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An investigation into the issues faced by both, subsidence and commercial farmers in Sub-Saharan Africa (SSA), as a consequence of the western countries' involvement.

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## **ABSTRACT**

Fair trade is a term commonly associated with addressing the issue of poverty in Sub-Saharan countries through attaining a 'fair price' for the goods and services provided by agriculture farmers. Although fair trade is predominately a westernised movement imposed by those participating in purchasing and selling produce, the focus is on the range of platforms available to Sub-Saharan farmers enabling them to achieve 'fair prices' is less commercially written about. This dissertation study explores the research topic of ' an investigation into the issues faced by both subsidence and commercial farmers in Sub-Saharan Africa as a consequence of western countries involvement. Diving deep into the heart of the problem through conducting a thorough literature review of past articles and analysing current methods highlighted, not only a huge gap in the market which I felt my ideas could fill but magnified the severity that the oligopoly western market's impact has on the lives of millions of agriculture farmers. Through further examining the key issues expressed by agriculture farmers within this region regarding the aiding and development of current business models has allowed me to develop an innovative prototype solution with the aim to facilitate the buying and selling of commercially produced goods by both subsidence and commercial famers in Sub-Saharan Africa. The creation of this solution addresses issues raised by both end users and was devised through conducting an extensive research study composed of one-to-one interviews and small focus groups. The analysis of the results collated had provided a concrete system requirements specification to ensure both non-functional and functional features included in the prototype were built for purpose and correlated as recognised features expressed by users during the different design iterations. In attempt to affect this sector for the better long term, I hope that the awareness raised during this research study enlightens change and enables the African agriculture trade sector to achieve its true economic potential.

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I certify that the work presented in the dissertation is my own unless referenced.

Signature: *TIMOTHY CAMPBELL*

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## CHAPTER ONE – PROJECT OVERVIEW

### **1.1 Introduction**

Chapter 1 provides an outline of the project content reported during this investigative study. The chapter starts with a brief introduction, highlighting the issues this dissertation project will aim to address, while defining the aims and objectives set to be met by the full completion of this study. The project approach then details the consecutive processes undertaken before moving onto the overall dissertation outline which summaries the breakdown of each chapter in this project.

For the purpose of this project, I have chosen to conduct a research study which thoroughly investigates the main issued faced by both subsidence and commercial farmers in Sub-Saharan Africa (SSA) as a consequence of western countries involvement, mainly focusing upon businesses in England (UK). Derek Layder describes Investigative research as marrying evidence-based explanations of social behaviour with distinct strategies of data collection (*Derek Layder, 2018*). By performing an investigative research project, it will allow me to focus primarily upon the research participants expression of their thoughts and feelings, in order to develop an innovative system which not only fills the gap in the market but has identified features that can be recognised by the end users as solutions to the problems they have expressed as issues they are frequently presented with.

Agriculture is described as the science, art, or practice of cultivating the soil, producing crops, raising livestock and in varying degrees the preparation and marketing of the resulting products (*Haricourt, 2011*). There are a wide variety of agriculture acts which can be classified based upon different characteristics, such as, the type of crop being grown, scale of cultivation, intensity, mechanisation level, combinations of livestock and how farm produce is distributed. It is Africa's largest industry sector and is regarded as the single most important economic activity in Sub-Saharan Africa (SSA) in terms of its contributions to output, revenue generation, foreign exchange earnings and most importantly employing 70.4% of the continent's working population (*Sow, 2017*). The main issue of western countries involvement in agriculture is that their economic power and world status enables dictation of the prices of products, consequently meaning their aim is to obtain as much high-quality produce for as little price possible. For many large businesses in the U.K their philosophy is to maximise profits however, despite their moral consideration for the majority of agriculture farmers in SSA, this impacts their quality of life and ability to develop their business.

### **1.2 Research Aims and Objectives**

#### **1.2.1 Research Aim**

The overall research aim of this project is to produce a working prototype which, if implemented into a mobile application or an online website, will facilitate the buying and selling of commercially produced goods by both subsidence and commercial famers in SSA.

### **1.2.2 Research Objectives**

In attempt to achieve this aim, the following objectives must be completed:

- 1) Perform extensive background research through examining academic journals and articles to extract information into the trading of agricultural produce between regions in SSA and UK, in attempt to gain an enhanced understanding of the problems faced by the parties involved. Conducting research includes analysing existing services which offer international trade, in order to identify key features which, aids users in both buying and selling.
- 2) Identify & define the selected research methodology to be used through analysing the type of data needed to be collected. Research various data collection and analysis methods to conduct during this project, in order to accumulate relevant research participants and generate a design requirement specification, which will allow for a precise prototype to be created and evaluated with the end user for further development.
- 3) Research a range of interview techniques, selecting a suitable method which is simple to perform and considers the proposed constraints while also considering recruitment methods to select fitting participants to undertake the study. Conduct a series of interviews and focus groups in attempt to establish primary data which translates to both functional and non-functional aspects of each prototype.
- 4) Implement the selected methodology approaches to design a static prototype (low-fidelity prototype, sketches & diagrams) which reflects the requirement specification developed and uses participant input as direction for design ideas. Develop the prototype from static to dynamic (high-fidelity prototype, web software prototyping) acting upon the feedback provided through the evaluation of the first prototype and conduct further analysis and evaluation of the final prototype solution.
- 5) Perform a usability evaluation of the final prototype combining the method with a series of test queries, in order to evaluate the suitability of the final prototypes functional and non-functional features, this will show that the system can execute the intended specification requirements successfully.

### **1.3 Project Approach**

In order to successfully achieve the overall research aims and objectives, the project approach that is described below must be executed and accomplished fully.

#### **1.3.1 Background Literature Review**

All current and relevant academic literature must be examined in order to gain a comprehensive understanding of the main successes and issues found in previous published projects. This will enable me to establish a clear understanding of appropriate tools and procedures required to create a viable solution. Examining existing projects and applications & websites will allow me to draw upon the importance of the presenting information I find as well as, giving me further insight as to what the solution should address before it is designed, tested or evaluated. By using Google Scholar and Brunel University's Library, I will draw upon

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academic articles and journals to produce a detailed requirement specification that will help meet the overall project aim.

### **1.3.2 Design Iterations**

I aim to conduct two design iterations, where in the first I will compose a low-fidelity prototype in the form of sketches & diagrams which will be formulated through the findings from the background research I have previously conducted, and the requirement specification composed during the collection of research. The second prototype will be a high-fidelity prototype in the form of web software prototyping, which will integrate improved features explored during the evaluation process. The two methods of data collection I will conduct are interviews and focus groups, in performing these methods they will give me a concrete basis to form ideas and help address issues highlighted as areas of importance by participants.

### **1.3.3 Testing & Evaluation**

The prototypes I will create will be tested by performing a usability evaluation method, which will focus on non-functional testing of the prototype with the end user. I will ask the user to walkthrough the prototype highlighting positive and negative features. The aim is to identify any usability problems, collect qualitative and quantitative data to determine the participant's satisfaction with the product. I will use a combination of structured and unstructured session where I will require both end users to provide feedback about selected features. Throughout the final phase of evaluation, I will be able to assess the success of the final product in relation to meeting the research aims and objectives set.

### **1.3.4 Conclusions**

Drawing conclusions of the project will allow me to assess the success of selected methodology approaches completed during each stage of the research study. I will also examine whether the proposed data collection and analysis methods have enabled the creation of a successful solution which addresses key issues raised during the literature review and research collection phase. Once drawing the final conclusions, this will inspire me to suggest future improvements I can implement.

### **1.3.5 Project Ethics**

The ethical approval must be granted by the research committee before any research is conducted to ensure the guidelines are understood and adhered to by all parties. Ensuring the necessary procedures are followed, protects the research participants allowing them to feel fully comfortable with expressing their views and opinions, which could cause distress or lead to further implications.

#### 1.4 Dissertation Outline

The structure of the dissertation consists of 7 chapters, which are expressed through the flowchart diagram below. Each research objective will be met throughout the different chapters of this study and will be analysed in the final evaluation.

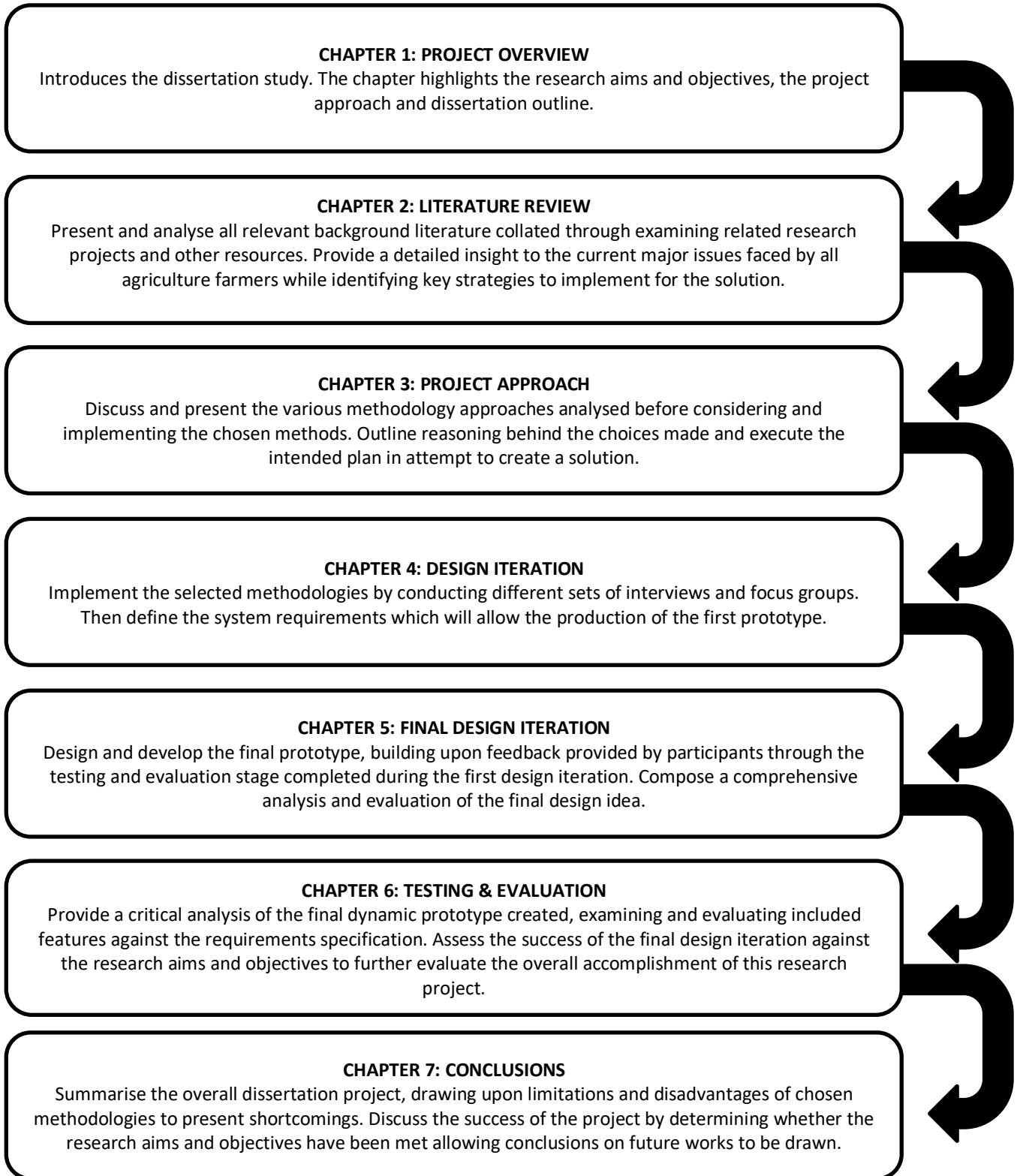


Figure 1. Flow chart outlining the dissertation structure

## **CHAPTER TWO – LITREATURE REVIEW**

### **2.1 Introduction**

Chapter 2 provides a detailed review of existing background literature which relates to the agriculture industry in Sub-Saharan Africa. Further analysis of this research identifies the foundation in which the intended solution will attempt to eradicate the main issues occurring in this trade and will present all relevant and important researching findings.

### **2.2 Current issues within the Agriculture Trade Industry**

The agriculture trade sector in Sub-Saharan Africa (SSA) is notably the most important source of livelihood for the majority of African's, employing as high as 75-80% of the working population. In terms of global socioeconomic status, in the 42 countries of continental Sub-Saharan Africa, it includes 21 of the 24 poorest countries in the world with an average agricultural labour wage of less than \$1.10. Many strongly believe that the agriculture industry remains key to unlocking Africa's true economic potential, despite the lack in adaptation to the current westernised technological advancements, ultimately resulting in the lack of development within the industry (*Farmafrica, 2021*). Despite its huge agricultural potential, Sub-Saharan African countries have not yet benefited from it and experienced the highest prevalence of undernourishment worldwide, poverty levels and food famine. The labour force is still stuck in subsistence production for many reasons and has yet to overcome many of the issues it faced over half a century ago. In the history of agriculture, food production in Sub-Saharan Africa grew by about 1.5% p.a. in the 1970's (up to 1979) compared to about 2.0% p.a. in the 1960's which began to show signs of an evolving market. However, the overwhelmingly evidence suggests that a major cause of the poor performance described above is the poor price and exchange rate policies from foreign countries has limited the overall development of the market (*Shimeles 2018*).

- In agriculture, women face particularly severe challenges despite representing 47% of the labour force, they are prominently subsidence farmers because the patriarchy system has tended to discriminate against them.
- Smallholders often are obliged to sell part of their production immediately after harvest, when prices are at their lowest level as harvest season coincides with the beginning of the school year, and farmers decide to sell in order to pay for their children school fees, books and uniforms.

#### **2.2.1 Western worlds impact**

The west has tried to implement new solutions to try mend the years of underpayment and bad business they have provided Africa with for decades. Their global status and strong currency have always allowed for the dictation of unfair pricing and negotiations between farmers who are living below the global poverty line. The issue remains because the supply is so high, but the demand is so attainable, farmers are left with no other choice but to agree on deals which see them lose out. For decades the west has operated on the international markets importing products such as coffee. As of May 2019, Arabica beans were trading at 86 cents a pound – the lowest since 2004. The price of cocoa collapsed by 33% at the end of 2016 and has still not fully recovered.

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The continuing global slump in prices means many coffee and cocoa farmers can't pay for the basics like food, housing and education. The global markets for both commodities are notoriously volatile. Over production, climate change, currency exchange rates and government policies all influence prices. (Abril, 2019)

### **2.3 Current Solutions**

The creation of modern services in aiding and developing the trade industry are far from being able to bridge the gap. Due to the economic potential many large countries and businesses have explored the potential financial gain in investing within this industry however, the current attempts have yet been ground-breaking. A newly devised 'super platform' is a type of digital agricultural solution which bundles together separate solutions to mediate one platform, multiple different services for farmers or other smallholder value chain intermediaries and, typically, integrates digital advisory services, market linkage services, and financial services, among others (*Addom, 2020*). Super platforms are pushing the boundaries of financial inclusion around the world, creating millions of new jobs and stimulating trade, especially in rural markets. Developing, operating and sustaining a super platform is extremely complex and difficult hence the lack of financial investment yet to be injected into this method. Their main purpose is connecting customers and merchants as (*Mercy Corps, 2019*) research shows they are increasing subsidence and commercial farmers' incomes by 50% or more. As the market is ever-growing, companies are providing more focused nuanced models exceling the bypassing of middlemen is resulting in better prices for goods sold. Converting farmers to digital marketplaces will require trust built on strong customer experience. Trust is a key driver for the success of any e-commerce platform that links buyers and sellers, particularly across the distances and risk factors of agriculture. While some platforms provide explicit guidelines to help users benefit from the platforms, others increase user trust by enhancing quality checks and providing safe payment methods. While obtaining the correct kind of relationships and trust between farmers and countries takes decades to build and as history recalls the relationship between Africa and the west has always had external strains (*Addom, 2020*).

