PROJECT PROPOSAL

Project Title: "Enhancing Accessibility and Reliability of Handyman Services in Kenya: A Comprehensive Investigation"

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Course: Computing Research

Faculty: Computer Science

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Plagiarism Declaration

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Table of Contents

List of Figures

Abstract

The informal sector, constituting a significant portion of Kenya's workforce, faces challenges in the handyman services industry. Limited accessibility, uncertainty about service quality, and slow technology adoption hinder both clients and service providers, potentially leading to delayed maintenance and safety hazards. This research addresses these issues by proposing a mobile solution that leverages existing technologies to enhance the rapid location of handyman services. By bridging the accessibility gap and ensuring service quality, the proposed solution aims to improve overall efficiency and safety in Kenya's informal sector. This study explores the shortcomings of current technologies, examines variables influencing service procurement, and demonstrates the effectiveness of a mobile application in connecting consumers with reliable handyman services. Implementing such a solution contributes to economic development, job creation, and a safer environment in the informal sector. The Agile methodology will be employed for software development, and data will be collected through questionnaires

Chapter One

BACKGROUND

Handyman services fall under the informal sector category in Kenya. According to the Kenya National Bureau of Statistics, more than 83% of Kenya's working population is employed in the informal sector.(Okafor, 2023) Furthermore, several studies indicate a rapid increase in informal sector activities, which starkly contrasts with the decline in the formal sector. The high rate of growth in the informal sector results from increased rural-to-urban migration and the formal sector's inability to absorb the large number of job seekers in the country, leading to the creation of new job opportunities in the informal sector, such as handyman services.

The demand for handyman services in Kenya is influenced by several factors. According to a global analysis of the handyman services market (Bplans, 2015), one obvious factor is the rise in residential homes. There are two distinct market segments: homeowners and property managers. Homeowners often prefer to hire someone to take care of tasks because they lack the skills, time, or desire to tackle most jobs. Property managers, on the other hand, require handyman services to maintain a group of rental properties that need periodic upkeep.

Additionally, the technological revolution and the convenience of online/mobile platforms have fueled the demand for handyman services. However, despite the significant potential in the handyman service industry, there has been a delay in

technology adoption despite the global push toward digitalisation. Handyman services are essential but challenging to find because service providers are located in different

areas, offering varying costs, quality, and types of services. In cases of unexpected emergencies or unforeseen damage, immediate attention may be necessary, but it can be hindered by the difficulty of locating a handyman, potentially leading to calamities such as fires with severe consequences.(SMI, 2022)

Clients also face the challenge of determining the quality of services provided by handymen. The industry itself struggles with this issue as most clients heavily rely on reputation and word of mouth for business success.(finmodelslab.com, 2023)

This research aims to harness existing technology to create a mobile solution that facilitates the rapid and easy location of handyman services within specific areas, ensuring the fast delivery of quality services by handymen.

PROBLEM STATEMENT

In Kenya, the informal sector, particularly the handyman services industry, faces a myriad of challenges that hinder both clients and service providers. These challenges include limited accessibility to handyman services, uncertainties regarding service quality, and a delay in adopting technology for service delivery. These issues, if left unaddressed, can lead to delayed maintenance, emergency situations, and overall dissatisfaction among clients, thus impeding the sector's growth and potentially causing safety hazards.

This research seeks to explore these challenges comprehensively and develop a mobile solution to bridge the accessibility gap, ensure the quality of handyman services, and facilitate the integration of technology into the sector. By addressing

these issues, this research aims to improve the overall efficiency, safety, and accessibility of handyman services in Kenya's informal sector, contributing to the country's economic development and job creation.

RESEARCH OBJECTIVES

1. To assess the shortcomings of existing technologies employed in the search for handyman services.
2. To examine the variables influencing the procurement of handyman services.
3. To demonstrate the efficiency of a mobile application in linking consumers with handyman services that align with their preferences.

RESEARCH QUESTIONS

1. What are the current technologies or methods used by clients to search for handyman services in Kenya's informal sector?
2. What are the limitations and shortcomings of these existing technologies or methods in terms of accessibility, accuracy, and efficiency?
3. How do clients and service providers perceive the effectiveness of these technologies in matching demand with supply for handyman services?
4. How can a mobile application be designed to connect clients with available handymen in specific geographical areas effectively?

