoption in Tanzania are lack of infrastructure, skilled staff, low card payment penetration, low income, and low computer usage (George S. et al 2013). Despite the large number, studies have shown that the use of Information and Communication Technology (ICT) is still very low in Tanzania in comparison to other places but it seems to be growing at a steady speed (Enrico C. et al 2011). The research was done by Tanzania Communications Regulatory Authority (TCRA) depicted that the use and spread of the internet have increased at a rate of 4% compared to neighbouring countries (George S. et al 2013).

Table 1. Summary of percentage of ICT usage in Tanzania [SourceTCRA]

Media	All sample	Urban	Rural
Radio	85%	85%	84%
TV	27%	59%	14%
Computer	3%	8%	1%
Internet	4%	8%	2%
Mobile phone	62%	82%	54%

Source: (George S. et al 2013)

For organizations to adapt to e-commerce they need a computer and a stable internet connection. Something to note here is that the majority of computers are owned by private companies rather than the government said, George.

This review will focus on research conducted by three different sources from 2011 - 2021 to expand the idea of internet accessibility as the driving factor and a short analysis of ways forward together with a deep understanding of the challenges.

2.3 Literature review related to your problem statement

Evans grouped these challenges into economic, social, legal, and technical challenges. He went further and highlights economic challenges including resources, cost of maintenance, acquisition and type of product as the main challenges. Some of the social challenges can cut across behaviour, management, perception of technology, and security. In the technical part, the research highlighted internet availability, infrastructure, and troubleshooting support (Evans. M, 2020). Business owners are the most important stakeholders in the implementation of e-commerce. In Tanzania, alone small businesses owners contribute to about 70% of the national GDP, 80% of employment and 80% of goods (Asiimwe, 2017). In addition to that, some other technical factors related to this include internet security, the spread of internet connectivity, legal, and regulatory bodies.

To anchor internet connectivity, George S. argues that the Tanzania Communications Regulatory Authority (TCRA) depicted that the use and spread of the internet have increased at a rate of 4% compared to neighbouring countries (George S. et al 2013). Generally, this is to say the growth rate is significantly smaller than in other countries where e-commerce is doing very well. “Kenya's mobile penetration grew 11% between January 2020 and January 2021”, ("Kenya Internet usage lags mobile penetration - Connecting Africa", 2021).

On the other hand, the buyers also have to inhibit factors that are not the same as the sellers. This includes security, lack of privacy, information scarcity, computer illiteracy, and poor policies (George S. et al 2013). Once the buyer feels comfortable with the tool to use to buy products online then this changes the behaviour and reduces the overall depth of this problem. This might change time as people become more exposed to technology so they become aware of different ways for them to navigate the internet.

An analysis done by Evans Mlay mentioned that most of the respondents for his research agreed that challenges in accessing the internet are the main obstacle for e-commerce businesses. “The analysis further reveals that 36 (60.0%) of respondents strongly agree on this, 40 (40.0%) just agree, 8% of the respondents were indifferent. In addition, 16 (16.0%) disagree on this as shown in Table 4.4 above.”, (Mlay. E, 2020).

Lyata went further to explain that most sellers are familiar with technology like emails but the internet remains as the secondary tool for showing products and services rather than as an e-commerce platform (Ndyali, 2013). This means the community is slowly starting to adapt and get familiar with technology which makes its adoption to e-commerce a sloping curve.

2.4 Review literature related to your objectives/hypothesis and technologies

Overall different researchers have tried to expand on internet use and knowledge as one of the key hindrances to e-commerce adoption. I generally agree with all the three authors that have highlighted that. Though I think the authors need to expand more and do a better job in looking at statistics and data from recent years. Some of these challenges are outdated and the internet has taken so much space in the Tanzania space. That is to say, it's worth exploring what has changed to allow for easy and quicker adoption of e-commerce in Tanzania. It's important to acknowledge and also think about other challenges that hinder the adoption of e-commerce in Tanzania example, policy, internet security, availability of staff experts, technology illiterate, and ease of payment methods. E-commerce is an added method for businesses to reach their customers so that they can generate more revenue. It's important to always look at this sector as an opportunity and not a challenge so that we can generate solutions and not blame.

Chapter 3: System Analysis and Design

3.1 Introduction

System analysis is the process of studying different business procedures and creating new ones that will archive and solve the goals. This happens in several ways for example exploring the data, data visualization, looking at existing systems, ideation, and finally coming up with new ones. Below is a study of how e-commerce in Tanzania has been implemented, outlining different findings, and solutions to move forward.

3.2 Data Analysis and Presentation

This required me to collect data from users of e-commerce platforms from Tanzania from the age of 18 to 35 to understand how their usage of e-commerce platforms, the challenges they face, and how this can be made better for them. Another set of users that I collected data from is the MSE owners from Tanzania from the age of 18 to 35 who sell things on different platforms. The aim of the research was to understand the cause and effect relationship between what affects the buyers and sellers of items on different e-commerce platforms. Both qualitative and quantitative data was collected from both sets of audiences and was used to deeply study the research question. To make this possible, primary data was collected from the participants through online questionnaires.