### **2.4 Conclusion**

Exploring currently literature has only stressed the importance and need for the creation of my prototype. in obtaining as much data and information directly from the participants involved, I believe this will enable me the recipe to create something not only sustainable but beneficial for both parties. The next decade will dictate the direction and direct involvement the west will have upon the market before other super continents become involved.

## **CHAPTER THREE – PROJECT APPROACH**

### **3.1 Introduction**

Chapter 3 of this dissertation will outline the core research method adopted after analysing various methodology approaches, software tools and techniques that could be implemented. I will discuss how suitable the various methods are to perform, in attempt to successfully achieving the research aims and objectives set in chapter 1. Throughout this chapter, the process of recruiting participants is examined, including a detailed analysis of the data collection and analysis methods used. There is also a considerable acknowledgment of the ethical approval procedure undertaken during this study.

### **3.2 Methodology Approaches**

A methodology approach is portrayed by (*Creswell, 2003*) as a coherent group of methods that harmonise one another and that have the capability to fit to deliver data and findings that will reflect the research question and suits the researcher's purpose. There are three main approaches to consider when conducting research, they are quantitative, qualitative and mixed research methods. Researchers typically select a quantitative approach to respond to research questions requiring numerical data, a qualitative approach for research questions requiring textual data and the mixed methods approach for research questions requiring both numerical and textual data (*Leedy & Ormrod, 2005*).

A research methodology determines the direction that your study will follow. The focus is on the manner in which the depth and quality of collecting your data is conducted. Furthermore, the methodology can also determine the analytical tools you will be using for deriving conclusions from the data collected. The research process is systematic in that defining the objective, managing the data collected and then communicating the findings occurred within established frameworks and in accordance with existing guidelines. The frameworks and guidelines provide researchers with an indication of what to include in the research, how to perform the research, and what types of inferences are probable based on the data collected. In order to select a suitable research methodology, I have looked into the 3 main research methods - qualitative, quantitative and mixed research methods.

#### **3.2.1 Mixed Research Methods**

A mixed research method combines quantitative and qualitative data collection and analysis in one study. By combining both research methods, the researcher gains in breadth and depth of understanding and corroboration, while offsetting the weaknesses inherent to using each approach by itself. One of the most advantageous characteristics of conducting mixed methods research is the possibility of triangulation. (*Heale R & Forbes D, 2013*) Claim that triangulation allows the researcher to identify aspects of a phenomenon more accurately by approaching it from different vantage points using different methods and techniques.

A key advantage of this method can also be described as a limitation to some, due to combining quantitative and qualitative approaches which can balance out the limitations of each method and it can also provide

stronger evidence and more confidence in your findings. While on the other hand, this process can become very complex to carry out, as well as it being a lot of work for one person to undertake due to the constraint on resources and time to complete.

### **3.2.2 Qualitative Research Methods**

Qualitative Research is primarily exploratory research. It is used to gain an understanding of underlying reasons, opinions, and motivations. It provides insights into the problem or helps to develop ideas or hypotheses for potential quantitative research and is more associated with words, language and experiences rather than measurements, statistics and numerical figures. This type of research begins with a problem statement and involves the formation of a hypothesis, a literature review, and a quantitative data analysis. (*Creswell, 2003*) states, quantitative research “employ strategies of inquiry such as experimental surveys and collect data on predetermined instruments that yield statistical data”.

### **3.2.3 Quantitative Research Methods**

Quantitative Research allow you to test a hypothesis by systematically collecting and analysing data. It is used to quantify the problem by a way of generating numerical data or data that can be transformed into usable statistics. (*Balnaves, 2001*) states that quantitative approaches quantify attitudes, opinions, behaviours, and other defined variables and generalise results from a larger sample population, this research method is widely used in social and natural sciences when the research aims, and objectives are confirmatory in nature. The objective of quantitative research is to develop and employ mathematical models, theories, and hypotheses pertaining to phenomena. The process of measurement is central to quantitative research because it provides the fundamental connection between empirical observation and mathematical expression of quantitative relationships (*Wikipedia, 2020*).

Research Methods		
Qualitative Research	Advantages	Disadvantages
Grounded Theory	<ul style="list-style-type: none"> <li>➤ Provides for Data Depth &amp; Richness</li> <li>➤ Provides for Intuitive Appeal</li> </ul>	<ul style="list-style-type: none"> <li>➤ Exhaustive Process</li> <li>➤ Potential for Methodological Errors</li> </ul>
Ethnographic	<ul style="list-style-type: none"> <li>➤ Provides a comprehensive perspective</li> <li>➤ Observes behaviours in their natural environment</li> </ul>	<ul style="list-style-type: none"> <li>➤ Dependent upon the researcher's observations &amp; interpretations</li> <li>➤ Difficult to check the validity of the researcher's conclusions</li> </ul>
Phenomenological	<ul style="list-style-type: none"> <li>➤ Researcher can look at change processes over time</li> <li>➤ Help to understand people's meanings and ideas</li> </ul>	<ul style="list-style-type: none"> <li>➤ Data gathering can take a long time and require a lot of resources</li> <li>➤ Analysis and interpretation of data can be difficult</li> </ul>
Quantitative Research		
Descriptive	<ul style="list-style-type: none"> <li>➤ Effective to analyse non-quantified topics and issues</li> <li>➤ The possibility to observe the phenomenon in a completely natural and unchanged environment</li> </ul>	<ul style="list-style-type: none"> <li>➤ Descriptive studies cannot test or verify the research problem statistically</li> <li>➤ The majority of descriptive studies are not 'repeatable' due to their observational nature</li> </ul>
Correlational	<ul style="list-style-type: none"> <li>➤ Can collect a large quantity of information from many subjects at one time</li> <li>➤ Can study a range of variables and their interrelations</li> </ul>	<ul style="list-style-type: none"> <li>➤ Correlation does not indicate causation</li> <li>➤ Problems with self-report method</li> </ul>
Experimental	<ul style="list-style-type: none"> <li>➤ Test causal relations</li> <li>➤ Can be combined with other research methods for rigor</li> </ul>	<ul style="list-style-type: none"> <li>➤ Subject to human error</li> <li>➤ Personal bias may impact the data &amp; results concluded</li> </ul>

**Table 1. Comparing the advantages & disadvantages of various research methods**

(Alzheimer Europe, 2009)

### **3.2.4 Selected Research Methodology**

In analysing and comparing various qualitative, quantitative and mixed research methodology approaches, I was able to gain a comprehensive understanding of the requirements for each method. By examining each approaches advantages and disadvantages, it allowed me to make an enhanced decision as to which method would be most suitable to perform. (Creswell, 2003) States that no particular method has an advantage over others, and that actual questions of the research study should help determine the choice of method.

Therefore, taking into consideration factors such as project duration, the resources available and pre-existing knowledge of the research topic, I have opted to select a qualitative research method. I believe for the purpose of my study a quantitative or mixed research method involving rigid data collection methods and specifically numerical data would not be imperative or useful in determining which data to collect, design and implement.

The methodology approaches I intend to perform are focus groups and 1-2-1 Interviews. A focus group is a research technique composed of 6-10 carefully selected participants and is used to collect data through group interaction, where participants are encouraged to participate in discussing a given topic. Focus groups are used to identify and explore how people think and behave shedding light upon 'why', 'what' and 'how'

questions. 1-2-1 interviews differ in the sense that they involve asking open-ended questions to converse with respondents and collect elicit data about a subject through a one-on-one discussion. I intend to compose both structured and semi-structured interviews to gain a range of feedback.

### **3.3 Sampling Design Approaches**

Firstly, participant recruitment began by identifying a set of characteristics that I would need each participant to fulfil, this then led me to narrow down my search and select an audience who would ensure only relevant data would be collected. (*Base, 2021*) The two types of participants who were selected were commercial & subsidence farmers in SSA and retailers & suppliers in UK. I decided to focus primarily upon collecting farmer participants first, as the sample size was likely to be a lot smaller and I had to rely upon referral sampling to gain the exposure in collecting an acceptable sample size that would enable me to draw detailed conclusions. Once I was satisfied with the audience I had generated, I then began to get into contact with UK retailers and suppliers, where through an extensive process were I able to collect the necessary data and information (*Barrat, 2009*) (*Stats, 2021*).

#### **3.3.1 Participant Recruitment**

The range of participants were formed through two non-probability techniques, the first method I used was Judgement sampling and the second method I adapted was a form of Snowball sampling. Initially, I could only get into direct contact with one commercial farmer in SSA, I had to then select a methodology approach which would appeal to my target audience and ask them if they would be interested in participating in the research of my study. Therefore, the first non-probability technique exercised was Judgment sampling which is described as selecting units for inclusion in a study based upon the professional judgment of the researcher (*Frey, 2018*). This method best suited the recruitment approach as I had already previously identified my target audience and made contact with someone who identifies as fulfilling the set criteria which later became the path to receiving more inquiries about my research.

The second non-probability technique I opted to use was Exponential Non-Discriminative Snowball Sampling. This method is described as the researcher collating information and data of a participant who they have personally located, who then relays the purpose and intentions of that investigation to friends or family who are members that fall into categories relevant to my study (*Glen, 2014*). Through this method it allowed me to gain access to subsidence and commercial farmers, who were located in rural areas with limited access to technology making the recruitment process increasingly difficult, by providing multiple referrals. Each new referral then provides with more data for referral and so on, until I collated an acceptable quantity of subjects for the sample. In relation to targeting UK based suppliers and retailers, again I used the same form of snowball sampling, where important information regarding the purpose of my study and how I intend to perform the collection of data was portrayed to businesses and individuals asking them to contact me if they'd be interested taking part.

### **3.4 Data Collection**

For the purpose of collecting data, I have chosen to conduct primary research. Primary research is defined as a methodology used by researchers to collect data directly, rather than depending on data collected from previously done research (*Imed B, 2020*). I believe that the advantages of this approach, allow me to dictate the authenticity and reliability of the data, as well as being able to solely focus upon collecting data specifically directed to finding a probable solution to the dissertation title. The primary research I intend to collect will be in the form of qualitative data, as previously mentioned, this method involves the collection, analysis and management of data, assessing factors like the thoughts and opinions.

In selecting a qualitative approach, it has narrowed down the range of methods I could perform to achieve the desired results. Factoring in the current COVID-19 pandemic, there are restrictions and altered guidelines which impose implications to certain data collection methods impacting the way in which I perform the two chosen data collection methods, focus groups and interviews. Interviews are a conversation-based inquiry where questions are used to obtain information from participants, they can operate in both a structured and unstructured manner composed of open and closed questions. The interview process will be conducted through a virtual assistance software called skype, where I will be able to hear and see each participant and send them relevant documents which will be referenced throughout the interview. Another tool I will use is Microsoft Outlook, which is a personal information manager software system which will enable me to stay in contact with all participants, organise meetings and discussions during the pandemic.

Focus groups are a combination of interviewing, surveying, and observing a collection of individuals which all share one common subject, the research topic. Through this process participants can share and discuss their views through open-ended questions posed by the researcher, this leads for development of thought and creation of innovative ideas while also allowing participants to express their opinions sparking debate or consolidating theories. Focus groups have a distinct advantage over other types of research because they are flexible by design. You can listen to someone's tone and view their body language when talking to better understand how they feel about a particular subject (*Writing, A, 2019*).

### **3.5 Data Analysis**

For the purpose of data analysis, I have opted to select the KJ method which is also known as an Affinity diagram. This tool is one of the seven project planning methods and was devised by Jiro Kawakita, a Japanese anthropologist in the 1960s. It is used to collate large quantities of ideas, stemming from brainstorming, to be sorted into groups based upon their natural relations for further analysis and reviewing (*Wikipedia, 2020*). Due to the simplicity and ease in performing this method, I believe this approach to be best suited during the design and development stage of conducting research, in attempt to allow users to generate innovate design ideas and help organise large volumes of data and ideas through discussions during focus groups. The KJ method is performed following 6 steps.

STEP	DESCRIPTION	HOW TO PERFORM
1	Determine a Focus Question/Issue	Address the main topic area of discussion ensuring participants fully understand what the question means in order to generate related thoughts and discussions.
2	Brainstorm and record ideas	This process involves making notes, whether its static sketches or a series of words related to that chain of thought on ideas concerning that issue.
3	Display recorded ideas	All ideas expressed by participants are randomly displayed in one area without any organisation of placement, allowing participants to read through the generated ideas to gain further insight.
4	Group similar ideas	There is no talking amongst participants during this process, ideas are collated into affinity sets which display correlated ideas into organised groups based upon their natural relationships.
5	Create header cards	A header is an idea that captures the essential link among the ideas contained in a group of cards, then this idea is written on a single card however it must consist of a phrase or sentence that clearly conveys the meaning.
6	Draw the finished Affinity diagram	This involves writing the problem statement at the top of the diagram and then placing the header cards above the groups of ideas. Finally, the last process is to review and clarify the ideas and groupings by discussing the meanings and saying why certain ideas are correlated.

Table 2. Instructions on how to perform an Affinity diagram

(Citizens Advice, 2015)

### **3.6 Ethical Consideration**

The ethical approval to conduct research for the project was granted by the College of Engineering, Design and Physical Sciences Research Ethics Committee at Brunel University London, on 16/02/2021. Research ethics are essential in guiding researchers to conduct and report their findings while complying with the moral guidelines agreed to, prior to starting the project as well as helping to establish the validity of the research. There are five main principles which must be abided by (*Stanford, 2021*):

- 1) Do no harm
- 2) Obtain informed consent
- 3) Protecting anonymity and confidentiality
- 4) Avoiding deceptive practices
- 5) Providing the right to withdraw

Having been granted permission to conduct the research for this study between 17/02/2021 and 26/03/2021, this shows acknowledgement to the guidelines and principles obliged by in order to comply with the requests. All participants were provided with a participant information sheet and consent form, which gave those selected a further insight into why the research was being conducted and how the data that was being collected, will be used. For many participants It was important that they felt respected and knew they have full control over their data and information at any stage of the study. I had notified them that they are able to withdraw any information they had given or that has been collected about them at any point they may feel compromised. Copies of the transcripts made were sent directly to the participants involved to ensure they felt comfortable with the inclusions of the statements and conversations documented.

## CHAPTER FOUR – DESIGN ITERATION

### **4.1 Introduction**

Chapter 4 focuses upon the selected design approaches used through the different iterations of the design process. The process commences with the accumulation of the requirement specification and justifying the importance of ensuring the necessary criteria is selected to cover all expectations of the end user and presents the explored design ideas generated by both end users and researcher. Following the step-by-step stages involved in creating the final prototype allows the reader to gage a clear understanding of ‘why’ certain methods were selected and ‘how’ and ‘what’ ideas were chosen.

### **4.2 Implementing the Research Methodology**

#### **4.2.1 Conducting 1-2-1 Interviews**

I began the design iteration by conducting 1-2-1 interviews with three separate UK-based grocery retailers and suppliers. The research commenced with me asking a series of open-ended questions to gain a detailed understanding the role of technology in aiding the searching, purchasing and communication between buyer & seller. I have picked out some of the main questions asked which have translated to the requirements specification and some features included in the first prototype. I have included some extracts of the conversations between the participants and myself, highlighting the important responses which led me to include certain features in the first prototype.

*Question 2: ‘Do you use a specific website or application which helps you to source and purchase foreign produce?’*

(All Participants) explained that they used a combination of websites which were compatible as mobile applications, which allows them to search and purchase for international produce. Through these sites they include all import and export taxes, transportation and delivery of those goods which is a key benefit to working with those companies. (Participant Six, P6) expressed the ease of navigation through the mobile application they use which helps with efficiency as they are able to get their orders up on their mobile device, rather than having to always log into a computer, they found this feature to be their main benefit.