5. What features and functionalities should the mobile application include to improve the efficiency of matching clients with suitable handyman services?
6. What are the perceived benefits of using a mobile application for both clients and service providers in terms of convenience, speed, and transparency?

CONTENT SCOPE

The research encompasses a comprehensive content scope organized into five key steps. First, it delves into the investigation of current technologies and methods employed by clients when seeking handyman services within Kenya's informal sector. This involves identifying the prevalent tools and platforms relied upon for service searches. The second step involves a critical analysis of the limitations and drawbacks inherent in these existing methods, with a focus on factors such as accessibility, accuracy, and efficiency. The examination extends to understanding the broader impacts of these limitations on both clients and service providers within the handyman services industry. The third step involves delving into the perceptions of effectiveness held by clients and service providers concerning the current technologies in place for matching service demand with supply. This exploration seeks to uncover the challenges faced and satisfaction levels experienced by stakeholders in relation to the current methods for finding and providing handyman services. In the fourth step, the research shifts towards investigating the design principles of a mobile application tailored to connect clients with available handymen in specific geographical areas efficiently. This includes the identification of crucial functionalities and features necessary to address the previously identified challenges. Finally, the fifth step involves evaluating the perceived benefits of utilizing such a

mobile application for both clients and service providers, focusing on aspects such as convenience, speed, and transparency. Additionally, the research explores how the integration of technology into the handyman services sector can enhance overall efficiency and safety within the industry.

GEOGRAPHICAL SCOPE

The geographical scope of this research primarily encompasses Kenya. The study will focus on the informal sector of handyman services within the country. Specific regions, cities, or areas within Kenya may be selected for in-depth analysis to ensure the findings are representative of the broader context. However, the research's primary focus will be on the Kenyan market and its unique challenges and opportunities.

CONTEXT SCOPE

These steps focus on understanding the current landscape of handyman services in Kenya's informal sector, including the demand factors, existing technologies, and challenges faced by clients and service providers. These steps delve into the development and potential implementation of a mobile application tailored to the Kenyan context, aiming to address the identified challenges and improve service accessibility.

SIGNIFICANCE OF STUDY

This study holds significant importance for Kenya's informal sector, particularly the handyman services industry. With 83% of the population employed in this sector, its growth and development are crucial for economic stability. By tackling issues such as limited accessibility, uncertainties about service quality, and the delay in technology adoption, this research aims to not only enhance job opportunities but also improve safety and well-being. The integration of technology through a mobile application has the potential to modernize the sector, providing clients with convenience and immediate access to services. Furthermore, this research offers data-driven solutions that can guide policymakers and stakeholders, setting a precedent for addressing challenges in the informal sector. Ultimately, this study has broader implications for similar industries within Kenya and beyond, making it a significant endeavour with the potential to drive economic growth, enhance safety, and promote innovation.

