



MENTAL HEALTH WELLNESS WEB PORTAL FOR  
UNIVERSITY STUDENTS AND PEER COUNSELLORS  
IN KENYATTA UNIVERSITY.

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This proposal has been submitted in partial fulfilment of the requirements for the award of the degree in Bachelor of Science in Computer Science in the school of Engineering and architecture

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## DECLARATION

I declare that this project is a product of my original research and creation and it has not been presented by any other individual for any other degree or award in any other institution.

Charles Ruita

J17/MNU/7005/2019

Signature:

Date:

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I confirm that the work reported in this proposal was carried out by the candidate under my supervision.

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Date:

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## ACKNOWLEDGEMENT

I would like to express my gratitude to all the individuals who have contributed to the development of this proposal for a mental health wellness application. First and foremost, I would like to thank my supervisor, Dr. Waithaka and Madam Emma, for the support and guidance throughout this project phase. Additionally, I would like to thank the various lecturers from the department who have been instrumental in ensuring I gain the skills needed to undertake this project. I would further like to thank members of Kenyatta University Peer Counsellors club whose input has been instrumental in the development of this project.

## ABSTRACT

The mental health wellness application system is a web application that aims to provide users with tools and resources to improve their mental health and wellbeing. The application will offer a range of features, including self-assessment tools, guided meditations, mindfulness exercises, and access to mental health professionals.

The system will utilize a spiral development model, which involves continuous iteration and improvement based on user feedback and testing. The development tools for the system will include programming languages such as Python and JavaScript, Integrated Development Environment like Visual Studio Code, and frameworks like Django and ReactJs.

Data collection procedures for the system will involve conducting surveys, interviews, and a literature review to gather relevant data and insights. All data collected will be anonymized to protect participant privacy.

The system's scope and limitations include a focus on providing tools and resources for improving mental health and wellbeing, with limitations including limited access to mental health professionals and potential limitations in the accuracy of self-assessment tools.

Overall, the mental health wellness application system aims to provide users with accessible and effective tools for managing their mental health and wellbeing, with the potential to make a significant impact on the field of mental health.

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# CHAPTER 1

## 1.1 INTRODUCTION

Kenyatta University Peer counselling team relies on traditional means of reaching out and providing counselling services to students around campus. This however is a setback as most students end up not seeking these services due to fear of stigmatization or due to the counselling offices being unknown. Given the busy schedules students have in the school, and seeing that they spend most of their time on smartphones, it is only easier to bring these services to a screen near them.

## 1.2 BACKGROUND OF THE STUDY

Mental health is a critical aspect of overall health and well-being, yet it often goes overlooked and under-prioritized. Mental health conditions, such as depression, anxiety, and PTSD, are becoming increasingly prevalent in our society, affecting individuals of all ages, genders, and cultures. Despite this, access to quality mental health services remains limited, while some people shun away from seeking help as they do not know where to start.

Studies have shown that individuals with mental health conditions who do not receive proper treatment and support are more likely to experience decreased quality of life, increased stigma, and worse health outcomes. This is due to a lack of understanding of mental health conditions and the limited availability of mental health services in many communities.

## 1.3 PROBLEM STATEMENT

Mental health is a critical aspect of overall health and well-being, yet access to quality mental health services remains limited, mainly due to costs of consultation sessions and lack of confidence to go look for help. Universities too are a hotbed of mental health related issues leading many young people to depression and even suicide. With the increasing prevalence of mental health conditions in our society, it is becoming increasingly important to find innovative solutions to improve access to mental health services. This proposal outlines a plan to develop a mental health wellness application to address this issue.

## 1.4 OBJECTIVES

The objective of this proposal is to develop a mental health wellness application that provides individuals with access to mental health support and resources at their fingertips. The application will be designed to promote mental health and well-being, and provide support for individuals struggling with mental health conditions. It will include the following features:

1. **Self-Assessment Tools:** The application will provide users with self-assessment tools to help them identify symptoms of mental health conditions and track their progress over time.
2. **Mental Health Resources:** The application will provide users with access to mental health resources, such as articles, videos, and podcasts, which promote mental health and well-being.
3. **Therapy Services:** The application will provide users with access to virtual therapy services with licensed mental health professionals, making it easier for individuals to access mental health support from the comfort of their own home.
4. **Peer Support Groups:** The application will provide users with access to peer support groups, allowing them to connect with others who are experiencing similar mental health challenges.