(Participant Seven, P7) Stated that nowadays technology is very important, and the creation of mobile applications has made the process a lot easier to complete transactions. The main method they use is a website which is predicated but is an efficient as it is easy to use and they’re familiar with using it, the important features include personalised notifications to inform them of order progress and an instant messaging service which is more effective than email as it is real time.

*Question 6: ‘What would you identify as the main weakness of the method you currently use?’*

(Participant Six, P6) Expressed the main disadvantage of the service they operate with is they do not have a mobile application which is compatible with both android and apple which is confusing and not as efficient as

other methods which have been explored. They stated that they're currently in transition to find a new feature which complies with both formats and will aid them in their day-to-day transactions.

(Participant Seven, P7) Mentioned that the main weakness of the method they used it that they find it very difficult to navigate around the website, there is a lack of coherence and sometimes finding emails of previous orders can be very difficult and frustrating as there is no chronologic flittering of the emails, so they have to be searched for one by one which is considerably time consuming.

*Question 7: 'Can you suggest any improvements you would implement which would better this method?'*

(Participant Eight, P8) stated 'The main improvement I would suggest to the method I use is having an instant messaging service rather than communicating through emails as the response time is a lot longer with emails. Time is of the essence when completing these transactions and being able to talk about orders in a shorter space of time would increase customer satisfaction.'

(Participant Six, P6) mentioned that 'The most important feature to me is the service is available and compatible with all platforms. This will allow for easier use whether it be in the office on a laptop or desktop or on the go in the form of a mobile application, this will increase customer satisfaction.'

*Question 10: 'In terms of design features, what do you look for in a well-presented mobile application or online website?'*

(All Participants) were in agreement that the main design feature which is the most important is consistency.

(Participant Six, P6) Explained that contrasting text to the background theme is really important. It makes it easier to 'read and understand the information presented on the screen without struggling or having to squint'. This is a common feature they found to be reoccurring with online websites which do not use web safe colours or consider accessibility features such as enlarged text or colour-blind users.

(Participant Eight, P8) said 'The most important design feature for me is a coherent layout. An application that is well thought out not only makes it easy to use but when it is aesthetically pleasing to the eye it makes for an enjoyable use. This can be achieved through a simple but well-designed layout of the features, grouping together similar functions and providing a broad coverage of everything that is needed.'

#### **4.2.2 Conducting Focus Groups**

Next, I composed a focus group of 5 participants who were agriculture farmers in SSA. During this session I began with courteous formalities before ensuring all participants had completed the consent forms and that they understood the proceedings of the focus group. The session was structured in 4 sections, aiming to last between 60-90 minutes.

- 1) Q&A
- 2) Show me - Tell me
- 3) Composing an affinity diagram
- 4) Formulating specification requirements

### 1) Q&A

#### Question 1: 'What current methods do you use to help you sell your products?'

(Participant One, P1) (Participant Two, P2) (Participant Three, P3) All stated that they used local distributors who had connections with large foreign businesses to help them sell their produce. They would come and collect the produce directly from their farm as well as dealing with delivery and transportation of the products. They expressed it is a very common method for farmers in their region to deal with these kinds of people, through the word of mouth between local commercial farmers it allows for relationships to be built between themselves and these distributors who in turn would offer them prices for their produce and arrange deals. (Participant Four, P4) Mentioned that they travel with their produce to the capital once a week so they can try and negotiate better priced deals with 'tradesmen' instead of operating with local distributors. They stated that while local distributors are a lot easier to deal with the price, they offer you is considerably lower and sometimes they are unreliable as they do not pay on time.

(Participant Five, P5) Stated they use online websites to sell their produce, which allows for direct purchases, better communication of order details and organising of financial transactions for a monthly fee. They expressed not many people use this service due to the monthly fee being so expensive and not worth their while.

#### Question 4: 'If you were to use a mobile application or online website to help you sell your product what kind of features would state are necessary?'

(All participants) Shared the same view in expressing the main feature would be an effective and easy communication service which would enable each seller to build relationships with buyers, discuss any issues or potential future deals.

(Participant Three, P3) Mentioned that 'For me the main feature I would expect the service I am using to have is, a way of tracking all outgoing orders, detailing information like order size and financial structure etc... over a 4-week period.

(Participant 5, P5) Mentioned 'The main feature I would expect the service to provide would be a personalised version of the service, so that when I log in, I can see all relevant information about my business such as the number of orders and the amount of earnings over a period of time'

#### Question 5: 'in terms of visual presentation, describe what your ideal design ideas would be, for example colour schemes, background colours etc...?'

(All Participants) were in agreement that visual presentation is as equally important as functionality of the application. The common theme among participants were to use contrasting colours which are professional and do not make the main task more difficult to perform. Colour schemes of black & white, blue & grey and white & red were advised as something they would like to see.

(Participant Three, P3) Mentioned that 'A menu bar or scroll bar in necessary to select all of the functions the service has to offer. It is important that all the essential features are presented straight away, and you do not have to search for them.'

### 2) Show me – Tell me

Next, I presented two websites which I had found and explained they offer a similar service to the one I intend to produce. <https://www.selinawamucii.com/> & <https://crofarm.com/> are two websites which both allow users to buy and sell produce from the regions they specify upon, I explained I would like the participants to navigate throughout the website for 10-15 minutes and then note down:

- Features they think are important
- Features they thought were confusing or unclear to use
- What aspects of the design of the website they liked and disliked

From the feedback provided about the two websites explored and ideas formulated about the methods they currently used; we were able to compose an affinity diagram to organise the information.

### 3) Composing the Affinity Diagram

The figure below shows the composed affinity diagram with the data sorted into relevant categories. This allowed me to then generate a systems requirement specification with the participants ensuring all the essential functional and non-functional requirements were to be met by the completion of the final prototype. The main benefit of performing an affinity diagram is it's a very clear visual presentation of random clusters of ideas, the coherence and order of ideas allow for an enhanced visual analysis to identify the key issues or development stages needed to be completed to ensure all angles of the project scope are covered. Personally, this method helped me a lot with the organisation and prioritisation of features to be included on the application. On the other hand, the main disadvantage of this method is that it is very time consuming, and it can become complicated when ideas do not seem to appear in clear categories, which could lead to missing out on key information or ideas.

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Figure 3.Affinity Diagram (1)



Figure 2. Affinity Diagram (2)

#### 4) Formulating the Specification requirements

A requirement specification is an imperative establishment to identify before commencing a design process, the list provides an initial basis for the designer to start, the main focus is to outline all of the core requirements the product or service must do or a quality it must possess. Ivy Hooks states “The specification is a collection of the set of all requirements that are to be imposed on the design and verification of the product, including all other related information necessary for the design, verification, and maintenance of the product” (Hooks, 2004). The process of generating and collecting the requirements specification points were completed during the interviews and focus groups. As the application needs to facilitate the needs of both agriculture farmers and western world purchasers, it was important to listen and incorporate key features expressed to me as being essential ‘must haves’ by the participants during those processes. In completing an affinity diagram, it ensured I had covered all functional and non-functional requirements of the application.

ID	REQUIREMENT	REQUIREMENT DESCRIPTION
1	The application must allow new users to sign up	Users must follow the instructions provided to allow them to sign up using their own credentials which comply with the systems requirements
2	The application must allow existing users to log in	By using the credentials used to sign up with, the user is able to log into the application to access their personalised version of the application
3	The application must have a user selection choice for buyers	The application must have an option for buyers to select the correct version of the application
4	The application must have a user selection choice for sellers	The application must have a different option for sellers to select the correct version of the application
5	The application must be fully functioning	Users must be able to navigate throughout the application successfully without any errors or bugs
6	The application needs to be straight-forward & easy to use	Users must be able to explore all features of the application without any training or pre-existing knowledge
7	The application must allow buyer to place auction bids on products	Buyers will be able to place a bid on a product rather than purchasing the item at the set price
8	The application must allow the seller to set lowest bid accepted per product	Sellers will be able to set a minimum accepted price of the product to gauge the price bidding should occur at.
8	The application must allow for direct communication between buyer & seller	Users must be able to contact any seller for further information and communication purposes through a specific feature on the application
9	The application must calculate and display monthly statistics	The application must offer a monthly summary of all orders, calculating overall costs and stock levels for both users
10	The application must facilitate purchase transactions	The application must allow users to use the specific ‘payment system’ feature to order desired products.
11	The application must be able to send push notifications	Users must be able to receive relevant information about their existing orders both through application notifications and emails sent directly to the address used to log-in with.
12	The application must use appropriate colour schemes and font styles & sizes	The application must use web safe colours, which are contrasting making the information easy to read and coherently ordered in a professional manner.

**Table 3. Specification requirements with description**

#### **4.2.3 Limitations of Interviews & Focus Groups**

It is suggested that a focus group should be composed of 6-10 participants in order to gain a range of non-biased answers. I found that with the challenges of COVID-19, it was very difficult to communicate and obtain a large enough sample size to comply with the methods requirements therefore, I had to conduct the focus group with the participants I had been able to attract.

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as a consequence of western countries involvement

Another difficulty was that some members of the focus group were vocally more dominating than less forthcoming individuals, which is challenging to moderate (Langford & McDonagh, 2002). Although each participant was given ample time to express their views and share their ideas, some felt more comfortable and were better equipped socially to manage the demands of the focus group. I believe this had a minor impact on the data that was collected, however it is still a contributing factor to consider.

The final limitation of conducting a focus group is the unintentional bias. I carefully thought about the structured questions I would ask to ensure the development of ideas and thoughts were not coerced or impacted by my own views however sometimes with natural flowing conversations it is difficult to moderate some opinions I may have expressed.

The limitations with this method are that the sample size I had accumulated was not big enough and I feel that with a broader variety of retailers I would have been able to grasp the full concept clearer as it would be been expressed by a large sample size. Due to COVID-19, it made getting into contact with UK retailers and suppliers a lot harder as many shops were closed and human interaction is limited.

Another limitation of this method is that the connection quality between me and participant three was not great, there were technological issues which meant that we had to change from skype to zoom in order to conduct the interview process. This was not a part of the plan and took a considerable addition of time however it would not be an issue if the interviews were conducted in person.

#### **4.3 Prototyping Methods**

I began by conducting research into a range of prototyping methods so that I could select an appropriate approach, learn what it entails and execute the requirements to ensure I would achieve the expected outcome. When selecting a methodology, there are many important factors to consider ultimately to ensure that the method selected, is suitable for the full duration of the design iteration. The main factors are:

- The people: This relates to considering who the participants involved during the designing stage and the end users who will test & evaluate the prototype are.
- Ease of use: This relates to how difficult the method is to perform, considering factors such as time to complete, range of resources available and personal skill level.
- Requirements: This relates to how the user will perform the chosen methodology, what software is used, what training is required or the type of tools that will be used.

Prototyping Methods			
	Description	Advantages	Disadvantages
Storyboards	A story is communicated through the use of large images and a limited amount of text.	Allows yourself to visualise the user's journey or how users would experience a problem or product.	The message is not always clear or detailed enough due to the restriction in number of words used.
Sketches & Diagrams	Sketches, diagrams and mind maps are drawn in order to illustrate a system, process, or the structure of your ideas through rough notes or drawings.	Very easy to perform as requires minimal tools and skill.	Can be difficult to grasp a full understanding of how the service or product operates due to the method of tangibility.

Experimental	Involves acting or role-playing, which allows participants to express first-hand emotions and body gestures while trying to relay the experience of using a product or service.	Allows for further depth in understanding the interaction between human and service or product than other methods.	Running an effective experiment takes repeated practice and collaboration therefore is not the simplest method to perform.
Physical Models	Involves creating something tangible that can be tested and evaluated. A range of rough materials such as paper, cardboard clay or foam are used to portray a visual representation of the product designed.	Enables users to provide a more detailed account of their experience when conducting testing.	Can be time and resource consuming depending upon tools used and experience in performance.

**Table 4. Comparing the advantages & disadvantages of various prototyping methods**

#### **4.3.1 Selected Prototyping Methods**

In selecting an appropriate method, it was important that I gained a comprehensive understanding of the range of methods available to perform and what each different method entailed. For the purpose of designing the prototypes throughout the design iteration I will compose a combination of low-fidelity prototypes and high-fidelity prototypes. The fidelity of the prototype refers to the level of detail and functionality built into a prototype so for the first prototype, I have chosen to compose a low-fidelity prototype in the form of diagrams & sketches. This method is very simple but effective in communicating the first stages of design ideas due to time it takes to sketch out ideas. Low-fi design prototypes are made from basic materials like paper, with drawings, minimal text and various colours used to briefly explain how a concept will look. For the second prototype, I will use end user feedback and advance the low-fidelity prototype into a high-fidelity prototype. This method is normally computer-based and covers both the user interface of the product in terms of visuals & aesthetics and also the user experience aspects in terms of user interactions, user flow and behaviour (*Teo. S, 2021*)

#### **4.4 Prototype One**

The figures below show the first prototype created, there is consideration to the inclusion of important features, their sizing & placement and other details such as colour schemes and font styles. A further analysis of design ideas is required to appropriately change or include new features to suit the needs of both end users, and in the final design iteration the process of evolving this prototype to a dynamic model begins with this initial prototype.

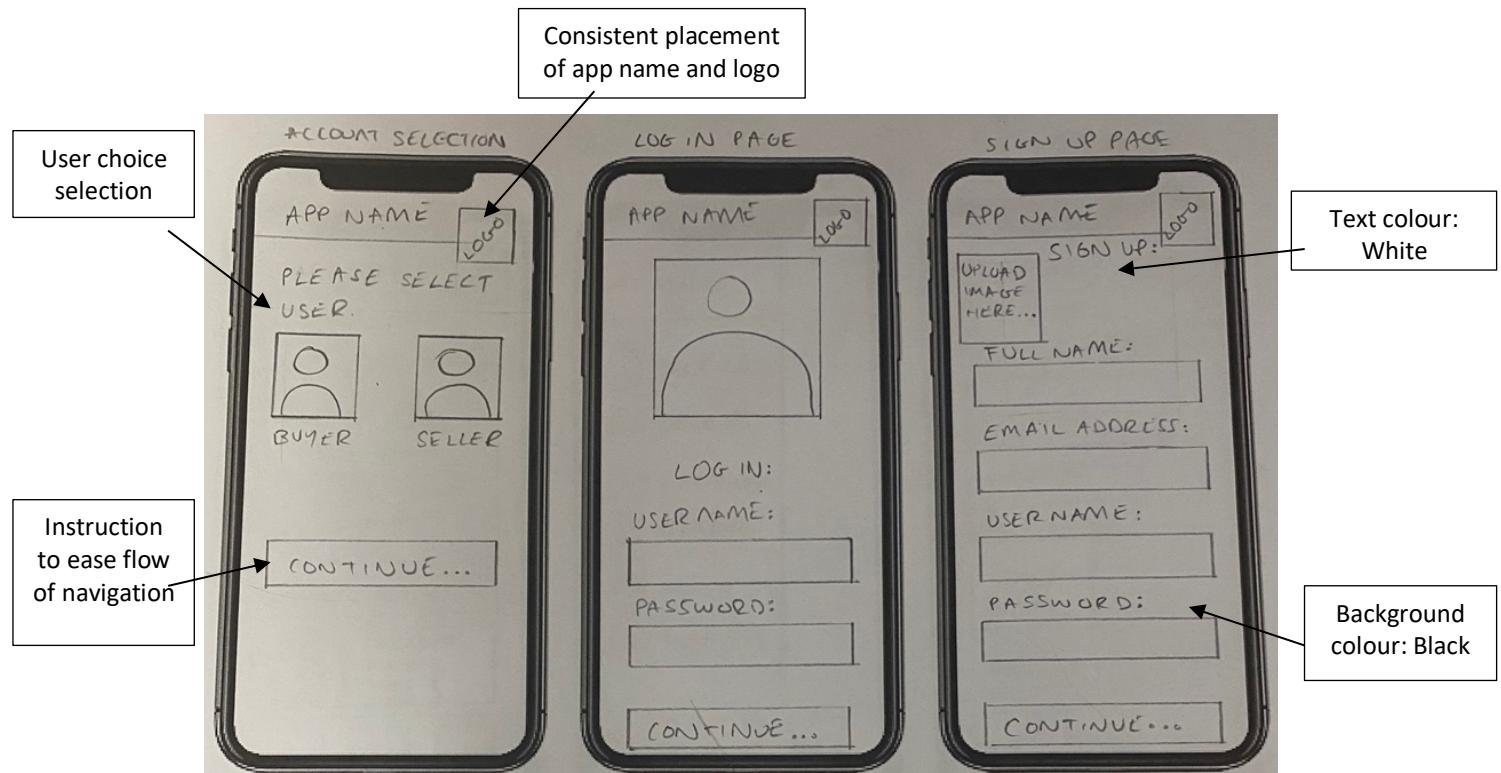


Figure 4. Prototype One (1)