Chapter Two

INTRODUCTION

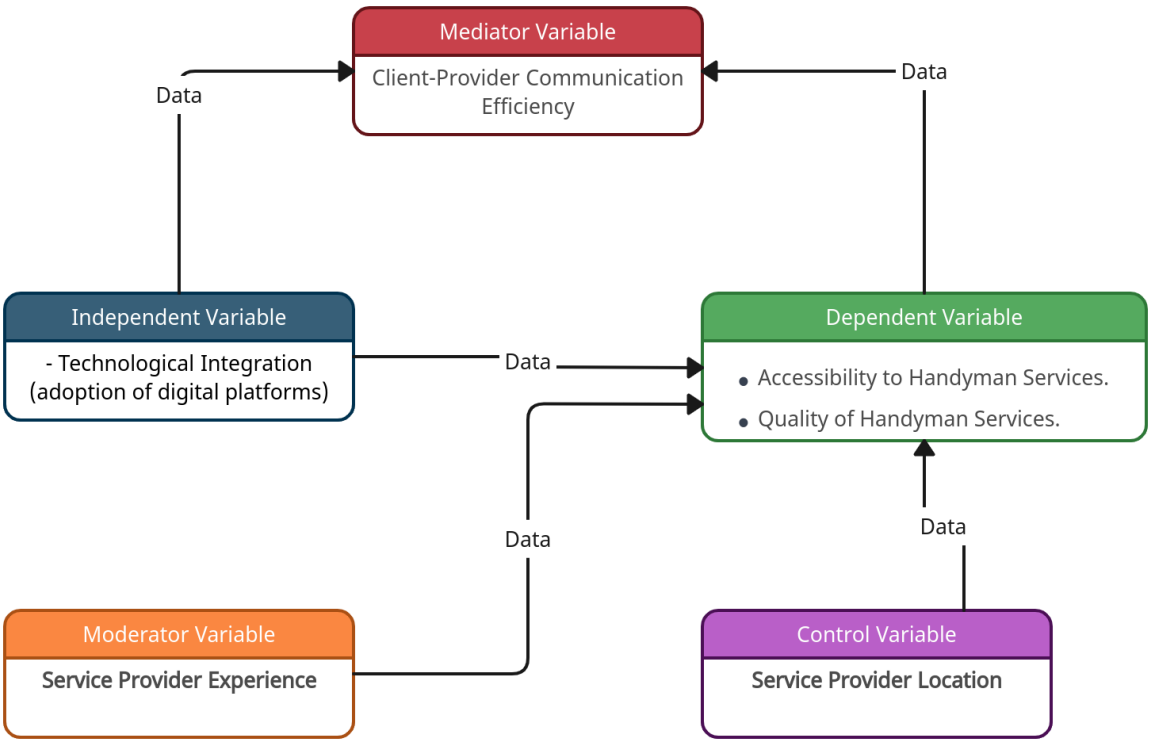
The informal economy is heavily relied upon by the majority of workers in Africa, with a staggering 85.8% of them engaging in this sector. In countries such as the DRC, Kenya, Tanzania, Ethiopia, and Zimbabwe, the proportion of informal employment reaches as high as 90% and above, while it ranges from 75% to 89% in Malawi and Zambia. Handyman services are commonly associated with minor maintenance tasks, including repairing furniture, installing shelves and curtains, hanging artwork, changing lighting fixtures, and various other handyman-related tasks. In Kenya, these services are classified as part of the informal sector. Despite the increasing use of technology in various industries across Africa, the informal sector has not effectively embraced its potential. According to a study conducted by the World Bank, only 2% of micro-sized businesses owned by young women and 8% of micro-businesses owned by men make use of technology.

The informal sector in Kenya plays a pivotal role in the country's economy, with over 83% of the working population employed in this sector. One notable segment of the informal sector is the handyman services industry. However, this industry faces a number of challenges, including limited accessibility to services, uncertainties about service quality, and a delay in adopting technology for service delivery. These challenges hinder the industry's growth and pose safety hazards.

This literature review investigates studies made about technology integration in the informal sector and how technological integration can improve handyman services in Kenya. It also critically analyzes the limitations and drawbacks of these existing methods, with a focus on accessibility, accuracy, and efficiency. The review also

explores the perceptions of effectiveness held by clients and service providers concerning the current technologies in place for matching service demand with supply by applying the theoretical framework. This research is important for Kenya's informal sector, particularly the handyman services industry, as it has the potential to enhance job opportunities, improve safety, and promote economic well-being. The integration of technology through a mobile or web application can modernize the sector and provide clients with convenience and immediate access to services. The research also offers data-driven solutions that can guide policymakers and stakeholders, setting a precedent for addressing challenges in the informal sector. Ultimately, this study has broader implications for similar industries within Kenya and beyond, making it a significant endeavour with the potential to drive economic growth, enhance safety, and promote innovation.

CONCEPTUAL FRAMEWORK



HYPOTHESES

- The adoption of technological integration suggests that using digital platforms makes it easier to get handyman services, which has a good impact on accessibility.
- The quality of services provided by handymen is positively influenced by implementing technological integration. If digital platforms are used, the level of quality of service providers improves.
- The communication between the client and the provider positively influences both the accessibility to and quality of handyman services.

- The experience of the service provider moderates the relationship between the technological integration and the quality of the handyman services; if the experience of the service provider is better, then the quality of service is stronger.