## 1.5 SCOPE AND LIMITATIONS OF STUDY

The scope of this study is to develop a user-centered mental health wellness application that aims to improve the mental health and well-being of individuals. The application will focus on providing resources, tools, and support to individuals who are struggling with mental health challenges, including anxiety, depression, and stress. The application will include features such as mood tracking, meditation, journaling, and guided self-help modules. The study will involve user analysis, prototype development, testing, launch, and ongoing updates, as well as evaluation of the application's impact on user mental health and well-being.

### 1.5.1 LIMITATIONS:

There are some limitations to this study that should be considered. Firstly, the study will only involve a limited number of users during the testing and evaluation phases, which may not be representative of the broader population. Secondly, the study will focus on developing an application for mobile devices and computers, which may not be accessible to individuals who do not have access to such devices. Thirdly, the study will rely on self-reported data from users, which may be subject to bias and inaccuracies. Finally, the study will not provide any clinical diagnosis or treatment for mental health conditions, and the application should not be considered a replacement for professional medical advice or treatment.



### 1.5.2 JUSTIFICATION

Mental health is a critical public health issue affecting millions of individuals worldwide. The World Health Organization (WHO) estimates that one in four people in the world will be affected by mental or neurological disorders at some point in their lives. Mental health disorders can lead to significant distress, impair functioning, and affect overall quality of life.

Technology has the potential to improve mental health outcomes and increase access to care for individuals. Mental health wellness applications have become increasingly popular as a way to provide individuals with tools and resources to improve their mental health and well-being.

By developing and implementing the mental health wellness application, I hope to improve mental health outcomes for individuals and increase access to care and support. The application can provide individuals with a cost-effective, convenient, and accessible way to manage their mental health and well-being. The application could be particularly useful for individuals who may not have access to traditional mental health services, such as those in rural or remote areas or those with financial constraints. Overall, the proposed mental health wellness application has the potential to make a significant impact on the mental health and well-being of individuals.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 INTRODUCTION

In this chapter, research carried out on existing similar systems will be used to study their shortcomings and areas that the new system intends to improve on and fill the gaps.

#### 2.2 REVIEWED LITERATURE

Mental health disorders are a major public health issue, affecting millions of individuals worldwide. The WHO (*September 2021*) estimates that depression alone affects over 264

million people globally, and anxiety disorders affect over 284 million people. The traditional model of mental health care, which relies on in-person appointments with mental health professionals, has limitations in terms of access, availability, and cost.

The use of technology, such as mobile applications, has emerged as a promising tool to address these limitations and improve access to mental health care as stated by National Institute of Mental Health (*April 2021*). Research has shown that mental health wellness applications can be effective in reducing symptoms of anxiety, depression, and stress, as well as improving overall mental health and well-being.

Additionally, these interventions can increase access to care and support, particularly for individuals who may face barriers to traditional mental health services *Corrigan and colleagues (2001)*

However, there are also potential challenges and limitations to the use of mental health wellness applications. These challenges include concerns around data privacy and security, lack of regulation, and potential issues with user engagement and adherence as stipulated in the European Union GDPR laws (*April 2016*).