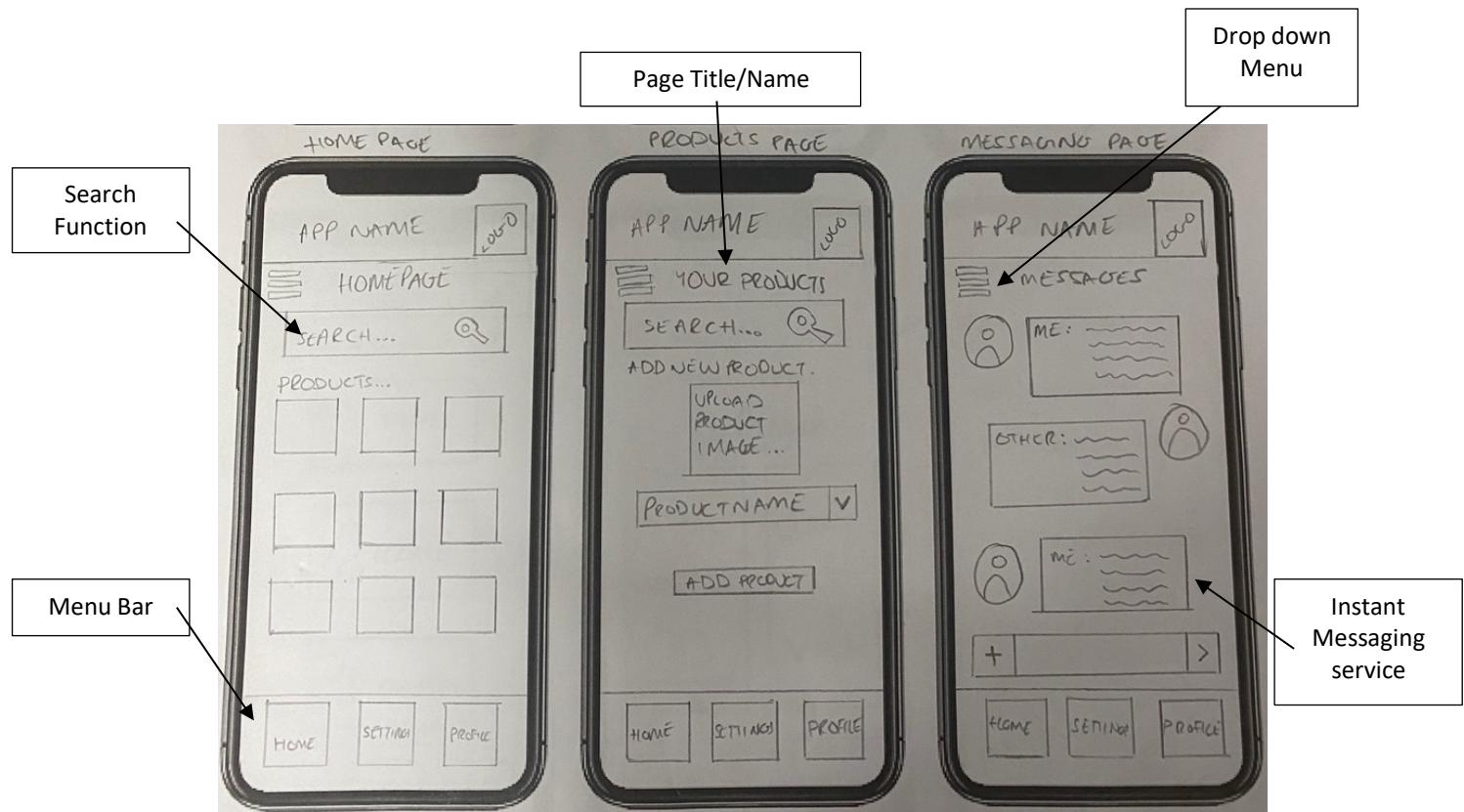


Figure 5. Prototype One (2)

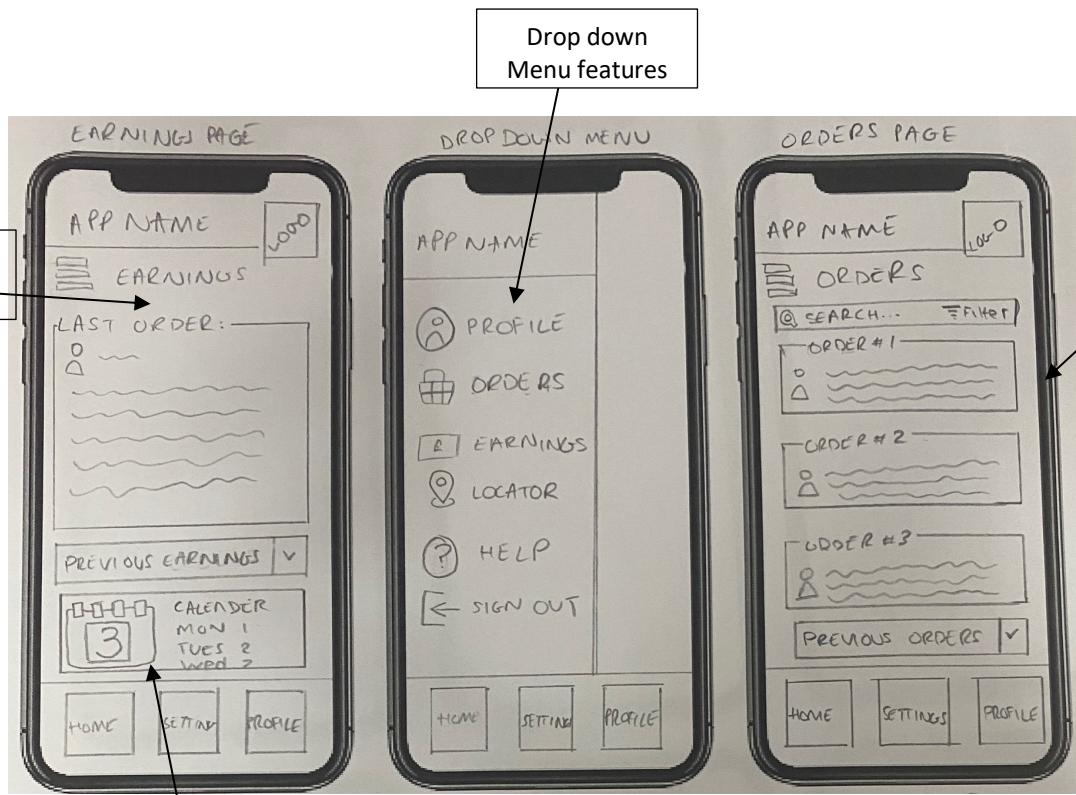
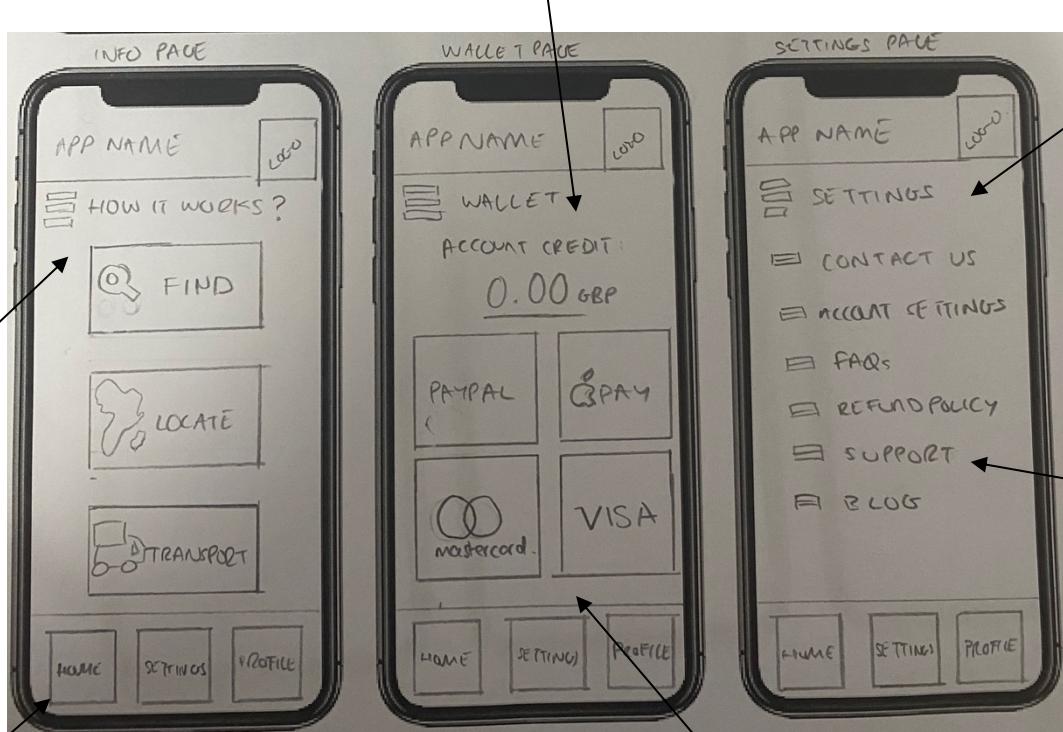


Figure 6. Prototype One (3)

Calendar Function

Filter Function



Information page

Payment page for buyers

Settings page accessible from menu bar

Text Size: 10

Font style:  
Tahoma

Payment methods accepted

Figure 7. Prototype One (4)

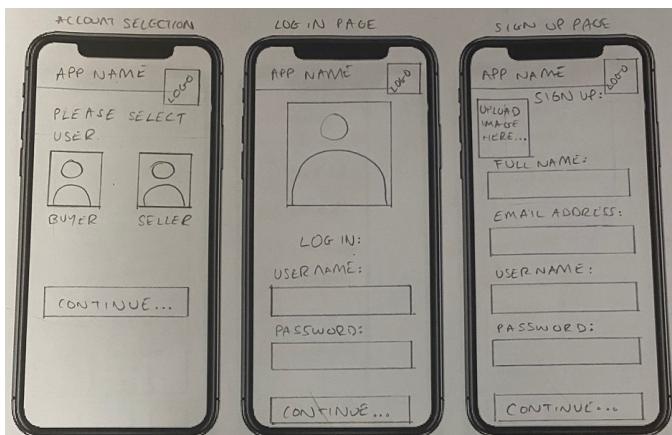
## CHAPTER FIVE – FINAL DESIGN ITERATION

### **5.1 Introduction**

Chapter 5 commences with the second design iteration in producing the final prototype. Formulating the final design idea will take into consideration the design process undertaken in chapter 4 and generating innovative ideas related to the negative feedback received from the first prototype. The chapter will also include an extensive feedback session with participants to establish their views and potential future works which could further develop the prototype.

### **5.2 Gathering Feedback**

For the purpose of generating feedback on the first prototype, I composed another focus group where I presented the design ideas I had generated and gave the participants 10-15 minutes to look through the design ideas. I opted for more of an unstructured approach, allowing the participants to speak freely and ask any questions about any features. Through this approach I gained negative and positive feedback on the prototype which would enable me to generate the final prototype with all the feedback and new ideas incorporated.



**Figure 8. Prototype 1 (1)**

#### Log in & Sign-up Pages

(Participant Three, P3) Mentioned that they liked the idea of two separate pages for logging in and signing up with the incorporation of uploading an image to personalise their version of the application. (Participant One, P1) agreed that it was an interesting feature, but it should be included further in the application on the profile section, to speed up the signing up function as it is not imperative. (Participant Two, P2) Mentioned they liked overall design structure, it is presented professionally and has a neat look. They suggested to incorporate some more images to bring more colour to the design to contrast the background and text colour.

#### Account Selection Page

(Participant One, P1) Stated they liked the idea of being able to select which type of user was signing up to use the application, it is an important feature they suggested that needed to be included. They advised to space out the text and images using the whole screen to ensure things are clear and easy to follow.

(Participant Two, P2) Mentioned that the images could be a lot bigger and more central to make better use of the space provided. They also mentioned that a background colour of light grey would be a better contrast for black or white text, whichever is visually more pleasing.

(Participant Three, P3) Mentioned that they would like the placement of the app name and logo more central but reiterated that the logo design idea was interesting yet questioned whether it would look aesthetically pleasing against a black background. They mentioned they thought the idea of black and white was quite boring and suggested to incorporate a bright colour such as yellow or orange.

### Home Page

(Participant Four, P4) Stated the search bar function on the home page is a nice feature which is very important for ease of use. They also liked the display of recently viewed or purchased items on the home screen so that they can be selected easily.

(Participant Two, P2) Mentioned that they liked the drop-down feature which also helps with navigation and suggested that only the main important features should be included in the within the bar so that functions can be searched for and completed easily.

(Participant Five, P5) Mentioned that they did not like the design of the menu bar at the bottom of the page, the use of rigid squares with writing was not something interesting. They suggested to incorporate more colour and less rigid structures.

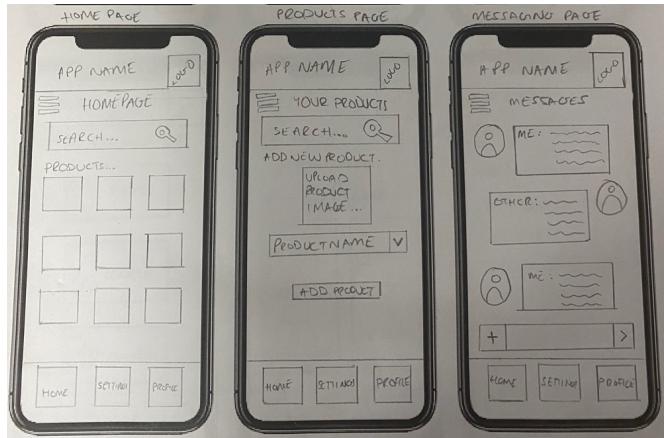


Figure 10. Prototype 1 (2)

### Products & Messages Page

(Participant One, P1) Mentioned that they liked the page name at the top with everything displayed clearly it will help with navigation. They also agreed that the inclusion of this feature is a necessary one that needs to be fully functioning.

(Participant Three, P3) Stated that they did not like the overall design of uploading and previewing products on your page. It was a bit unclear as to what that page's main purpose is and suggested to have two separate pages for uploading new products and previewing existing products.