THEORETICAL REVIEW

In many countries worldwide, there has been a noticeable surge in the demand for handyman services. This increase can be attributed to various factors, including local requirements, market dynamics, the ownership of second homes, and the need to maintain commercial properties. As people's lives have become busier, there is a growing demand for assistance with various household tasks, such as installing light fixtures or assembling shelves. However, the existing solutions designed to address the availability of handyman services are scattered. Contact information for handymen is dispersed across the internet, and there is no organised system for determining their locations or assessing the quality of services they provide.(Shibwabo & Gikundi, 2017) Below, we provide a review of some of the technologies that people have used to get connected to handyman services.

Location-Based Mobile Services

In Kenya, as in many parts of the world, the demand for handyman services has been on the rise. Several factors contribute to this surge in demand, including local needs, market dynamics, the ownership of second homes, and the maintenance of commercial properties. The modern lifestyle, characterised by increasingly busy routines, has led to more people seeking assistance with various odd jobs in and around their homes, such as changing light fixtures or installing shelves. However, addressing this demand for handyman services has presented challenges, primarily due to the fragmented nature of existing solutions. Often, individuals looking for

handyman services find themselves sifting through scattered contacts on the internet, lacking a streamlined mechanism to assess the location and quality of services offered by these handymen.

To bridge this gap, many people in Kenya turn to location-based mobile services, a technology that has become an integral part of our lives. Location-based mobile services refer to the use of mobile devices to provide users with location-specific information. An excellent example of such services is the widely popular Google Maps. The functionality of mobile location-based services involves various components, including location-based services software, content providers that supply geographic-specific information, the end user's mobile device, a positioning component for determining the user's location, and a mobile network for transmitting data.

In Kenya, individuals seeking handyman services leverage mobile location-based services, particularly Google Maps, to streamline their search for service providers. The process typically involves the following steps:

1. Opening Google Maps: Users begin by launching the Google Maps mobile application on their smartphones. The application utilizes the device's GPS capabilities to pinpoint the user's exact location.

2. Searching for Handyman Services: Once on Google Maps, users enter specific search terms into the search bar. To find handyman services, they can use keywords

like "handyman services," "repair services," or descriptions of the specific handyman tasks they require.

3. Exploring Nearby Service Providers: Google Maps presents users with a map centered on their current location. Users can explore this map, zoom in, and discover nearby handyman service providers, marked with pins or markers.

4. Accessing Service Provider Details: By selecting a pin or marker on the map, users can access comprehensive information about the handyman service provider. This information often includes the provider's name, contact details, user reviews and ratings, the range of services offered, and directions to their location.

5. Contacting or Navigating:Users can easily get in touch with the chosen handyman service provider through the contact information provided in the application. Additionally, Google Maps can provide step-by-step directions to the provider's location, simplifying the process of reaching their services.

6. User Reviews and Ratings: Google Maps typically includes user-generated reviews and ratings for the listed service providers. This feature empowers users to make informed decisions based on the experiences of others who have utilized these handyman services.

7. Checking Availability: Users can also review handyman service providers' availability, business hours, and any special promotions or discounts, if applicable.

8. Booking or Requesting Services: Depending on the specific service provider, users may have the option to directly book or request handyman services through Google Maps, further streamlining the entire process.

The use of mobile location-based services, exemplified by Google Maps, has become an integral part of the handyman service-seeking process in Kenya. This technology provides real-time, location-specific information, enabling users to make informed decisions tailored to their specific needs. As a result, it streamlines the process of locating and connecting with handyman service providers, ultimately enhancing accessibility and the overall user experience.

The popularity and widespread usage of Google Maps and similar applications in Kenya underscore the significance of this technology in improving access to essential services like handyman services. This highlights the growing reliance on technology to address the demands of our fast-paced lives and reinforces the importance of mobile location-based services in today's service-seeking landscape.

REVIEW OF RELATED EMPIRICAL THEORIES

The information systems literature extensively explores the adoption and utilisation of technology, both by individuals and organizations. This empirical theory review aims to delve into the examination of models and concepts applied in the context of location-based mobile services. Among the most commonly used technology adoption models are the "Technology Acceptance Model" (Davis et al., 1989), the "Innovation Diffusion Theory" (Rogers, 1995), and the "Social Cognitive Theory" (Compeau and Higgins, 1995). In 2003, Venkatesh et al. integrated these models and introduced the "Unified Theory of Acceptance and Use of Technology" (UTAUT). UTAUT identifies key factors in technology acceptance and behaviour, including performance expectancy, effort expectancy, and social influence, as well as facilitating conditions.