3.3 Research Methodology:

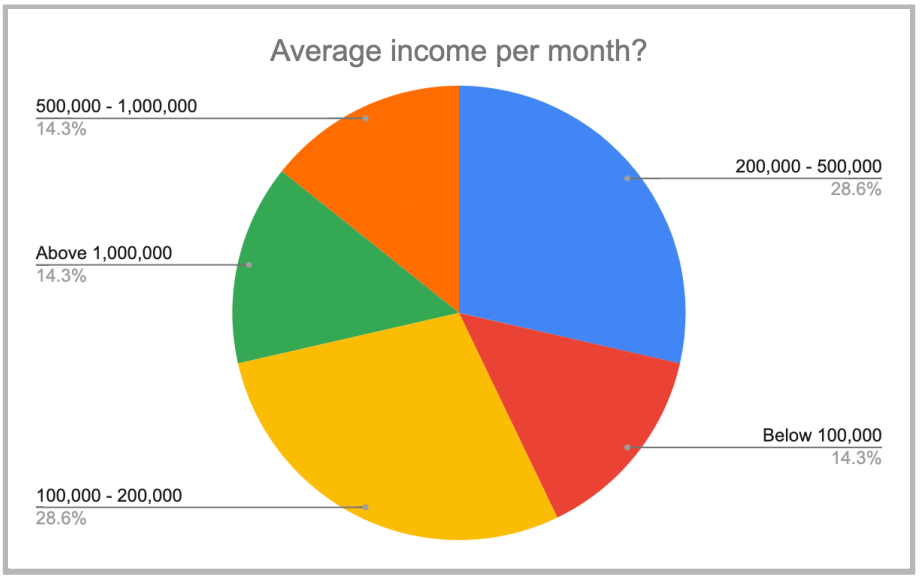
After realizing the type of data needed (qualitative and quantitative) as mentioned above, went further into designing an online questionnaire with different types of questions that I needed answers to. Since there are two sets of users in mind I designed two different types of questionnaires. The first questionnaire was for the buyers of online goods and services whereas the second questionnaire was for the sellers of those goods and services. The first questionnaire had 10 questions which had 3 open-ended questions, 5 multiple choices and 2 closed-ended questions. The second questionnaire was specifically designed for the entrepreneurs and it had 2 closed-ended questions, 2 open-ended and 6 multiple-choice questions. The method used was google forms that were sent out to participants through mobile phone messages.

The survey was conducted online and sent over mobile phones to participants from the age of 18 to 35 living in Tanzania. The aim was to get 100 respondents from the goods buyers and 50 from the sellers. The timeframe for this research was 3 days (from November 29th to December 1st). This goal was reached through my data collection process and the survey analysis will be shared in these documents.

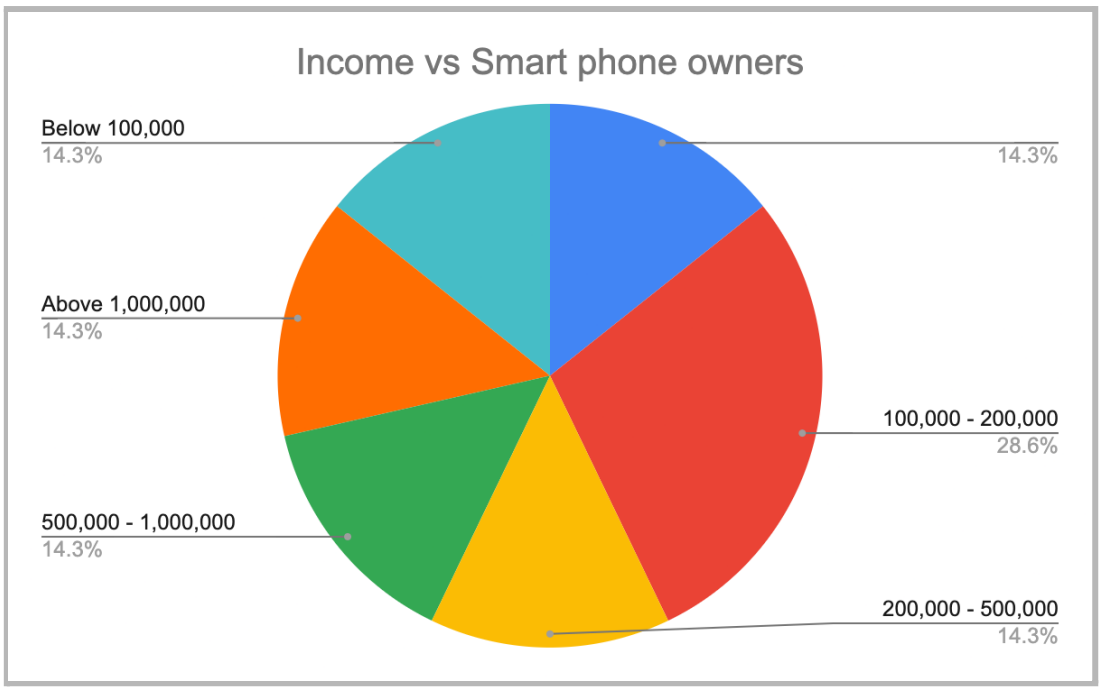
3.4 Interpretation and Results

Though the data was collected from two different groups, it was analysed in a way that will combine the two responses together in order to be able to answer the research question. The data collected required cleaning, transformation, and processing to make it useful for the insights. I used pivot tables to analyze quantitative data and used a manual process to analyze the qualitative data.