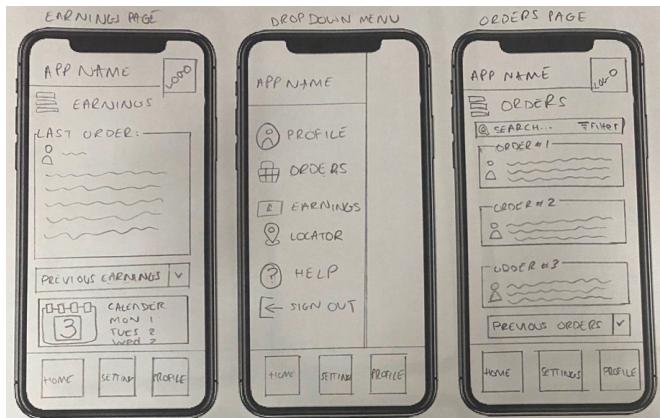


Figure 11. Prototype 1 (3)

### Earnings & Orders Page & Drop-down Menu

(Participant Six, P6) Stated they liked the earnings feature incorporated in the application. The included feature of the calendar was an interesting one which when explained how it could be used was a welcomed addition to the page.

(Participant Seven, P7) Mentioned that they liked the way the drop-down menu includes all of the important features and is well designed with an icon/image representing the words.

(Participant Eight, P8) Said they liked the overall design of the orders page and that it was a necessary feature to include. When explaining how the filter button words the inclusion as welcomed and suggested its an important feature which will help with the usability of the application.

(Participant Seven, P7) Suggested that they would like the search function to be included in the earnings page so that it makes the usability of that feature a lot easier and quicker.



Figure 9. Prototype 1 (4)

### How it works & Wallet page

(Participant Eight, P8) Mentioned that the idea of the 'how it works' page is a good idea for both buyers and sellers. Providing it has up to date and relevant information in this section it is an important feature. They stated the design of that feature is also well organised, but I need to ensure to incorporate colour to make the feature stand out.

(Participant Six, P6) Stated they liked the wallet page which shows the payment methods accepted, however they questioned the importance of this feature moving forward in developing the prototype.

### Settings Page

(Participant Two, P2) Mentioned that they liked the way the drop-down menu includes all of the important features but needs to ensure all functions are fully operational & useful before deciding on including them in the final prototype.

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### 5.3 Final Prototype

In designing and producing the final high-fidelity prototype, I have used a web-based software tool called Adobe XD, this will allow me to present an interactive, visual presentation of the final prototype, allowing users to get a sense of functionality and usability of the application before it is implemented into an actual application.

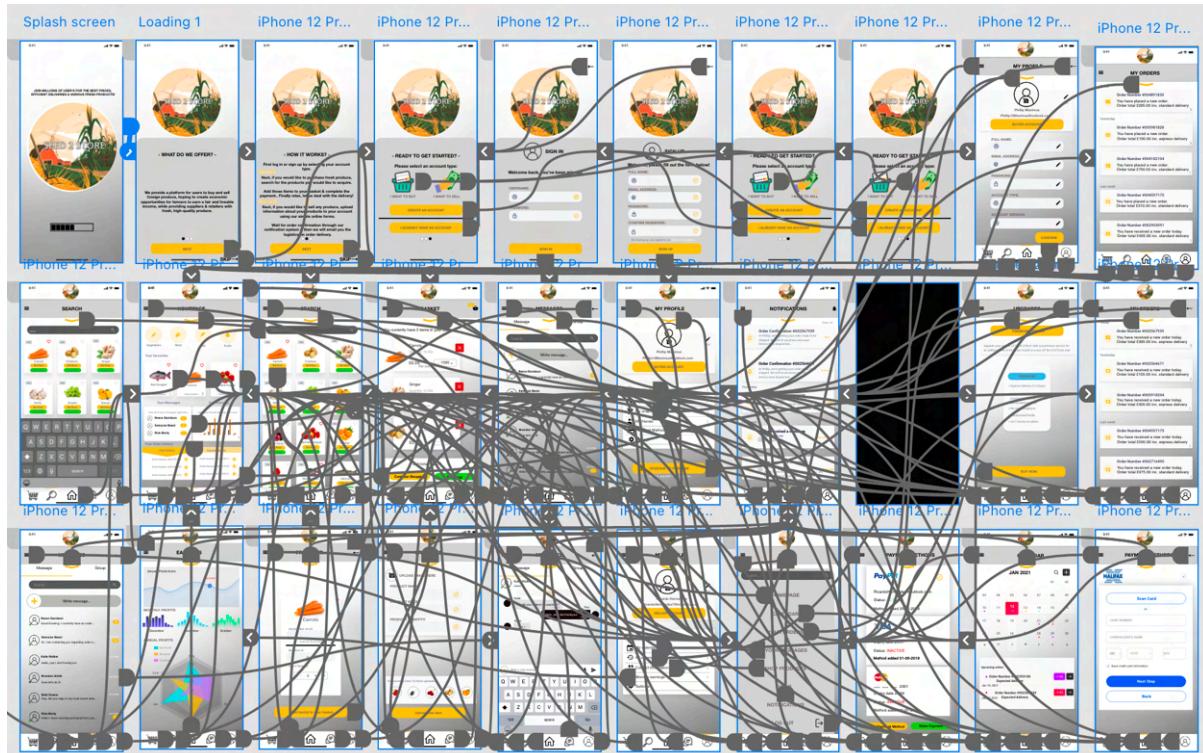


Figure 12. Wireframe showing the connectivity of final prototype

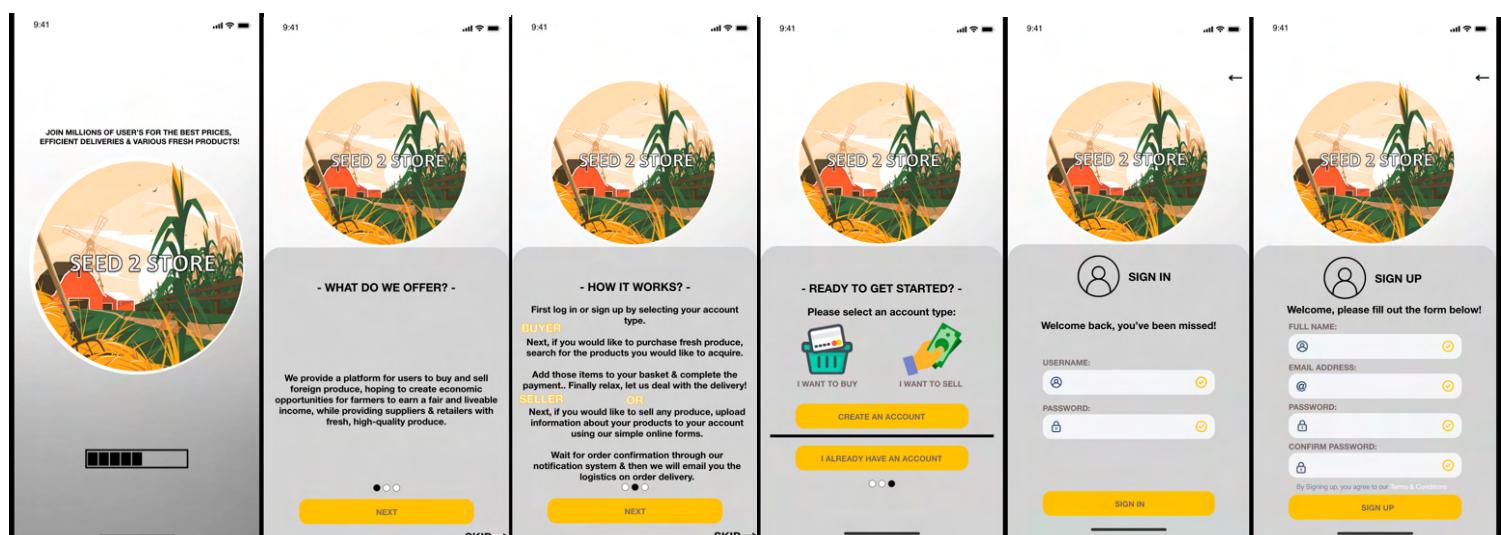


Figure 13. Final Prototype (1)

An investigation into the issues faced by both, subsidence and commercial farmers in Sub-Saharan Africa (SSA), as a consequence of western countries involvement

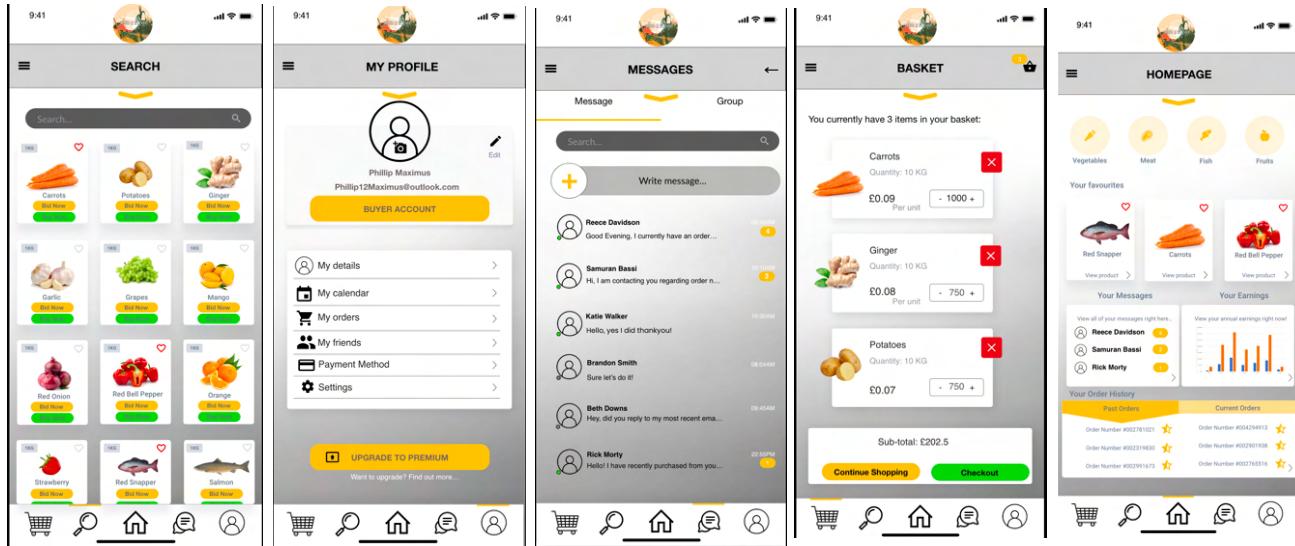


Figure 14. Main features on the menu board (2)

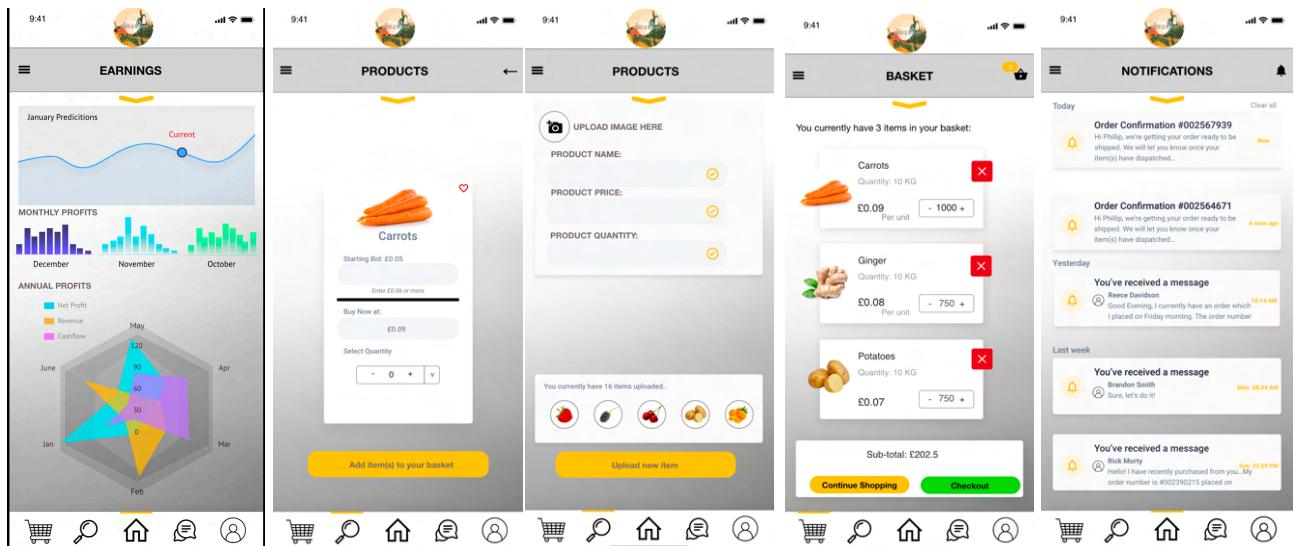


Figure 16. Additional features in the final prototype (3)

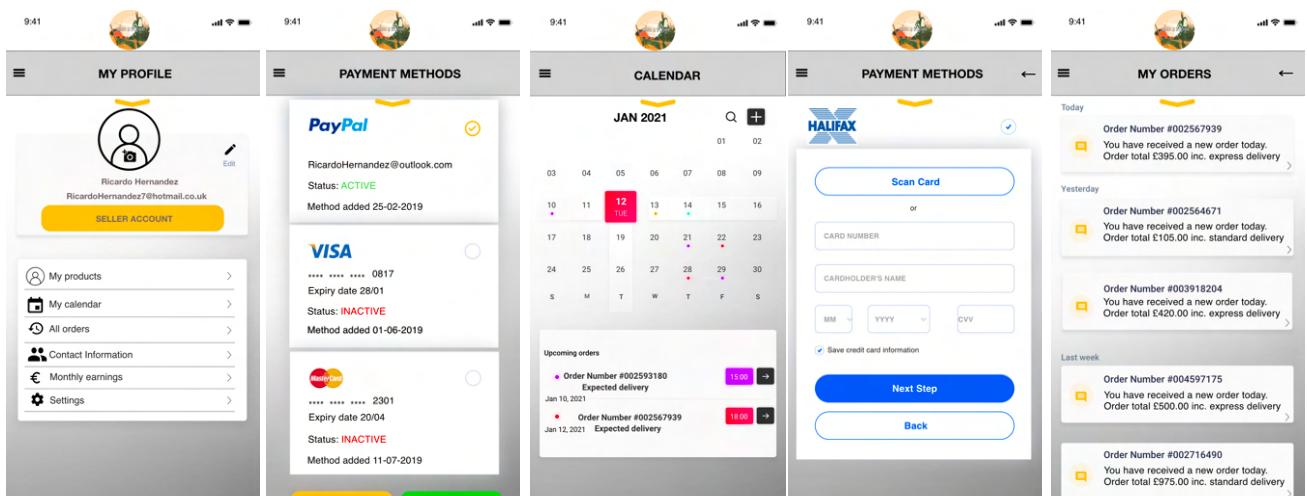


Figure 15. Additional features in the final prototype (4)

## CHAPTER SIX – TESTING & EVALUATION

### **6.1 Introduction**

This chapter consists of comparing different usability testing methods to select a suitable approach to implement. In comparing a range of methods, it will enable me to evaluate the final prototype against the research aims and objectives as well as the design specification outlined in chapter 4. The chapter begins by evaluating a range of different strategies to assess which methodology best suits the desired results intended and then performing that selected method presenting the findings before draw conclusions and presenting potential future works.

### **6.2 Usability Evaluation Methods**

Usability testing means to evaluate a service or product by testing it with end users or participants within your study. It is performed by participants trying to complete set tasks while observers watch, listen and take notes on body language and expression of views. The overall aim is to identify any usability issues while collecting qualitative and quantitative data to determine the participant's satisfaction with the product. In selecting the appropriate method, I had to consider the type of testing that needed to be performed which was based upon the research aims and objectives.