Adopting UTAUT as the foundational theoretical model for studying the adoption of location-based services (LBS), we apply performance expectancy to represent the perceived usefulness of using LBS and effort expectancy to signify the learning cost associated with using LBS. According to Venkatesh et al. (2003), facilitating conditions relate to an individual's belief in the existence of an organizational and technical infrastructure that supports the use of the system. In essence, facilitating conditions address the technological and organizational environment aspects designed to remove barriers to use. However, it's important to note that the concept of privacy concerns stands in contrast to facilitating conditions. In the context of LBS, privacy concerns have been identified as a significant obstacle to the adoption of such services (Gupta et al., 2011).

GAP IN KNOWLEDGE AND CONTRIBUTION TO KNOWLEDGE

Location-Based Services (LBS) have witnessed significant growth and evolution over the years, with a wide array of applications spanning outdoor and indoor environments. However, several limitations continue to shape the landscape of LBS and pose challenges for their widespread adoption and development. This literature review explores these limitations, as highlighted in the article "Current Trends and Challenges in Location-Based Services" by Haosheng Huang and Georg Gartner.

A review of Location Based Mobile services to get connected with handyman services has that currently it does not capture all the information needed for both the seekers and the providers. The location-based service provides, the location of providers but does not guarantee the trust and quality to be provided by the handymen.(Ogunrinde et al., 2023)

One of the primary limitations of LBS is the challenge of indoor positioning. While global navigation satellite systems like GPS are highly effective in outdoor settings, they struggle to provide accurate and reliable positioning information indoors or in densely populated urban areas. This limitation inhibits the full potential of LBS in a variety of indoor applications, including navigation within shopping malls, museums,

and airports. Researchers and developers are actively working to overcome this obstacle and enhance the indoor positioning capabilities of LBS.(Moore et al., n.d.)

Privacy concerns represent another significant limitation of LBS. As these services become more integrated into daily life, users and privacy advocates are increasingly concerned about the collection and use of location data. Users worry about the potential misuse or unauthorized access to their location information, raising ethical and legal questions. Addressing these privacy concerns is essential to building trust among users and ensuring responsible handling of location data in LBS applications.(Moore et al., n.d.)

Furthermore, the evolving nature of LBS, expanding beyond navigation and wayfinding to diverse applications such as social networking, entertainment, healthcare, and education, necessitates interdisciplinary research collaboration. The integration of geospatial science, information and communication technology (ICT), and social sciences is crucial for making LBS more context-aware, user-friendly, and adaptable to evolving societal needs. While interdisciplinary research promises innovation, it also presents challenges in terms of coordination and knowledge sharing among experts from different fields.(Moore et al., n.d.)

To bridge the gap in the location-based services (LBS) landscape, the envisioned mobile application is designed as a centralized platform. The proposed solution is envisioned as a centralized hub that not only offers a comprehensive array of location-based services (LBS) but also integrates additional features to foster meaningful interactions between seekers and providers. Serving as a one-stop destination for users seeking LBS, it promises to bridge the gap between outdoor and

indoor positioning and will provide precise location information regardless of the environment. Beyond the core LBS offerings, the application aims to enhance user interactions by incorporating user profiles, service listings, and communication tools, facilitating real-time connections between service seekers and providers. Users will access detailed service descriptions, provider profiles, and user-generated content, ensuring they make informed choices when selecting LBS providers. The app is committed to regular updates and maintenance, guaranteeing users access to the latest geographic data and a dependable platform. In addition, personalized experiences, stringent privacy controls, and transparent data management policies are integral aspects, aimed at making LBS interactions user-centric and secure.

SUMMARY OF LITERATURE REVIEW

The literature review delves into the critical topic of technology integration within the informal economy, with a specific focus on the handyman services sector in Kenya. It highlights the substantial reliance on the informal economy in Africa, where the majority of workers engage in this sector. However, despite the growing use of technology in various industries, the informal sector, particularly handyman services, has been slow to embrace its potential.