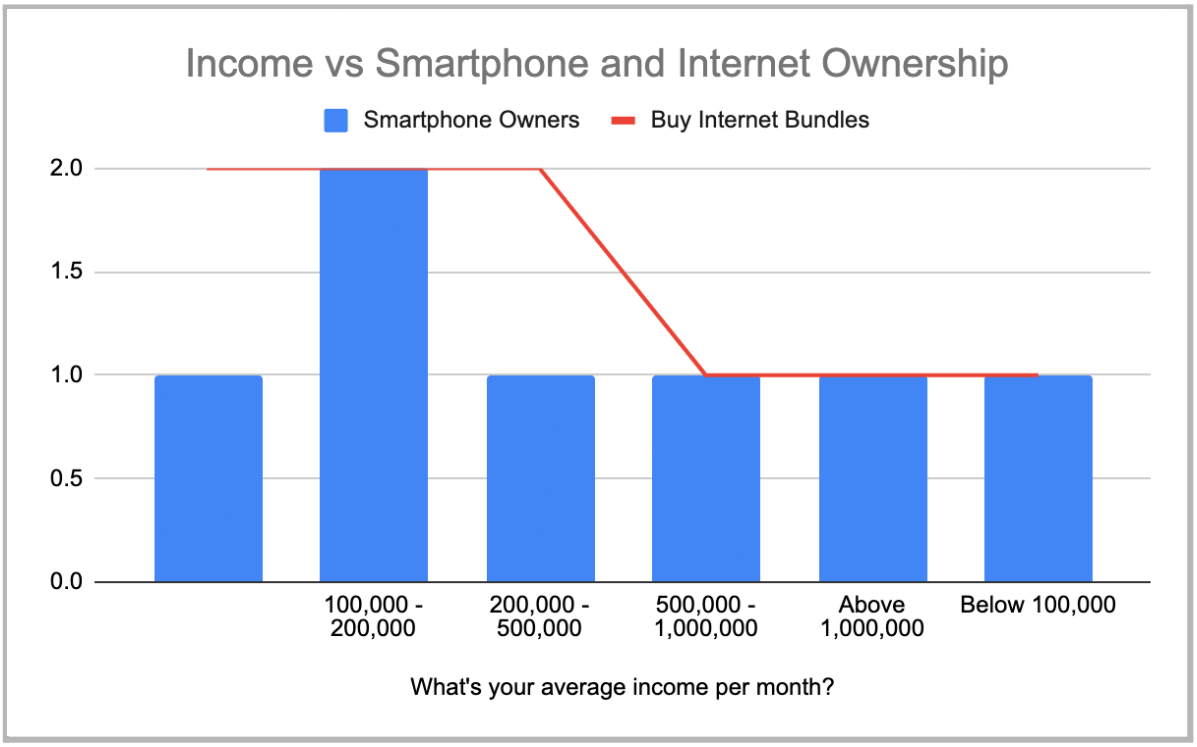
Here are some of the graphs and visualizations from the analysis



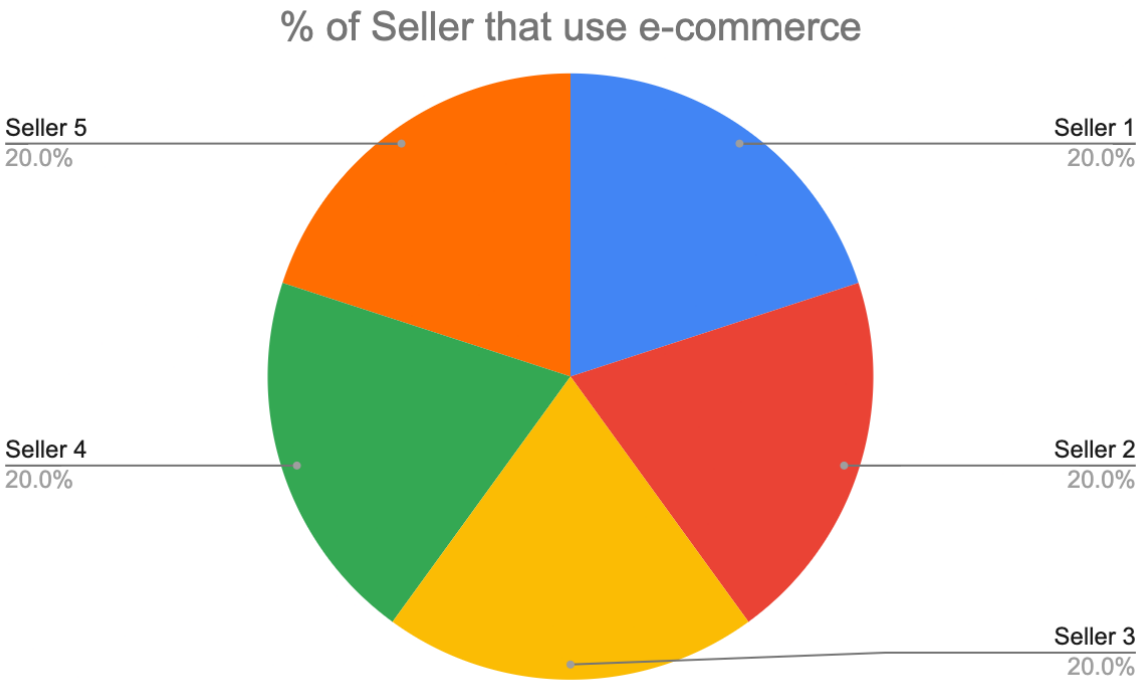
Average Income per Month



Most people that have a monthly income own smartphones



Most people that have a monthly income they do own smartphones have internet access



Percentage of sellers using online platforms to sell their products

3.4 Other Manual Analysis for Buyers was;

All sellers and buyers use social media platforms to sell and buy products

40% of the buyers prefer in-person shopping due to a lack of trust.

Reasons to not shop online are like

- Delivery is a problem even when I order - 20%
- I don't have a valid online payment method - 10%

- I like e-commerce but don’t use it - 14%
- I do not trust e-commerce - 56%

Manual Analysis For sellers

Reasons for not using e-commerce platforms are

- I don't have a valid online payment method - 100%
- Platforms used by sellers
- Instagram - 55%
- Whatsapp - 45%

3.4 Summary

As explained above some of the major analysis highlights shows that trust on online platforms is the major problem to why buyers and sellers don’t use online platforms. 80% of the sellers depend on people in their contact list to buy items so this forces them to use platforms like WhatsApp and Instagram for selling items. Now I can tell from the literature review that some of the challenges highlighted might not be challenges anymore since society has been developing over time and it’s time to try another solution with a different approach to the e-commerce market.