Testing methods	Description	Advantages	Disadvantages
Moderated	Moderated testing is a usability testing technique that requires the active participation of a moderator who works directly with the test participant, guiding them through the testing process	Moderated testing gives you more control. This testing allows guidance and support.	Moderated testing needs a pre-planned structure which has already organised the time and date with your test participants.
Unmoderated	Unmoderated usability testing is completed by test participants in their own environment without a moderator present and is usually used to test specific parts of a product rather than providing an overall review of the user journey.	Unmoderated testing is less expensive and quicker than moderated testing. Also, as there is no moderator the test participants interact more naturally with a product.	Since unmoderated tests are completely unsupervised, there is no real-time support for test participants, and they will need to solve problems on their own.
Remote	Remote usability testing allows you to conduct user research with participants in their natural environment by employing screen-sharing software.	Eliminates both the need for a lab environment and the effect of a lab environment on participants	There is no observation of the user's body language which might provide further insight of how they react or impose themselves
In-person	In-person testing involves gathering participants within the same location to be observed. Both moderated and unmoderated usability testing can occur in this method.	In-person testing provides further in-depth data as the researcher can observe the participant first-hand and analyse their body language and facial expressions to gain a better understanding of how they interact with the service or product.	In-person testing can be very expensive and time-consuming as you have to find a suitable location and find a specific date which suits all participants who sometimes require payment if pre-agreed to participate within your study.

Comparative	Comparative research methods involve asking users to choose which of two solutions they prefer, and they are used to compare a website with its primary competitors.	Giving participants the opportunity to experience multiple design solutions means they compare the pros and cons of each different products/services they use while drawing comparisons to provide useful feedback.	This method can sometimes be expensive and time consuming to set up as there are more than one product or service to test per participant. Due to the duration, it takes, participants usually expect to be paid considering their heavy involvement.
Explorative	Explorative tests are open-ended. Participants are asked to brainstorm, give opinions, and express emotional impressions about ideas and concepts.	The main advantage of this method is users are able to freely express the issues they come across while using the product or service. As there no set tasks or requirements for the user to perform their feedback is solely based upon their experience.	If the researcher is looking for specific feedback, because the session is relatively unguided the feedback, they may receive may not cover all aspects of the product or service, therefore it may not be all useful data that they gather.

**Table 5. Comparison of evaluation methods**

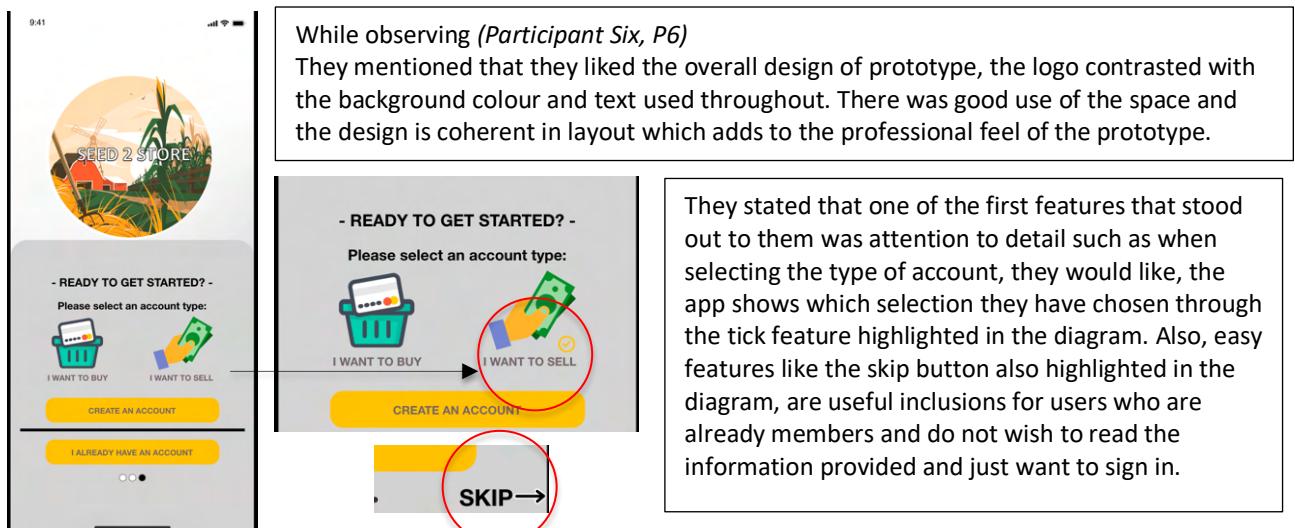
### **6.3 Implementing the Selected Methodology**

Taking into consideration the advantages and disadvantages of each method I have researched, as well as the implications of COVID-19, my choice was guided by those factors and I have opted to select a remote moderated usability test. The method I will perform will be computer-based interviews and involves observing participants while they navigate throughout the final prototype and give me feedback based upon the task, I have asked them to perform. The test task I have asked them to perform is:

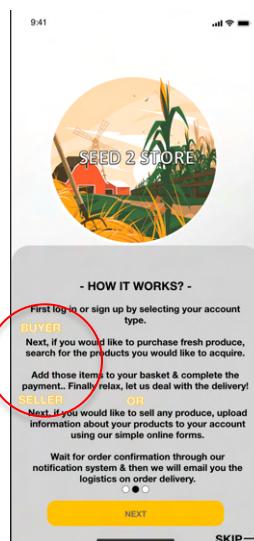
- 1) Navigate throughout the prototype while thinking about the usability of the prototype and the design of features included in the prototype.

#### **6.3.1 Test Results**

I began with conducting separate sets of interviews with all participants in order to get the perspective of UK retailers and suppliers, who would use the application as a buyer and agriculture farmers in SSA who would use the application as a seller.



**Figure 17. Evaluation of final prototype (1)**



**While observing (Participant Eight, P8)**

They mentioned that they liked the inclusion of the 'what do we offer' and 'how it works' section as it offers information and guidance for new users who may need further detail as to what the applications main function is.

They mentioned that the 'buyer' and 'seller' text was not easy to read without zooming in because of the colour schemes used and advised to just maintain a darker colour to contrast against the background in the future.

**- HOW IT WORKS? -**

**BUYER**  
Next, if you would like to purchase fresh produce, search for the products you would like to acquire.

Add those items to your basket & complete the payment. Finally relax, let us deal with the delivery!

**SELLER** OR  
Next, if you would like to sell any produce, upload information about your products to your account using our simple online forms.

Wait for order confirmation through our notification system & then we will email you the logistics on order delivery.

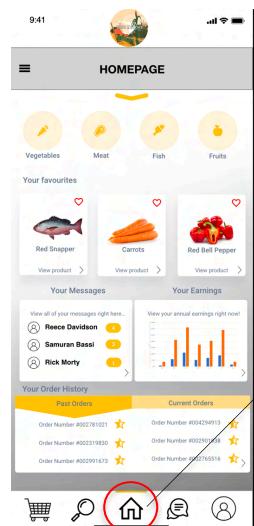
**NEXT**

**- WHAT DO WE OFFER? -**

We provide a platform for users to buy and sell foreign produce, hoping to create economic opportunities for farmers to earn a fair and liveable income, while providing suppliers & retailers with fresh, high-quality produce.

(P8) also mentioned there is too much text to read in such a short space of time, the login process is meant to be quick and informative yet there is a lot of information to read. They advised to include all this information inside of the prototype as it is useful to know for new users.

Figure 18. Evaluation of the final prototype (2)



**While observing (Participant Seven, P7)**

Spent approximately 2-3 minutes on the homepage exploring all of the features. They mentioned that the design evolution from the first prototype to this one exceeded their expectations, it has all of the relevant features they asked of included on the homepage which makes them easily accessible for the user. They mentioned that the menu bar at the bottom was well adapted to the feedback also, the icons were clear what they allow you to do once clicking on them and all connectivity between pages operated in a logical manner.

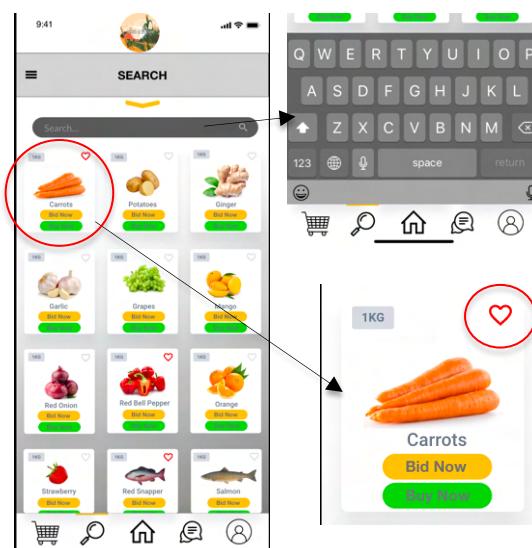


One of the little features (P7) enjoyed was how the menu bar icon changed as the different pages were selected, which signified to the user what page they were on.



(P5) also stated that the menu bar was very well designed, it had only the important features included which were easy to interpret.

Figure 19. Evaluation of the final prototype (3)



**While observing (Participant Six, P6)**

Mentioned that they liked the design of the search page which is designed similarly to the first prototype. The images and text are clear contrasting against the background and well organised which doesn't make the page look overcrowded.

They also mentioned that they small features such as the items weight and the favourites icon were interesting features to include which appear on the homepage too. Being able to search for products they want to purchase is an important inclusion.

(P4) liked the development from the static prototype showing the users favourite products to the heart icon displayed on each products image, highlighted through the use of the red colour.

Figure 20. Evaluation of the final prototype (4)

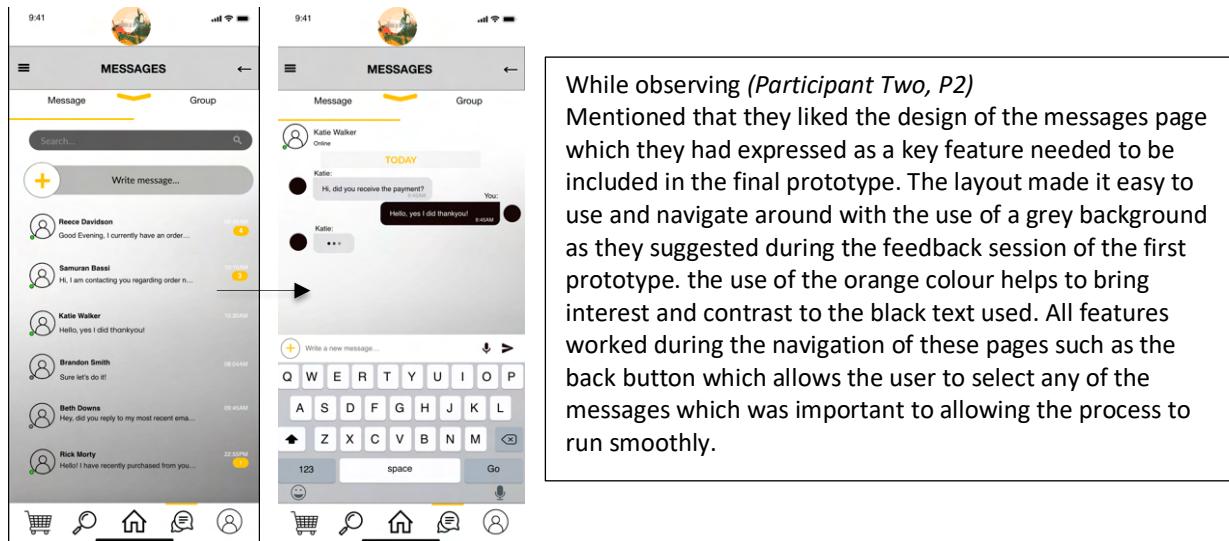


Figure 21. Evaluation of the final prototype (5)

**While observing (Participant One, P1)**

Mentioned that they liked the design of the 'my profile' page as the colour scheme used follows the same suit used throughout the prototype. They stated that they liked the use of icons to represent the different features available on the profile page but questioned the inclusion of 'my friends' as they weren't sure what this feature would offer.

**While observing (Participant Eight, P8)**

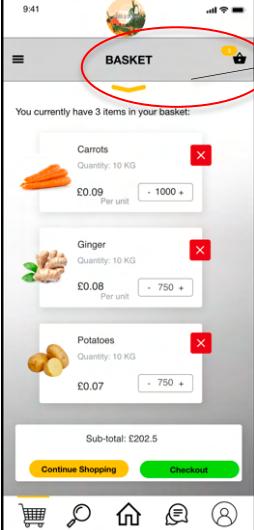
Stated they liked the organisation of the 'my profile page' and liked how the buyer version offered different services to the seller account which were tailored towards the necessary features a buyer would expect to use. The functionality of the application ran smoothly and helped with the ease of use as the user was able to access all features.

**(P1) Also mentioned that personal profile page had taken the feedback given from the static prototype into the final prototype and thought that the add image feature was better placed on this page.**

**(P5) took additional time reading through the 'upgrade page' included as a new feature within the 'my profile' page. They mentioned that they did not feel that it was a necessary requirement and that some of the features available through the paid service should be offered in the standard version. So if the prototype was meant to be implemented into an application this section would need some refinement to ensure users felt the feature was inclusive and entices them to spend money.**

Figure 22. Evaluation of the final prototype (6)

**(P2)** Mentioned that during the first prototype features were very crowded which made things hard to read and the flow of the prototype was hard to follow. However, they mentioned that the final prototype has taken onboard the feedback, making images and text bigger which makes it easier to read. The flow of the prototype is now a lot easier to follow and there is better use of the space.



**(P1)** Highlighted that they liked the clear icon and headings in the middle of each page to signify what page the user is on. The inclusion of the orange colour theme throughout the prototype adds to the professional feel of the prototype and this was a key feature expressed to me as feedback as being important to include.

**(P5)** Liked the organisation of the items in the basket, they are easy to view and edit if more products want to be added or decreased. As well as displaying the overall total clearly and giving the user instructions on what to do next allows for smooth transition between the different pages.

Figure 23. Evaluation of the final prototype (7)

**(P3)** Drew special mention to the app name and logo which they stated during the first prototype would look better relocated. They stated that the colour scheme used contrasts against the background and the new placement better suits the overall design of the prototype satisfying their preference.

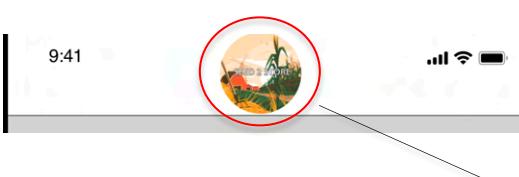
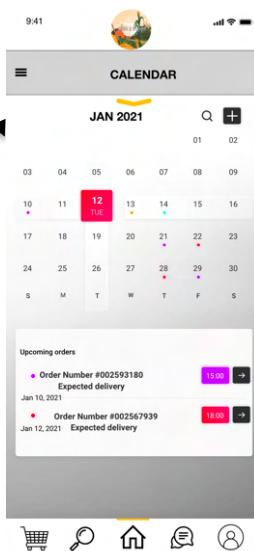


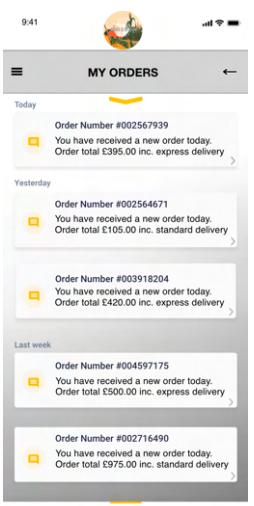

Figure 24. Evaluation of the final prototype (8)



**(P4)** Stated that the menu function was well designed and had been linked to every page they had navigated throughout with all the links relating to the relevant pages. It was an important feature which they specified as being imperative during the first design iteration. They mentioned how they liked the refinement and development from the static prototype as it only has the key features which were important for the user to be able to select quickly, aiding the overall usability of the application.



**(P4)** Spent several minutes engaging with the features available within the calendar feature. They described it as a well-designed section which was mentioned as an important feature to include. The navigation around the feature was easy to use and enjoyed the colour schemes used to signify different orders and dates.