## 2.3 CASE STUDIES

### 2.3.1: Betterlyf System

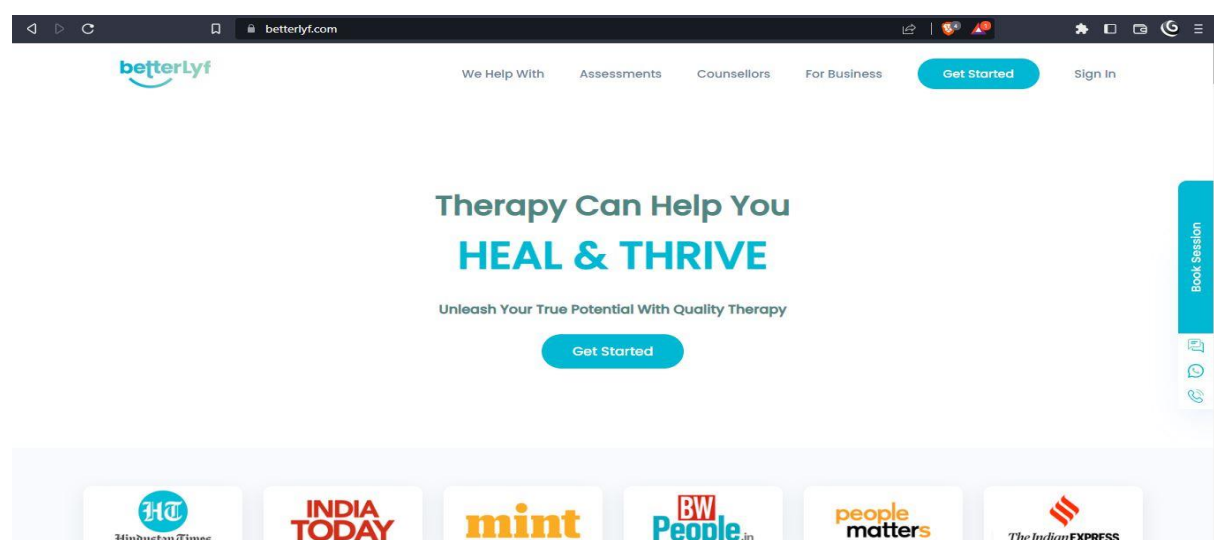
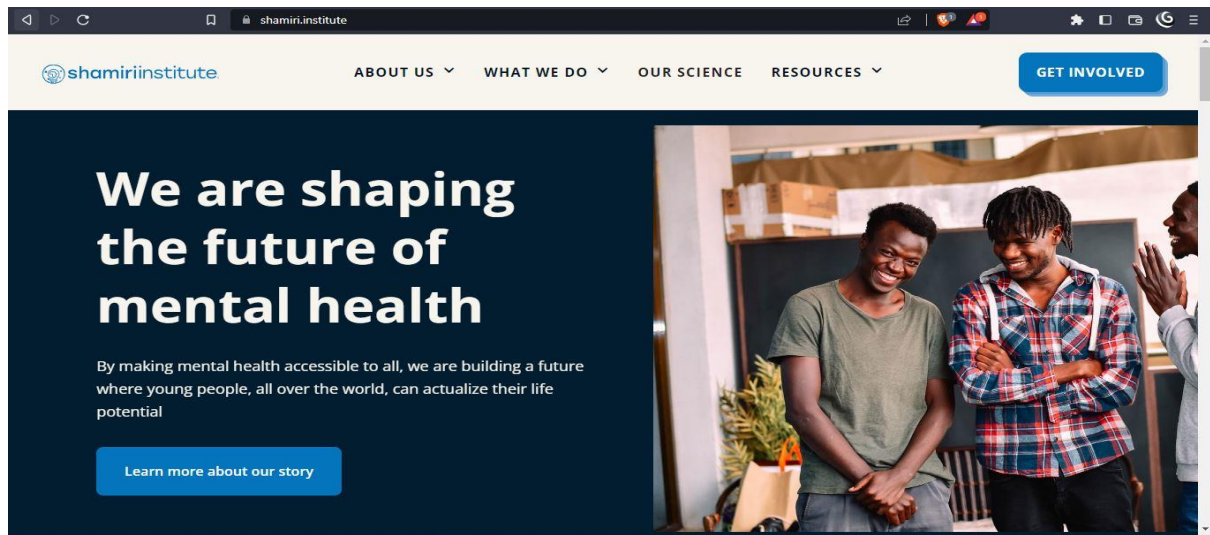


FIGURE 1: BETTERLYF INTERFACE

Betterlyf is an Indian online mental health portal offering secure and private counselling services to a range of people in the Indian society. Despite its successes in India, It is not a viable option for people in Kenya, seeing that it is optimized for a country other than ours and facing problems not similar to ours.

### 2.3.2: Shamiri Health



**FIGURE 2: SHAMIRI HEALTH**

This is the first mental health application built for the Kenyan market complete with a mobile application. The portal provides daily check-ins and support through an automated bot. One disadvantage is that the subscription is a bit expensive for the common university student.