This review seeks to investigate the integration of technology in the informal sector and how it can improve accessibility, accuracy, and efficiency in handyman services. It emphasizes the need for a centralized platform to bridge the gap in location-based services (LBS), serving as a one-stop destination for both service seekers and

providers. The application is envisioned to provide users with accurate and up-to-date LBS, regardless of their environmental challenges.

The conceptual framework presents four hypotheses that suggest technology adoption in handyman services positively impacts accessibility and service quality, with the experience of the service provider moderating this relationship. The theoretical review outlines the increasing demand for handyman services in Kenya and the use of location-based mobile services, such as Google Maps, to streamline service searches.

The review of related empirical theories introduces the Unified Theory of Acceptance and Use of Technology (UTAUT) as a foundational model for studying technology adoption. It highlights the significance of privacy concerns in the context of location-based services.

Identifying gaps in knowledge, the review notes challenges in indoor positioning, privacy concerns, and the need for interdisciplinary research collaboration in the LBS field. To address these limitations, the proposed mobile application is described as a centralized platform offering comprehensive LBS. It promises to provide precise location information, detailed service descriptions, and communication tools for seamless interactions between seekers and providers. The application also commits to regular updates, personalized experiences, privacy controls, and transparent data management policies.

In summary, the literature review underscores the importance of technology integration in the informal economy, particularly in the handyman services industry in

Kenya. It identifies existing challenges and limitations and proposes a comprehensive mobile application as a solution to bridge the gap in location-based services. This research has the potential to drive economic growth, enhance safety, and promote innovation in Kenya and similar industries worldwide.

Chapter Three

RESEARCH METHODOLOGY

The aim of this research is to address the critical issues within Kenya's informal sector, focusing on the handyman services industry. With over 83% of Kenya's workforce employed in the informal sector, it becomes imperative to analyze and innovate within this space to enhance accessibility, quality, and the integration of technology. In light of this, the research question is framed as follows:

Research Problem/Question: How can we leverage technology to improve the accessibility and quality of handyman services in Kenya's informal sector?

This research necessitates a methodical approach to investigate the existing challenges and subsequently design a mobile application tailored to the Kenyan context for connecting clients with available handymen effectively. To address this problem and answer this question, an appropriate methodology specific to computer science is essential to facilitate solution formation and testing.

In computer science, the choice of methodology is pivotal for effective research. Given the nature of this study, which involves technology development and evaluation, we propose the use of the "Agile Development Methodology." Agile methodology is well-suited to software and application development, as it emphasises iterative development, customer collaboration, and rapid responsiveness to change. It allows for a dynamic and flexible approach to application development, ensuring that the final product aligns with user needs and preferences.

OVERVIEW OF THE METHODOLOGY: AGILE DEVELOPMENT

The Agile methodology encompasses several key principles and practices, including:

1. User-Centric Approach: Agile development places a strong emphasis on understanding the end-users needs and preferences. This aligns with the aim of our research, which is to create a mobile application that effectively serves the clientele of the handyman services sector in Kenya.

2. Iterative Development: Agile promotes the creation of a Minimum Viable Product (MVP) that can be continually improved upon. This iterative approach allows us to develop, test, and refine the mobile application incrementally, ensuring that it meets user expectations.

3. Cross-Functional Teams: Agile methodology encourages multidisciplinary teams, which include developers, designers, and domain experts. This collaboration is essential for designing and implementing a robust and user-friendly mobile application.

By implementing the Agile methodology, this research aims to create a mobile application that addresses the accessibility and quality issues within Kenya's informal handyman services sector. The iterative and user-centric approach will ensure that the application is optimized for the Kenyan market, meeting the specific demands of both clients and service providers.

The following sections of this research methodology will delve into the specific steps and procedures involved in applying the Agile methodology, including user research, prototyping, development, testing, and continuous improvement, ultimately leading to the creation of the mobile application tailored to Kenya's handyman services sector.