The final solution I was able to come up with is a social shopping application that heavily leverages trust between buyers and sellers. It solves the problem of trust while also integrating an easy mobile money payment solution. Hope this is a scalable solution for anyone to use.

3.5 Description of existing system

Here are some of the existing systems that people use

- Instagram - 55%
- Whatsapp - 45%

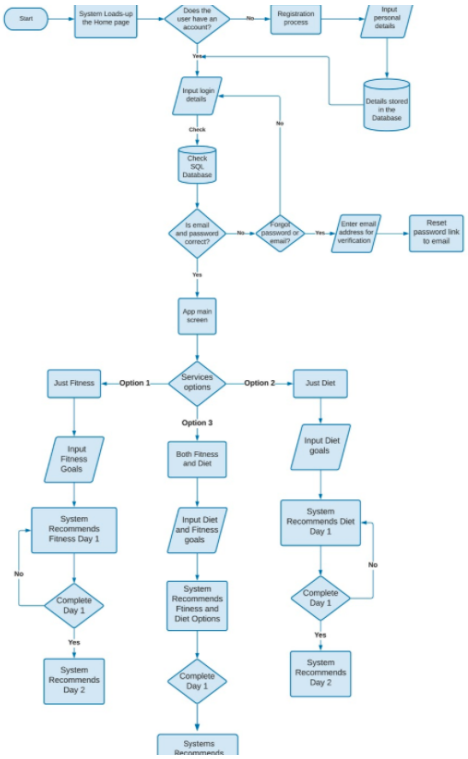
Some of the challenges with these existing systems are, not native to buying and selling, they don't manage stock, lack incentives to the buys, and they are not built on trust.

3.6 Describing the New System

The new solution is to include buying in the Tanzanian market where users are able to buy products based on the people they know and follow with a mix of e-commerce and later social features on one platform. This solution seems to be working to some extent due to the majority of people using social media to sell and buy but it's missing a full e-commerce aspect of it.

3.7 New System Illustration

3.7.1 Data Flow Diagram



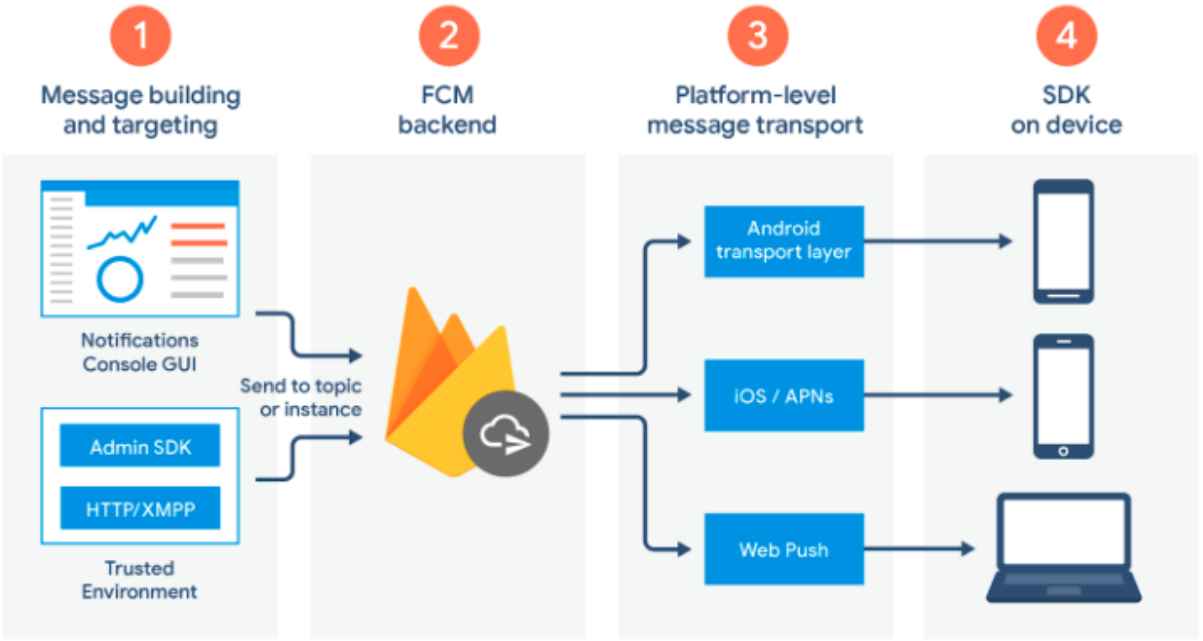
3.7.2 Use Case

For the product to be more effective and usable here are some of the use cases of how the user would interact with the product.

- Need to buy a product
- Need to explore vendors and their products
- Need to compare prices

- Need to discover discounts and offers

3.8 Architecture design of the new System



Chapter 4: The Software Development Model

4.1 Implementation and Coding

4.1.2 Description of implementation Tools and Technology

To have a fully functioning system here are the main functional requirements for the users.