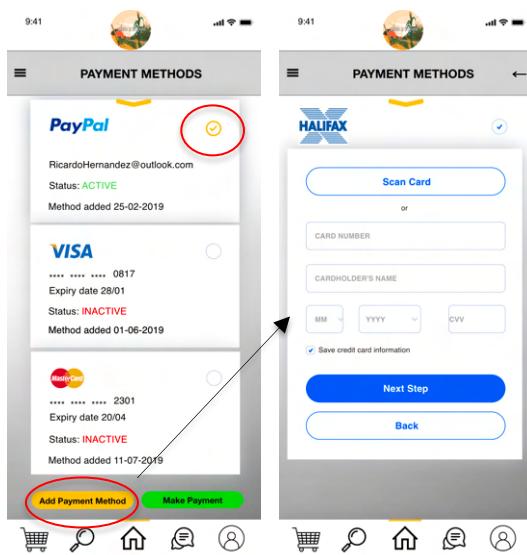
**(P8)** Mentioned that the design of my orders was very basic and lacked creativity. They stressed how important a filter or search function within this feature would be so that they can quickly access an order they would like to review. This was suggested as an improvement to implement when developing the application.

Figure 25. Evaluation of the final prototype (9)

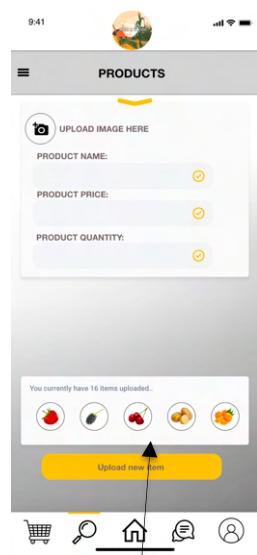


(P5) Stated they liked the evolution of the menu bar at the bottom from the inclusion of the orange colour suggested by other end users and the clear icons used to describe the function of each button was clear. They also said that it was well designed and was important that the icons did not change in size or move location from page to page which adds to the professional feel of the final prototype.

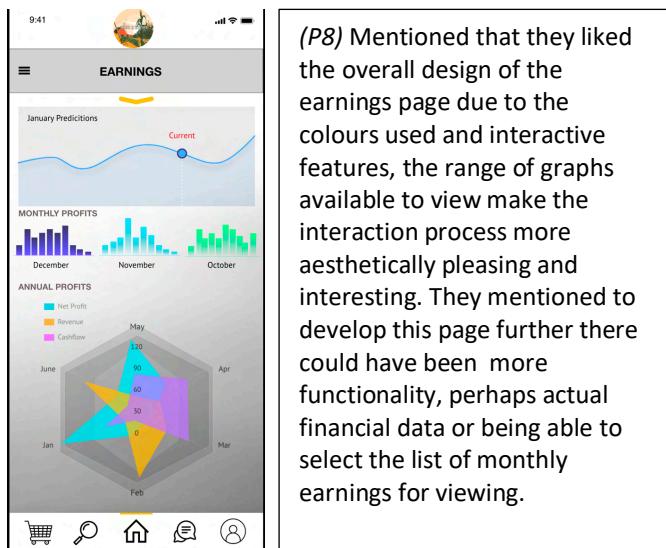
**Figure 26. Evaluation of the final prototype (10)**



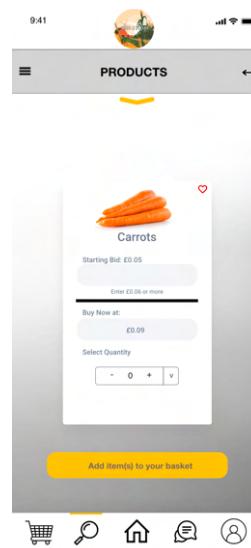
(P6) Mentioned that the payment method page were well designed. They said that it was easy to use and the full functionality transitioning between pages allows for fluent use. They specified that the 'status' and 'selection' button highlighted are key features to making the page an well designed and easy to use. They suggested that there could have been further functionality through a fully developed prototype to test if actual transactions can be placed in order to fully satisfy their demands.



**Figure 28. Evaluation of the final prototype (11)**



(P8) Mentioned that they liked the overall design of the earnings page due to the colours used and interactive features, the range of graphs available to view make the interaction process more aesthetically pleasing and interesting. They mentioned to develop this page further there could have been more functionality, perhaps actual financial data or being able to select the list of monthly earnings for viewing.



(P1) Mentioned that they liked the feature of having a preview of the items already uploaded onto your profile which you can click, and it will take you to that items page.

(P4) Mentioned the important feature for them was that you're able to see what the lowest bid on the item currently is and base your price upon that which means if the buyer accepts, you're likely to get a lower overall price. They explained this was an important feature to them.

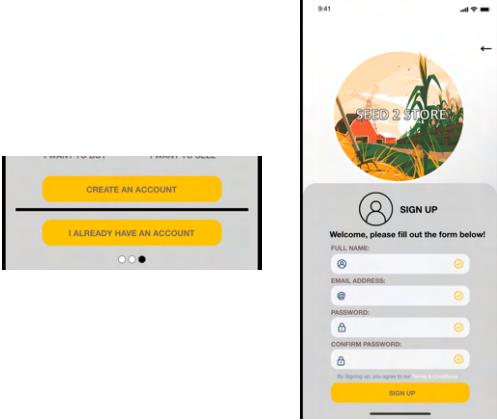
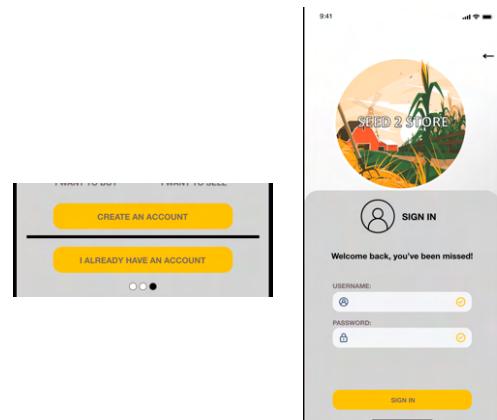
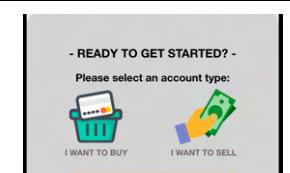
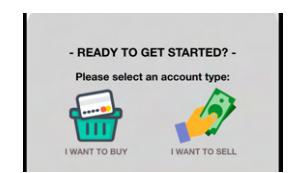
**Figure 27. Evaluation of the final prototype (12)**

#### 6.4 Meeting the Specification Requirement

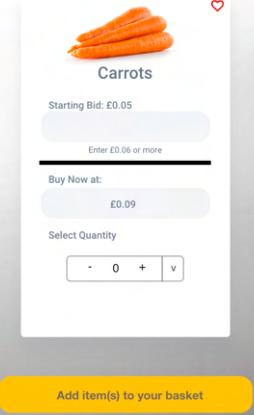
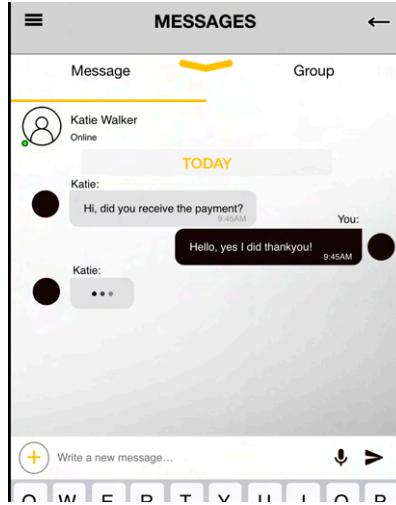
A measure of the suitability of the final prototype involved comparing the finish product against the specification requirement generated in the first design iteration. In the table below there are examples provided of where the specification point has been met or an explanation provided as to why the feature has not been included. As previously mentioned by the participants it is imperative that all specification points

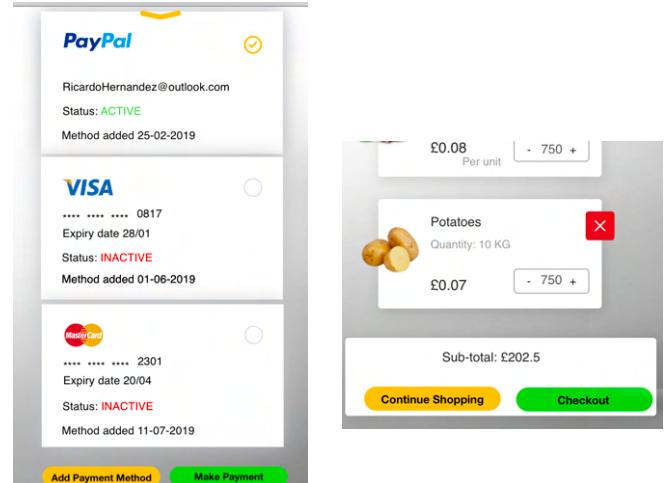
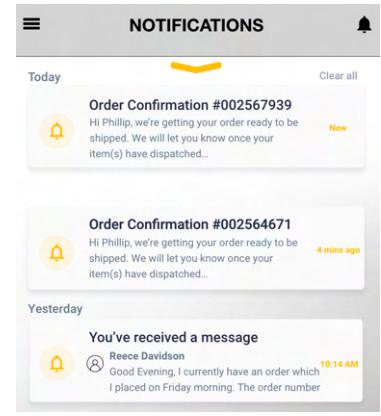
An investigation into the issues faced by both, subsidence and commercial farmers in Sub-Saharan Africa (SSA), as a consequence of western countries involvement

were met throughout each design iteration therefore, when comparing the first prototype against the final the participants are able to see the transition in design aspects and follow the evolution of the prototype in satisfying their needs.

ID	REQUIREMENT	HAS THE REQUIRMENT BEEN MET? (Yes/No)	EXAMPLE
1	The application must allow new users to sign up	Yes	
2	The application must allow existing users to log in	Yes	
3	The application must have a user selection choice for buyers	Yes	
4	The application must have a user selection choice for sellers	Yes	
5	The application must be fully functioning	Yes	

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as a consequence of western countries involvement

6	The application needs to be straight-forward & easy to use	Yes	An example of the final prototype meeting this specification point is expressed through the feedback given by the participants within the evaluation process.
7	The application must allow buyer to place auction bids on products	Yes	
8	The application must allow the seller to set lowest bid accepted per product	Yes	
8	The application must allow for direct communication between buyer & seller	Yes	
9	The application must calculate and display monthly statistics	Yes	

10	The application must facilitate purchase transactions	Yes	
11	The application must be able to send push notifications	Yes	
12	The application must use appropriate colour schemes and font styles & sizes	Yes	<p>An example of the final prototype meeting this specification point is expressed through the feedback given by the participants within the evaluation process.</p>

**Table 6. Meeting the specification requirements**

### **6.5 Meeting the Research Aim**

The research aim is ‘to produce a working prototype which, if implemented into a mobile application or an online website, will facilitate the buying and selling of commercially produced goods by both subsidence and commercial famers in SSA’. I believe that I have successfully met this research aim as I have fully designed and created the final prototype model I intended upon before the start of the design iterations. Through the evaluation process I have highlighted elements I feel that meet the specific needs of users and features of the design which can be further developed to aid the usability and overall design of the prototype.

## **CHAPTER SEVEN - CONCLUSIONS**

### **7.1 Introduction**

In this final chapter of the dissertation, I will compose a summary, reflecting upon all the accomplishments achieved during this project as well as drawing upon elements that did not go according to the original Gantt chart set. I will also present limitations of the composed solution and suggest future developments that could be implemented to further aid the project.

### **7.2 Project Management**

The most effective project management tool that I have used throughout this project was a Gantt chart. Through using this tool, it allowed me to gain a visual understanding of all the necessary tasks needed to be completed in order to finish the project which are displayed against the duration of the project from the start to the final submission date. The main benefit from using this tool, is the ability to manage the workload within the time I had effectively, as there were many tasks which overlapped, it was important to reference current progress against the Gantt chart which allowed me keep track and know what needed to be completed at certain points along the project.

### **7.3 Project Limitations**

There were several limitations I came across while undertaking this study. The first constraint was time, in relation to the start and end date, there was a lot of tasks to complete and a lot of variables which were external meaning I had no impact on how long they would take to complete. This meant that every task had to be completed within the time frame I had allocated to ensure I would finish the project in time and to the acceptable standard. Although I managed to successfully meet all research aims and objectives within the time frame set, I felt that I had not accurately estimated the duration and difficulty of certain tasks which meant that I was heavily under pressure with time drawing closer to the deadline.

Another limitation of the project was when conducting the evaluation of the final prototype it was difficult to fully gage a perspective of how the users body language and facial expressions helped to add depth of understanding of how the features were interpreted. As I had used the same online software, I used to compose the first set of interviews and focus groups, I feel that it did not fully reflect the expression of emotion and give me the depth of feedback I had anticipated. I feel that with better planning and without the constraints of COVID-19 I could have implemented eye tracking software which would have drawn more emphasis on certain aspects of the design which caught the attention of the user. Alternatively, I could have adopted an in-person approach which I could have better moderated, with more test queries specific to the kind of feedback I would want to draw.

Another limitation occurred during chapter three, where I had to compose 1-2-1 interviews and focus groups. The main issue was finding a common time where all participants were available to complete the focus group due to different time zones and the number of participants involved. While conducting the focus group I found

that some members of the focus group were vocally more dominating than less forthcoming individuals, which is challenging to moderate (Langford & McDonagh, 2002). This meant that the feedback received may have been unintentionally biased due to prompt given by me or influenced by the comments of other participants. While conducting the interviews online rather than in person I found the transcribing to be a longer and more difficult process to complete, this was not a factor I had considered and put further stress upon other aspects of the project as it had to be completed sequentially.

#### **7.4 Summary of Dissertation**

The aim of the dissertation was to produce a working prototype which, if implemented into a mobile application or an online website, will facilitate the buying and selling of commercially produced goods by both subsidence and commercial famers in SSA. The project was split up into 5 research objectives which were all successfully met by the completion of all 7 chapters of the dissertation study.

Objective Number	Research Objective	Objective met?	Evaluation
1	Perform extensive background research through examining academic journals and articles to extract information into the trading of agricultural produce between regions in SSA and UK, in attempt to gain an enhanced understanding of the problems faced by the parties involved.  Conducting research includes analysing existing services which offer international trade, in order to identify key features which, aids users in both buying and selling.	Yes Chapter 2	Objective 1 was met in chapter 2. I had completed a thorough investigation of existing literature and dissertation studies to gain knowledge on the current problems experienced by people in this region. By looking at the UK's 'middleman' act I was able to gage an understanding of their impact and how it was affecting the quality of business and life for agriculture farmers in SSA. By exhausting the range of sources available I felt fully equipped to tackle the design of a new system to eradicate many of the problems I had come across.
2	Identify & define the selected research methodology to be used through analysing the type of data needed to be collected. Research various data collection and analysis methods to conduct during this project, in order to accumulate relevant research participants and generate a design requirement specification, which will allow for a precise prototype to be created and evaluated with the end user for further development.	Yes Chapter 3	Objective 2 was met in chapter 3. I conducted an extensive search into data collection and analysis methods to select the approach which help me achieve the desired results. By following the selected methods step by step, I was able to cover all design aspects, creating a design specification and then into different prototyping methods.
3	Research a range of interview techniques, selecting a suitable method which is simple to perform and considers the proposed constraints	Yes Chapter 4	Objective 3 was met in chapter 4. I had conducted an extensive search into different interview techniques, revising how to conduct data analysis

	while also considering recruitment methods to select fitting participants to undertake the study. Conduct a series of interviews and focus groups in attempt to establish primary data which translates to both functional and non-functional aspects of each prototype.		and collection methods so that they could be performed with ease and precision while interacting with my participants. Through this stage of the project, I was able to create the design specification which covered all functional and non-functional requirements which translated to features included in the final prototype.
4	Implement the selected methodology approaches to design a static prototype (low-fidelity prototype, sketches & diagrams) which reflects the requirement specification developed and uses participant input as direction for design ideas. Develop the prototype from static to dynamic (high-fidelity prototype, web software prototyping) acting upon the feedback provided through the evaluation of the first prototype and conduct further analysis and evaluation of the final prototype solution.	Yes Chapter 4&5	Objective 4 was met in chapters 4&5. The first prototype I created was performed using the method stated in the objective, by involving the participant I was able to get detailed feedback and design ideas which would be important to include. In creating a static prototype, it enabled me to produce a final prototype which had incorporated features which had been specified during feedback and the second design iteration.
5	Perform a usability evaluation of the final prototype combining the method with a series of test queries, in order to evaluate the suitability of the final prototypes functional and non-functional features, this will show that the system can execute the intended specification requirements successfully.	Yes Chapter 6	Objective 5 was met in chapter 6. In chapter 6 I successfully performed the selected usability evaluation to assess the functional and non-functional features of the final prototype. The conclusions drawn allowed me to assess whether the product I had created was suitable for its built purpose and meeting the needs of the end user.