PROJECT INITIATION AND PLANNING PHASE

The Project Initiation and Planning Phase serves as the foundational step in the research methodology for improving handyman services in Kenya's informal sector through a mobile application. It involves defining the scope, objectives, and goals of the project, with a clear focus on enhancing accessibility and service quality. Additionally, this phase includes stakeholder identification and team assembly, ensuring that a cross-functional project team is in place. A product backlog is developed to outline the features and functionalities to be created in subsequent phases, with prioritization based on their alignment with project objectives. Time estimation, risk assessment, budget planning, and ethical considerations are addressed comprehensively to create a robust plan for the research. This phase sets the groundwork for subsequent research activities, including user research, application development, and continuous improvement.

USER RESEARCH AND REQUIREMENT GATHERING

The User Research and Requirements Gathering phase represents a pivotal step in our research methodology. Its primary objective is to gain profound insights into the needs, preferences, and pain points of both customers and handyman service providers within Kenya's informal sector. The research aims to meticulously analyze a comprehensive list of functional, nonfunctional, and technical requirements essential for determining the feasibility of developing the system.

METHOD OF DATA COLLECTION

Sources of Data:

The data for this research will be primarily derived from two sources:

- **Primary Data:** This will be collected through surveys administered to clients who use handyman services in Nairobi and Kiambu. The survey will be conducted using a well-structured questionnaire specifically designed for this study. The questionnaire will consist of both closed-ended questions (with fixed response options) and open-ended questions (allowing participants to provide detailed responses). The primary data gathered from the surveys will provide insights into user perspectives and experiences with handyman services.

- **Secondary Data:** In addition to primary data, this research will leverage secondary data from reputable sources such as Kaggle and Google Dataset Search. These datasets will offer a broader perspective on the potential impact of mobile technology on the handyman services sector, covering both customer and handyman viewpoints.
- **Questionnaire Construction**The questionnaire will be carefully constructed to ensure it aligns with the research objectives and questions. The closed-ended questions will cover topics such as user preferences, challenges, and satisfaction levels with existing handyman services. Open-ended questions will delve deeper into specific issues and allow participants to express their views in detail. The questionnaire will be pretested to identify any ambiguities or issues with question wording and will be refined based on feedback from a small sample of potential respondents.

- **Validation**

  The questionnaire will undergo validation to ensure it accurately captures the information required for the research. Validation will involve reviewing the questions for relevance, clarity, and consistency with the research objectives. Experts in the field may be consulted to validate the questionnaire's content.

- **Distribution**

  Once the questionnaire is finalized and validated, it will be distributed to the target population of clients using handyman services in Nairobi and Kiambu. This distribution may involve various methods, including online surveys, in-person

interviews, or telephone interviews, depending on the accessibility and preferences of the respondents.

➢ **Retrieval**

Completed questionnaires will be collected from the participants through the chosen distribution channels. Data retrieval may also include online submissions through survey platforms or data entry from paper questionnaires.

➢ **Collation**

All collected data will be collated, organized, and prepared for analysis. This process involves data cleaning to address any errors, missing values, or inconsistencies. Data from both closed-ended and open-ended questions will be compiled and structured for analysis.

➢ **Presentation and Interpretation of Data**

The data will be presented using various techniques, including tables, charts, and graphs, to facilitate a clear and comprehensive understanding of the findings. The interpretation of data will involve analyzing the responses to closed-ended questions using statistical methods, while open-ended responses will be qualitatively analyzed

to extract insights and themes. The interpretation of data will ultimately lead to conclusions, recommendations, and insights that address the research objectives.

LOCATION OF STUDY

The choice of study locations in Nairobi and Kiambu, Kenya, is strategically significant due to several compelling factors. Firstly, both Nairobi and Kiambu are densely populated areas, making them representative of urban centres in the country. Nairobi, as the capital city, is not only the largest urban center but also a major economic hub with a diverse population engaged in various industries and services, including the informal sector, where handyman services are prevalent. Kiambu, an adjacent region to Nairobi, shares similar urban dynamics, serving as a commuter zone for individuals working in Nairobi. Therefore, these areas offer a microcosm of the broader Kenyan context, making research findings applicable to a substantial portion of the population.