Platform to Run on

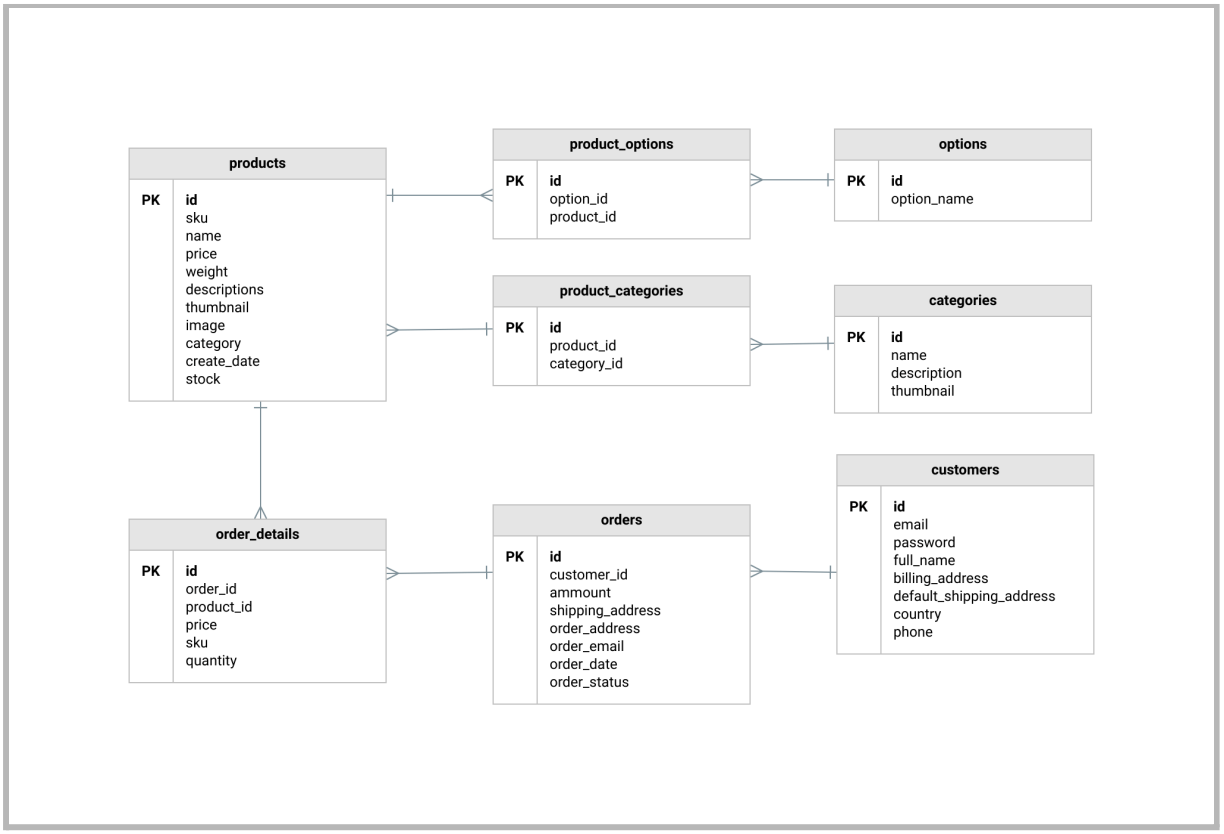
1. IoS - iPhone Operating System. The plan is to scale and include Android after a few months but for now, will only limit the implementation to IoS

Programming Language

1. Flutter Programming Language
2. Libraries and packages such as cloud firebase to keep users' posts
3. Web screen layout to support layout consistency

Database and ERD Diagram

1. Firebase database to store users' data



Other Tools

1. Instagram layout and style
2. Material UI from google for icons

3. Major platform iOS
4. Maze for usability Testing

Analysis and Comparison

Programming Language	Learning Curve	Build Time	External Support
Flutter	Low	Low	High
Swift	High	High	Low

For the buyers

1. Login
2. Product Catalogue
3. Buying Option
4. Linking Mobile Money Payment
5. Making Payment

For Sellers

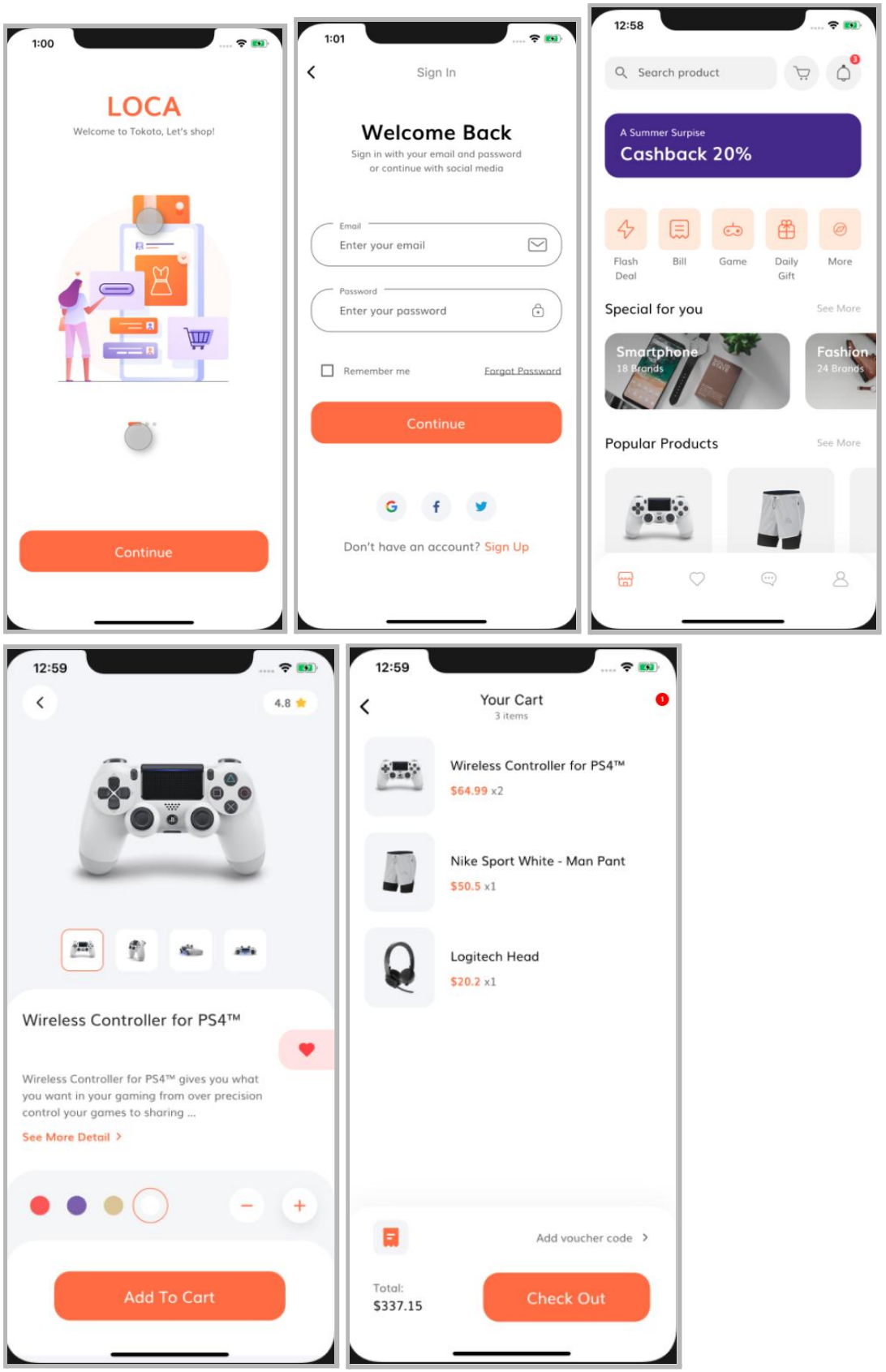
1. Login
2. Uploading products
3. Receive payment via mobile money
4. Send the product for delivery