**Table 7. Meeting the research objectives**

### **7.5 Future Works**

In completing the project, I have gained a better understanding of ways to work more efficiently and how to best manage problems I come across quicker and easier, which would reduce the stress I am put under and increase the quality output. Reflecting upon the selected methodology approaches, I would have liked to start with a user-driven prototype before composing the static paper prototype. I believe in completing this method, it would have allowed me to gain a deeper understanding of exact features the participants would like to incorporate into the design as well as colour schemes and the placement of features. I feel that this method would have further suited the evolution of the final prototype as it would have both my ideas and

An investigation into the issues faced by both, subsidence and commercial farmers in Sub-Saharan Africa (SSA),  
as a consequence of western countries involvement

those presented by the end user which would have allowed me to meet the expectations of the end user a lot  
easier than the approach I opted to use.

Furthermore, If I had a longer duration to complete the project and a wider range of resources available, I  
would have liked to develop the prototype into a working application which I could have implemented through  
android studios. This software tool would have allowed the user to interact with the product I have created  
not only visually but presents them with a more hands-on interactive experience. The testing and evaluation of  
the final prototype would also have been more extensive as I could have performed black box testing and  
gained more informative and detailed feedback on how to better the solution created.

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## **APPENDICES**

### Appendix A      **REFLECTIONS**

#### **A.1 Project Reflection**

Upon reflection, selecting a suitable research question and topic area is very important. I feel that pre-existing knowledge within the topic area you're investigating is crucial as it will allow for further critical analysis of the data you already understand. Now knowing what completing a dissertation study entails, I believe the topic area I have chosen to be very interesting yet when conducting the literature review it was quite difficult to find specific data and information about large businesses due to the lack of publication of their involvement. I had underestimated the difficulty in which it would require me to obtain the information and I had not fully factored in how long it would take to gather, organise and present my findings. Although there are other elements of the project which went according to the plan, I believe my lack of useful time management did not ease the completion of the project, if I had carefully planned out aspects of the dissertation and followed the Gantt chart created more precisely then I believe I would have been able to achieve more effective results. The data I gathered and results that presented my findings did portray the magnitude of the involvement of western businesses, in a way which I had been ignorant towards. In completing the project, I now understand that the current measures in place will have a positive impact in aiding and providing support for millions of commercial farmers, while allowing many to take the transition from subsidence to commercial to earn a sustainable living and tackle many of the problems Sub-Saharan African countries face.

#### **A.2 Personal Reflection**

On a personal level, I am happy to say that I believe the project has been completed to the best of my ability factoring in the current complications of COVID-19. The adaptation of methodologies within the time frame given has allowed me to achieve the desired results which has led me to present the solution I have created. Although when I first started the project, I was extremely overwhelmed by the quantity of the content, I started off very slow and felt time continuously running out. However, once I began to follow the Gantt chart and deal with issues that occurred often better, I was able to push the pace and achieve the mini targets I had set each week. Although this was one of the few major projects I have worked on alone, I believe I have successfully met the aims and objectives while providing a high standard final product. If I was to complete this project again, I think that I would perform questionnaire's as I can dictate the type of data I would be collecting as well as increasing the quantity of participants in my study as I feel it would have provided me with a broader range of views and opinions to impact the way the final prototype was designed.

Appendix B      **METHODOLOGY LAYOUT**

**B.1    1-2-1 Interviews**

*All participants represent a UK target group*

(P6)	Participant 6	UK Grocery Supplier
(P7)	Participant 7	UK Grocery Supplier
(P8)	Participant 8	UK Grocery Retailer

**B.2    Focus Groups**

*All participants represent the SSA target group*

(P1)	Participant 1	Subsidence Farmer
(P2)	Participant 2	Subsidence Farmer
(P3)	Participant 3	Subsidence Farmer
(P4)	Participant 4	Commercial Farmer
(P5)	Participant 5	Commercial Farmer

Appendix C **PARTICIPANT DOCUMENTATION**

C.1 **Participant Information Sheet**

**PARTICIPANT INFORMATION SHEET**



**Brunel  
University  
London**

**Study title:** An investigation into the issues faced by both subsidence and commercial farmers in Sub-Saharan Africa (SSA) as a consequence of western countries involvement.

**Invitation Paragraph:**

I would like to formally invite you to participate in the collecting and conducting of my research study. It is imperative that you understand what will be asked of you so that you feel able and comfortable in undertaking this research process. Ensure you have taken enough time to read and acknowledge the following documentation carefully, this information will inform you what the research is about, why it is being conducted and what you will be asked to perform. Participation is voluntary, you are not obliged to participate and can ask to withdraw at any point during the process. If you have any questions or queries about the research study before making a decision, please do not hesitate to contact me personally so that I can address these issues. Thank you for taking the time to read this document

**What is the purpose of the study?**

The main purpose of my study is to provide the necessary, in-depth research dissertation for my undergraduate degree which I am studying at Brunel University London. While my project will focus upon the issues experienced in the field of agriculture by mainly farmers in LEDC's. I have chosen to focus on countries in Sub-Saharan Africa, where I feel the involvement of western parties have not fairly enabled or aided the development of this important occupation and industry. Currently there is a limited range of evidence highlighting the issues, therefore I require participants to come forward and share their experiences with me, which will then translate into requirements for creating a solution. From this research I aim to create a prototype, which will enable users to buy and sell their produce on. Through the application users can directly converse with consumers to build personal relations. On completion of my research, I aim to draw global attention to the main issues felt by the main parties involved and in doing so, attempt to attain a fair price for the products harvested gradually equating to a better quality of life. I am aiming to interview a sample size of 5-15 participants, who include subsidence farmers, commercial farmers located in regions in Sub-Saharan Africa, and UK retailers located in England. The recruitment process I will use is judgment sampling and snowballing sampling, this will allow me to gain access to farmers who are specific target audience.

**Why have been invited to participate?**

You have been invited to participate in the study as you identify as a person who fulfils the criteria of a current subsidence or commercial farmer in SSA and a current UK retailer. I feel that the information you can provide in relation to this study is imperative to its success. The collation of research aims to focus upon 10 different participants opinions and viewpoints which will enable me to draw conclusions and create a successful innovative solution.

**Do I have to take part?**

No, you do not have to participate as it is completely voluntary. The necessary ethical formalities have been followed to ensure complete safety and transparency throughout the conducting of the research study therefore, you can decide whether you wish to participate or not. If you do opt to continue you are given a copy of this information sheet, as well as all relevant policies and regulations regarding the collection of your data so you know what you will be asked to do and what will be done with your data. You can also choose to withdraw at any point during the study.

**What will happen to me if I take part?**

You will be asked to express your opinions and share personal experiences you have endured through an informal interview process, which will be approximately 15-30 minutes long and conducted using a range of online software services. There is a mixture of open and closed questions help address key areas of focus to enable me to create specific requirements for the product I will create. You are requested to take part in several question-and-answer sessions throughout the designing process, which will take place through the same interview process format, where I will ask you test my product and give feedback, your views will be presented anonymously unless you would like to be accredited if the document is published.

**What do I have to do?**

There are no explicit requirements which you have to do or be. The interview process will be conducted in free period which will not interrupt your normal lifestyle schedule.

**What are the possible disadvantages and risks of taking part?**

Reflecting upon personal experiences and speaking about them could potentially lead to a period of negative thoughts and memories which can be difficult to endure. Despite that, there are no other risks of taking part.

**What if something goes wrong?**

In the unlikely event that something happens, you may need to seek external aid or wish to contact the Brunel research ethics committee to raise your concerns and proceed through their complaints process. I will ensure that I follow all ethical guidelines and procedures to avoid anything potentially going wrong.

**Will my taking part in this study be kept confidential?**

The data collected will be anonymised, and participants will be called 'participant 1-10' rather than identified by names, appearances or characteristics. All information which will be collected will comply with the regulation policies ensuring confidentiality is attained.

**What will happen to the results of the research study?**

The results of the research study will be used to complete an undergraduate dissertation project, which will be completed on April 25<sup>th</sup>, 2021 and then information will be destroyed using appropriate methods to comply with the guidelines.

**Who is organising and funding the research?**

No funding necessary

**What are the indemnity arrangements?**

Brunel provides appropriate insurance cover for research which has received ethical approval.

**Who has reviewed the study?**

The research will be conducted by myself (Timothy Campbell) and overseen by my dissertation tutor and supervisor Professor Mark Perry.

**Contact for further information:**

**For general information-**

Researcher name: Timothy Campbell, Business Computing

Studies – Undergraduate. 1723427.

Supervisor name: Prof. M Perry, [Mark.Perry@brunel.ac.uk](mailto:Mark.Perry@brunel.ac.uk)

**For any formal complaints-**

Chair of the College Ethics Committee - Prof Hua Zhao [hua.zhao@brunel.ac.uk](mailto:hua.zhao@brunel.ac.uk)

**C.2    Participant Consent Form**

**CONSENT FORM**



**An investigation into the issues faced by both subsidence and commercial farmers in Sub-Saharan Africa (SSA) as a consequence of western countries involvement.**

MR T CAMPBELL

APPROVAL HAS BEEN GRANTED FOR THIS STUDY TO BE CARRIED OUT BETWEEN 17/02/2021 AND 26/03/2021

<b>The participant (or their legal representative) should complete the whole of this sheet.</b>		
	YES	NO
Have you read the Participant Information Sheet?	<input type="checkbox"/>	<input type="checkbox"/>
Have you had an opportunity to ask questions and discuss this study? (via email/phone for electronic surveys)	<input type="checkbox"/>	<input type="checkbox"/>
Have you received satisfactory answers to all your questions? (via email/phone for electronic surveys)	<input type="checkbox"/>	<input type="checkbox"/>
Who have you spoken to about the study?		
Do you understand that you will not be referred to by name in any report concerning this study?	<input type="checkbox"/>	<input type="checkbox"/>
Do you understand that:		
• You are free to withdraw from this study at any time	<input type="checkbox"/>	<input type="checkbox"/>
• You don't have to give any reason for withdrawing	<input type="checkbox"/>	<input type="checkbox"/>
• Choosing not to participate or withdrawing will not affect your rights?	<input type="checkbox"/>	<input type="checkbox"/>
• You can withdraw your data any time up to 28/02/2021	<input type="checkbox"/>	<input type="checkbox"/>
I agree to my interview being Choose an item.	<input type="checkbox"/>	<input type="checkbox"/>
I agree to the use of non-attributable quotes when the study is written up or published	<input type="checkbox"/>	<input type="checkbox"/>
The procedures regarding confidentiality have been explained to me	<input type="checkbox"/>	<input type="checkbox"/>
I agree that my anonymised data can be stored and shared with other researchers for use in future projects.	<input type="checkbox"/>	<input type="checkbox"/>
I agree to take part in this study.	<input type="checkbox"/>	<input type="checkbox"/>

Signature of research participant:	
Print name:	Date:
Witness Statement	
I am satisfied that the above-named has given informed consent.	
Witness signature:	
Print name:	Date:

**C.3    Participant Invitation**



Mr T. Campbell  
Undergraduate Study  
Brunel University London  
Kingston Lane  
Uxbridge UB8 3PH UK

05 April 2021  
1723427@Brunel.ac.uk

Dear who this letter may concern,

I am an undergraduate student, currently studying Business Computing at Brunel University London and I am conducting an investigative study for my undergraduate dissertation project. The reason for my letter is to ask you if my contact information could be passed onto your current retailers or suppliers so that I could ask them if they would be interested in participating in my study.

The study I am conducting is an investigation into the issues faced by both subsidence and commercial farmers in Sub-Saharan Africa (SSA) as a consequence of western countries involvement. The project I will undertake will focus upon the issues experienced in the field of agriculture, where I feel the involvement of UK businesses has had a major impact on this occupation.

During the course of the study, participants will be asked to conduct several interviews with myself, where I can gather data and information about processes and the degree to how much involvement there is and the magnitude of the impact on agriculture. Participation is completely voluntary. The necessary ethical formalities have been followed to ensure complete safety and transparency throughout the conducting of the research study therefore, you can decide whether you wish to participate or not. If you do opt to continue you are given a copy of an information sheet, as well as all relevant policies and regulations regarding the collection of your data so you know what you will be asked to do and what will be done with your data. You can also choose to withdraw at any point during the study.

Thank you for taking the time in reading my request and I look forward to hearing from you soon.

Your sincerely,  
Mr T Campbell

Appendix D **ETHICAL APPROVAL**

**D.1 Letter of Ethical Approval**



College of Engineering, Design and Physical Sciences Research Ethics Committee  
Brunel University London  
Kingston Lane  
Uxbridge  
UB8 3PH  
United Kingdom  
[www.brunel.ac.uk](http://www.brunel.ac.uk)

16 February 2021

**LETTER OF APPROVAL**

APPROVAL HAS BEEN GRANTED FOR THIS STUDY TO BE CARRIED OUT BETWEEN 17/02/2021 AN 26/03/2021

Applicant (s): Mr Tim Campbell

Project Title: An investigation into the issues faced by both subsidence and commercial farmers in Sub-Saharan Africa (SSA) as a consequence of western countries involvement.

Reference: 27643-LR-Feb/2021- 31249-3

Dear Mr Tim Campbell

The Research Ethics Committee has considered the above application recently submitted by you.

The Chair, acting under delegated authority has agreed that there is no objection on ethical grounds to the proposed study. Approval is given on the understanding that the conditions of approval set out below are followed:

- Approval is given for remote (online/telephone) research activity only. Face-to-face activity and/or travel will require approval by way of an amendment.
- The agreed protocol must be followed. Any changes to the protocol will require prior approval from the Committee by way of an application for an amendment.
- In addition to the above, please ensure that you monitor and adhere to all up-to-date local and national Government health advice for the duration of your project.

**Please note that:**

- Research Participant Information Sheets and (where relevant) flyers, posters, and consent forms should include a clear statement that research ethics approval has been obtained from the relevant Research Ethics Committee.
- The Research Participant Information Sheets should include a clear statement that queries should be directed, in the first instance, to the Supervisor (where relevant), or the researcher. Complaints, on the other hand, should be directed, in the first instance, to the Chair of the relevant Research Ethics Committee.
- Approval to proceed with the study is granted subject to receipt by the Committee of satisfactory responses to any conditions that may appear above, in addition to any subsequent changes to the protocol.
- The Research Ethics Committee reserves the right to sample and review documentation, including raw data, relevant to the study.
- You may not undertake any research activity if you are not a registered student of Brunel University or if you cease to become registered, including absence or temporary withdrawal. As a deregistered student you would not be insured to undertake research activity. Research activity includes the recruitment of participants, undertaking consent procedures and collection of data. Breach of this requirement constitutes research misconduct and is a disciplinary offence.

A handwritten signature in black ink, appearing to read "Hua Zhao".

Professor Hua Zhao

Chair of the College of Engineering, Design and Physical Sciences Research Ethics Committee

Brunel University London