Furthermore, the substantial mobile penetration rate of 67% in these areas is a crucial factor. In an era of digital transformation and the planned development of a mobile application for the efficient location of handyman services, selecting locations with a high mobile phone presence is not only strategic but also pragmatic. This high mobile penetration rate enhances the feasibility of implementing the proposed mobile solution, ensuring its accessibility and potential impact on a significant portion of the target population.

TARGET POPULATION

The total target population of 100 people for this research comprises clients in Nairobi and Kiambu, Kenya, who utilise various handyman services, including but not limited to plumbing, electrical appliance repair, and a range of other services offered in the informal sector. This group of clients represents individuals and households seeking assistance with maintenance and repairs in their homes or properties. By focusing on this specific target population, the research aims to gain insights into the experiences, needs, and preferences of the end-users of handyman services. This understanding is essential for the development of a mobile application that can effectively bridge the accessibility gap and ensure the fast delivery of quality services, ultimately enhancing the overall efficiency and satisfaction of clients in the informal sector.

SAMPLING TECHNIQUE

In this study, we employed a robust and systematic sampling approach known as random sampling, targeting 30 participants. This sample size was deemed appropriate to achieve the study's objectives effectively. The decision to reduce the sample size from 100 to 30 was based on:

- Resource limitation
    - Conducting in-depth interviews and gathering qualitative data from a large sample can be resource-intensive in terms of time and financial resources.
- Data quality
    - A small sample size ensures that quality and sufficient data meet the research objectives.

This method ensures the selection of survey participants from the population of clients using handyman services in Nairobi and Kiambu in an entirely unbiased and random manner. Through the application of random sampling, each individual within the target population has an equal opportunity to be included in the sample, enhancing the overall representativeness of the study.

The utilisation of random sampling is crucial for generating findings that accurately reflect the diverse clientele of handyman services. This approach contributes to the research's validity and reliability and ensures that the study's conclusions are meaningful and applicable. By adhering to the principles of random sampling, our goal is to make informed recommendations that can positively impact the improvement of accessibility and service quality within Kenya's informal handyman sector. This study aims to play a pivotal role in contributing to the advancement of the industry and facilitating positive changes based on comprehensive and unbiased research.

DATA ANALYSIS

To advance the accessibility and quality of handyman services in Kenya's informal sector through a dedicated mobile application, two crucial data analyses—Descriptive Analysis and User Behavior Analysis—have been undertaken to establish a foundational understanding of the existing landscape. The Descriptive Analysis summarises demographic information extracted from survey responses, portraying an insightful overview of the population's age distribution, income levels, and frequency of engaging with handyman services. Concurrently, User Behavior Analysis delves

into user preferences, challenges, and satisfaction levels, employing statistical methods to discern behavioural patterns such as peak service times and the correlation between user satisfaction and service frequency. These analyses lay the groundwork for informed decision-making and strategic development as the research progresses toward the iterative stages of application design and implementation. The subsequent phases of this study will build upon these analyses, aiming to refine the mobile application and optimise its features to align seamlessly with the identified user needs and preferences within the Kenyan context.

DESIGN PHASE

In this phase, I will define the technical details of the product. This phase will determine the software and hardware architecture of the software products to ensure that the requirements are satisfied.

The following UML diagrams will be used to design the system:

- **Use case Diagram**

In the following section, a visual representation of the interactions and relationships between different actors and use cases within the application will designed.

This use case diagram highlights the key interactions and functionalities of the handyman services system, with descriptions clarifying the purpose of each use case. It simplifies the understanding of how clients, handymen, and administrators engage with the system.

➢ **Database Design**

The Entity-Relationship Diagram (ERD) plays a pivotal role in shaping the database design. This phase involves the meticulous definition of various elements, including tables representing essential entities like clients, jobs, and handymen, and their associated attributes. Furthermore, the relationships between these entities are established to define how they interconnect and interact within the database. Additionally, the ERD helps identify dependent and independent entities, facilitating the creation of derived attributes during the database design process. This comprehensive approach ensures a well-structured and efficient database that aligns seamlessly with the system's requirements.

➢ **Wireframes**

The application wireframes will be created using Figma, a powerful design tool. These wireframes will serve as visual blueprints, allowing us to envision the user interface's appearance and layout post-development vividly.

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Appendix

https://forms.gle/m2cLn4JCBWj9exot6