4.1.3 Source Code and Screenshots

Link to the code repo: https://github.com/Wenseslaus/e-commerce

The system is set out for users to perform the basic functionalities like login, and create a post for sale, comment on other posts, like other posts and buy.

Product Screenshots



4.1.4 System Security

Security of the application is very important because it helps keep the system secure and out of attackers. This will be archived by setting security protocols inside and even outside the

application architecture. The users will also need to be aware of the security implication that might come up with the application and how to protect themselves. Here are some of the ways that security could be implemented.

- Developers will have access to the code repository
- User will have access to the system with the correct username and strong password. The system will set criteria for a strong password which is going to be at least 8 characters including letters, numbers and symbols.
- Users will not be allowed to reuse old passwords and changing passwords is going to happen every 3 months.
- Internal and External password policy
- Designers will have access to the wireframes
- The database for user information will be accessed using an API that is securely stored with an API Key.

4.2 Testing

4.2.1 Introduction

The main implementation of the suggested system is to encourage a shopping experience and this is mainly done using a platform that has social like features but still allows users to easily buy and sell different products. While testing the basic flow is for users to log in, create a post, comment, like and buy the product from other sellers. Here are a few screenshots of the implementation of the solution.

4.2.2 Objectives of Testing

How testing was conducted to the intended users for effective feedback.

To make sure the product solves the user's needs, it had to go through testing to get users' opinions and understand whether they would use the product or not. Therefore the approach to testing was very subjective and avoidance of bias.

The objective of testing

1. Find out if the product solves the core user need
2. Generate hypotheses that will prove different concepts through the application
3. Get a clear understanding of the users' pain points.

4.2.3 Unit Testing Outputs

The product was tested with a number of input values to see if it will generate the right output. This involves creating a post, commenting on a post, and buying of a product from the platform.

Testing was also done on the packages and libraries used to explore their functionality and if they are returning the right values

4.2.4 Validating Testing Outputs

```
.packages:
  33  flutter_svg:file:///Users/wenseslaus/Developer/flutter/.pub-cache/hosted/pub.dartlang.org/flutter_svg-1.0.0/lib/
  34: flutter_test:file:///Users/wenseslaus/Developer/flutter/packages/flutter_test/lib/
  35  flutter_web_plugins:file:///Users/wenseslaus/Developer/flutter/packages/flutter_web_plugins/lib/

  59  term_glyph:file:///Users/wenseslaus/Developer/flutter/.pub-cache/hosted/pub.dartlang.org/term_glyph-1.2.0/lib/
  60: test_api:file:///Users/wenseslaus/Developer/flutter/.pub-cache/hosted/pub.dartlang.org/test_api-0.4.8/lib/
  61  typed_data:file:///Users/wenseslaus/Developer/flutter/.pub-cache/hosted/pub.dartlang.org/typed_data-1.3.0/lib/

pubspec.lock:
  190      version: "1.0.0"
  191:   flutter_test:
  192      dependency: "direct dev"

  366      version: "1.2.0"
  367:   test_api:
  368      dependency: transitive
  369      description:
  370:       name: test_api
  371        url: "https://pub.dartlang.org"

pubspec.yaml:
  23  # Dependencies specify other packages that your package needs in order to work.
  24: # To automatically upgrade your package dependencies to the latest versions
  25  # consider running `flutter pub upgrade --major-versions`. Alternatively,
  26  # dependencies can be manually updated by changing the version numbers below to
  27: # the latest version available on pub.dev. To see which dependencies have newer
  28  # versions available, run `flutter pub outdated`.

  45    flutter_lints: ^1.0.0
  46:   flutter_test:
  47      sdk: flutter

.dart_tool/package_config_subset:
  196  file:///Users/wenseslaus/Developer/flutter/.pub-cache/hosted/pub.dartlang.org/term_glyph-1.2.0/lib/
  197: test_api
```