## CHAPTER 3

### METHODOLOGY

#### 3.1 INTRODUCTION

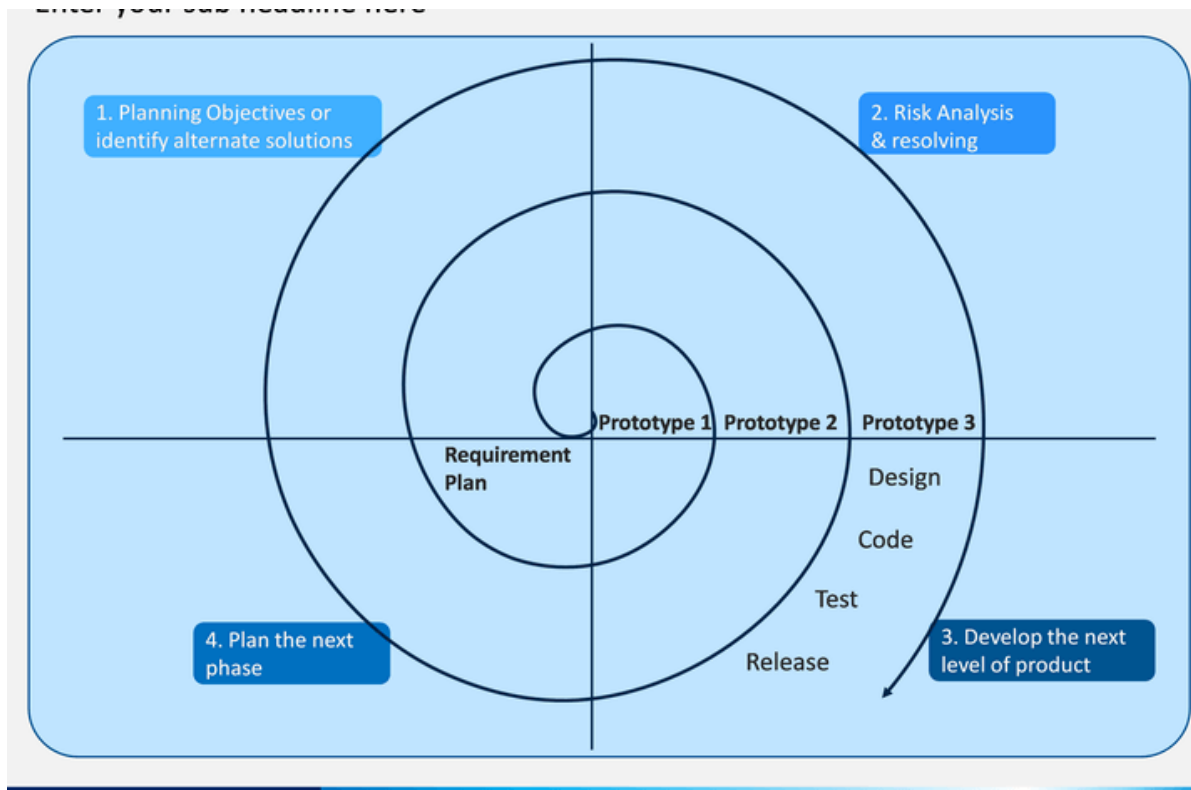
This chapter focuses on the models and ways used to implement the mental health web application solution. The methodology used is Spiral model.

Spiral methodology is a software development model that emphasizes flexibility, adaptability, and iterative development. It is an iterative process that combines elements of both the waterfall model and iterative model. The spiral model is based on the idea of continuously iterating through a series of development phases, each one building upon the previous phase and incorporating feedback from the previous phase.

The spiral model consists of four phases: Planning, Risk Analysis, Engineering, and Evaluation. Each of these phases involves a series of activities that must be completed before moving on to the next phase. The activities within each phase are tailored to the specific needs of the project, and the project team may revisit earlier phases to make changes or adaptations as needed.

The four phases of the spiral model are:

1. **Planning:** This phase involves defining project objectives, requirements, and constraints. The project team establishes a plan for how the project will be developed, including timelines, budget, and resources.
2. **Risk Analysis:** This phase involves identifying and analyzing potential risks and uncertainties that may impact the project. The project team develops strategies for mitigating these risks and creates a plan for managing them throughout the project.
3. **Engineering:** This phase involves developing and testing the product or software. The project team creates a prototype or initial version of the product and tests it to identify and address any issues or bugs. The team then refines and improves the product based on feedback from testing.
4. **Evaluation:** This phase involves evaluating the product and the development process. The project team assesses the product to ensure that it meets the requirements and objectives established in the planning phase. The team also reflects on the development process to identify areas for improvement and to gather insights that can be applied to future projects.



**FIGURE 3: SPIRAL MODEL**

### 3.1.1 DISADVANTAGES

The model requires continuous prototyping which may be a constraint for projects with limited budget and with limited timelines for delivery.

### 3.1.2 USE JUSTIFICATION

1. **Flexibility:** The spiral model allows for a high degree of flexibility and adaptability. As the development process progresses, requirements may change, and new features may need to be added or removed. The spiral model is designed to accommodate these changes, allowing for constant evaluation and revision of the development plan.
2. **Continuous Feedback:** The spiral model is highly collaborative, with constant feedback and communication between the development team and stakeholders. This helps to ensure that the final product meets the requirements of all stakeholders and that any issues are identified and addressed in a timely manner.

### 3.2 Data Collection methods and procedures

The primary data collection procedures included conducting surveys and interviews with participants who met the study's criteria. A survey questionnaire was designed and distributed to a representative sample of the target population, which is the Kenyatta University Peer Counsellors. The survey was distributed through online platforms, and participants were required to fill out the survey form. The questions in the survey were designed to elicit responses that provided insights into how traditional counselling is carried out.

In addition to the surveys, the researcher also conducted interviews with a few students from the university on the issue of mental health and ease in accessing mental health services on campus. The interviews were conducted on sight, each lasting for about 10 minutes. The questions in the interview were quite specific but participants were encouraged to give elaborate answers.

Secondary data collection procedures involved collecting information from existing literature and reports relevant to the study's topic. The literature review was conducted by reviewing scholarly articles, reports, and books on mental health wellness applications. The data obtained from secondary sources were analyzed and synthesized to provide insights into the research questions.

All data collected from the study was anonymized to maintain confidentiality and protect the privacy of participants. The findings from the data collected were used by the researcher to draw conclusions and make recommendations that addressed the research questions.

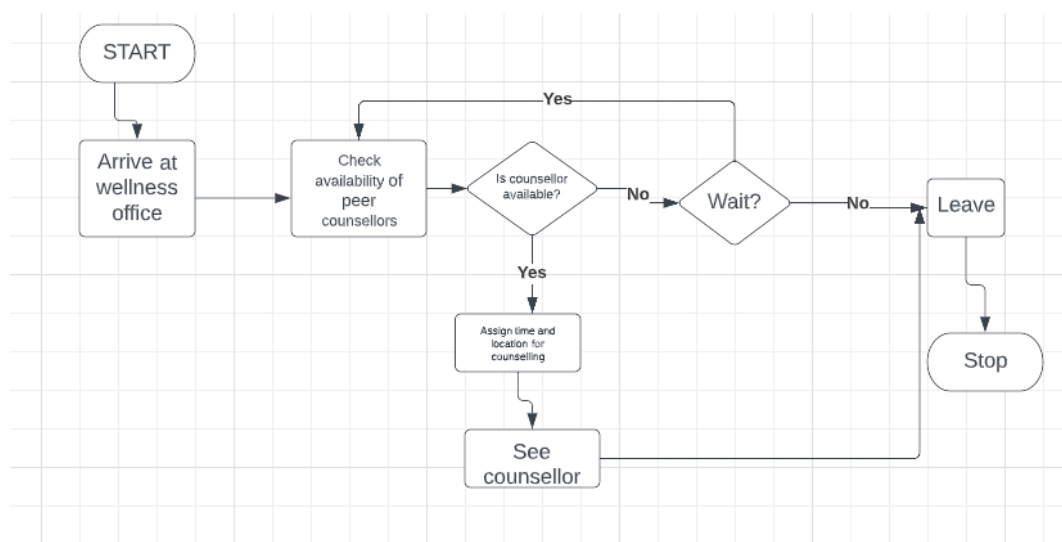
## CHAPTER 4: SYSTEM ANALYSIS

### 4.1 Introduction

System analysis is the process of studying and analyzing a system in order to identify its components, relationships, and behaviors. The purpose of system analysis is to identify problems, inefficiencies, or areas for improvement within a system. By analyzing a system, it is possible to identify bottlenecks, inefficiencies, or other issues that may be hindering its performance. This information can be used to make changes or improvements to the system, or to develop new systems that are more effective or efficient.