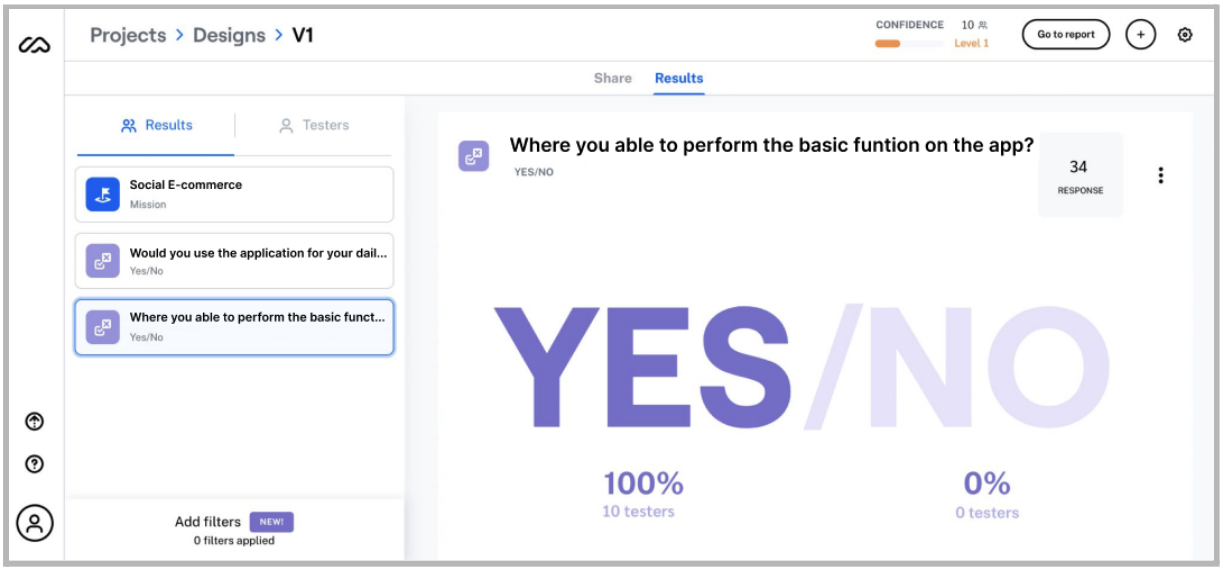
4.2.5 Integration Testing Output

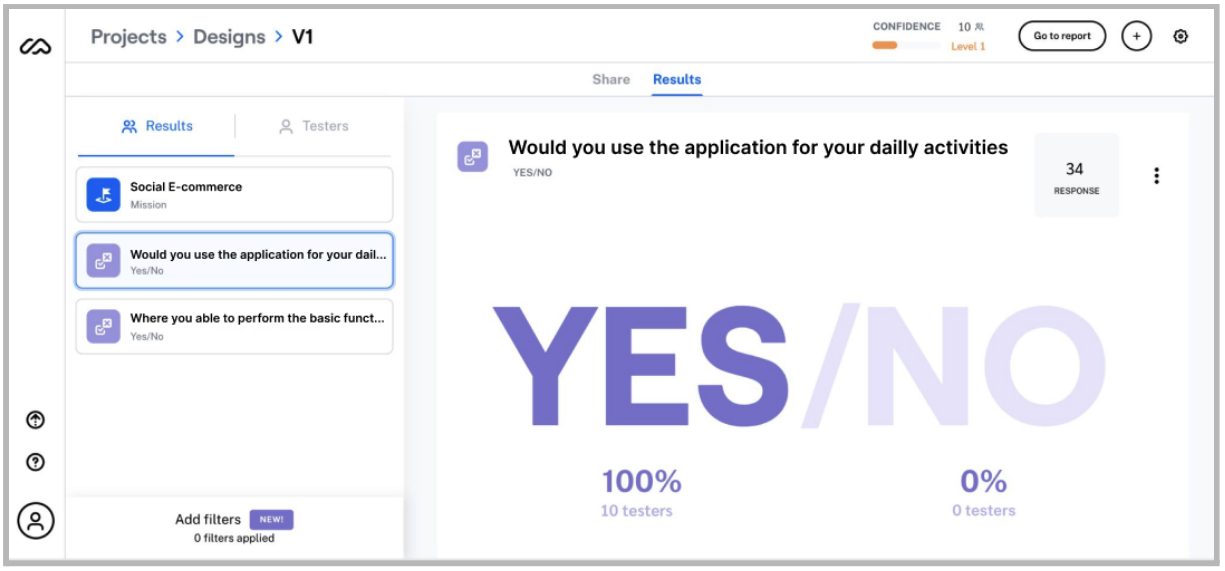
```
ios > Runner.xcodeproj > xcshareddata > xcschemes > Runner.xcscheme
<?xml version="1.0" encoding="UTF-8"?>
<Scheme
   LastUpgradeVersion = "1300"
   version = "1.3">
   <BuildAction
      parallelizeBuildables = "YES"
      buildImplicitDependencies = "YES">
      <BuildActionEntries>
         <BuildActionEntry
            buildForTesting = "YES"
            buildForRunning = "YES"
            buildForProfiling = "YES"
            buildForArchiving = "YES"
            buildForAnalyzing = "YES">
            <BuildableReference
               BuildableIdentifier = "primary"
               BlueprintIdentifier = "97C146ED1CF9000F007C117D"
               BuildableName = "Runner.app"
               BlueprintName = "Runner"
               ReferencedContainer = "container:Runner.xcodeproj">
            </BuildableReference>
         </BuildActionEntry>
      </BuildActionEntries>
   </BuildAction>
   <TestAction
      buildConfiguration = "Debug"
      selectedDebuggerIdentifier = "Xcode.DebuggerFoundation.Debugger.LLDB"
      selectedLauncherIdentifier = "Xcode.DebuggerFoundation.Launcher.LLDB"
      shouldUseLaunchSchemeArgsEnv = "YES">
      <MacroExpansion>
         <BuildableReference
            BuildableIdentifier = "primary"
            BlueprintIdentifier = "97C146ED1CF9000F007C117D"
            BuildableName = "Runner.app"
            BlueprintName = "Runner"
            ReferencedContainer = "container:Runner.xcodeproj">
         </BuildableReference>
      </MacroExpansion>
      <Testables>
      </Testables>
```

4.2.6 Functional and system testing Results

To cater for functional testing, potential users were invited to provide their opinion on how they felt about the system in general. This was done through a survey and this was the output results.

Two main questions were




Projects > Designs > V1
CONFIDENCE
10
Level 1
Go to report
Share
Results
Results
Testers
Social E-commerce
Mission
Would you use the application for your dail...
Yes/No
Where you able to perform the basic funct...
Yes/No
Add filters
NEW!
0 filters applied
Would you use the application for your dailly activities
YES/NO
34
RESPONSE
YES/NO
100%
10 testers
0%
0 testers

Chapter 5: The Description of the Application

User Guide/Manual

Login and Sign up

When they first log in users will be greeted with a welcome screen that will walk them through how to use the application.

After that, they will have to click continue when they have read and understood the instructions.

This will be followed by the login screen which will have an email and password. If the user doesn't have an account then they can click on the signup button which is placed on the screen and it will take them through the signup process.

All the designs are very easy and intuitive to understand to users should be able to navigate easily.

Browsing through the catalogue

After a successful login, users can browse through different sections of the application. This can be done through the search or from the card layout listed on the home page.

Viewing Product Details

To view more details about the product users can tap on any and this will give them a view that has full product details. This includes product name, description, photos, price, quantity, and other colour options.

Buying an Item

To buy an item users will need the add to cart button which will add the selected product to the cart/basket for payment processes. It's that simple.

6. Conclusion & Recommendations

6.1 Conclusion

Lastly, the future of the research is to test the demo and see the progress of the users. This will help determine the future direction of the project and what needs to be done to the product.

Also plan to share this with different stakeholders to get to hear their opinion and perspectives and change accordingly. Will also try to approach the government with suggestions on how to make e-commerce possible since we are being left behind as a nation while other countries seem to be benefiting a lot from it.

6.2 Areas for a further research

Further to this research I would like to explore more about the usage of the internet in Tanzania, bank and debit cards penetration, customers' willingness to buy and the development of other features that encourage social buying.

6.3 Recommendations for improvement for the study

To make the most out of this study for more improvement, there is a need to do the following;

- Enrol more users and get frequent feedback
- Encourage the government on friendly policies for SMEs to establish their business online
- Liaise with banks and mobile money operators for easy and convenient money transfer so the price of products doesn’t change significantly.
- Expand the team and scale the product to be used by more vendors

Reference list or Bibliography

Asiimwe B. Godfrey, Kamukama D (2017) Community Security Initiatives in low-income areas of Kampala, Makerere University Kenya Internet usage lags mobile penetration - Connecting Africa. (2021). Retrieved 18 October 2021, from http://www.connectingafrica.com/author.asp?section_id=761&doc_id=768744#:~:text=Kenya's%20mobile%20penetration%20grew%2011,penetration%20rate%20of%20just%2040%25.

Evans, Mlay (2020). FACTORS AFFECTING ADOPTION AND IMPLEMENTATION OF E-COMMERCE BY SMES IN TANZANIA: A CASE STUDY OF KINONDONI DISTRICT. Retrieved 2021 from http://scholar.mzumbe.ac.tz/bitstream/handle/11192/4476/MBA-CM-DCC_Evans%20Mlay_2020.pdf?sequence=1

Dar Es Salaam Population 2021 (Demographics, Maps, Graphs). (2021). Retrieved 18 October 2021, from https://worldpopulationreview.com/world-cities/dar-es-salaam-population

Lyata, Ndyali. (2013). Adaptation and Barriers of E-commerce in Tanzania Small and Medium Enterprises. Retrieved 2021, from https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.870.9019&rep=rep1&type=pdf

Materu M.B. and Diyamett B.D "Towards Evidence-based ICT Policy and

Regulation" Volume Two, Policy Paper 11, (2010)

Oreku, G., Mtenzi, F., & Ali, A. (2013). A Viewpoint of Tanzania E-Commerce and Implementation Barriers. Retrieved 18 October 2021, from https://www.researchgate.net/publication/271269086_A_Viewpoint_of_Tanzania_E-Commerce_and_Implementation_Barriers

Population, total - Tanzania | Data. (2021). Retrieved 18 October 2021, from https://data.worldbank.org/indicator/SP.POP.TOTL?locations=TZ

Tanzania Internet Penetration Reach 50% in March 2021, Data Traffic Up by 25% - TanzaniaInvest. (2021). Retrieved 17 December 2021, from https://www.tanzaniainvest.com/telecoms/internet-users-data-traffic-march-2021#:~:text=The%20latest%20telecoms%20statistics%20for,internet%20users%20in%20March%202020.

Research schedule

Activity	**Timeline**
Problem Definition, Aim and Objectives	2 Weeks
Literature Review	3 Weeks
Data Collection	1 Week
Data Analysis and Interpretation	2 Weeks
Research Results and Conclusion	3 Weeks
Solution Ideation	1 Week
Solution Design	2 Weeks

Budget

Item	**Quantity**	**Unit Price**	**Total**
Phone	1	$250	$250
Volunteer Data Collectors	30	$50	$1500