### 4.2 Analysis on current system

The current counselling services system is very centralized and the physical aspect of it is quite prominent. The data on the process was collected through interviews with current peer counsellors and research on the University's health and wellness portal. More information was gathered from students around the school. From the interactions with the students, I discovered that majority of them had no idea where the offices themselves are located.



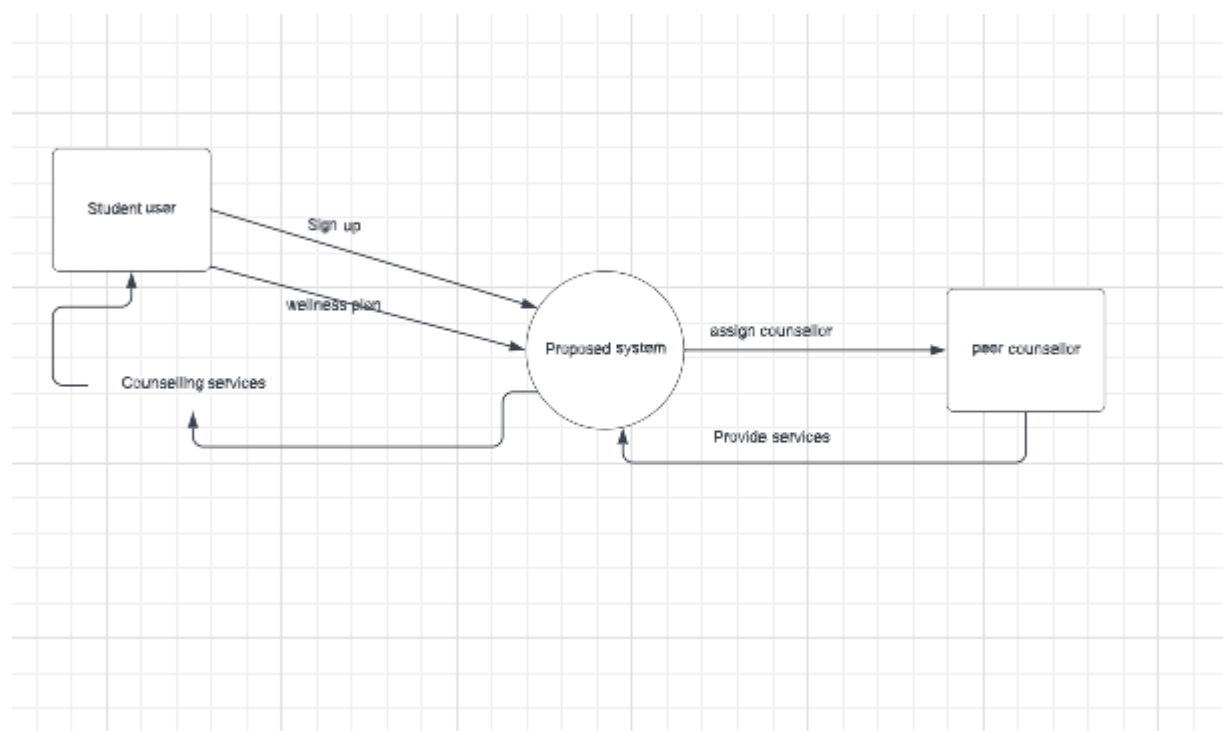
**FIGURE 4: CURRENT SYSTEM FLOW CHART**

The current system falls under the wellness and rehabilitation department, headed by a director, who has a few counsellors working under them to provide the services. Collaborations between the department and peer counsellors club, and the Amazing minds club try to bring the services closer to the student body. The current system's only online presence is a sub-portal on the university website, which has not been updated for some time.

No records are kept from counselling sessions, which might make it challenging to reassess cases in case of a follow-up. Most of the time, the department offers mass workshops which is a disadvantage as most students need personalized services for the issues plaguing them.

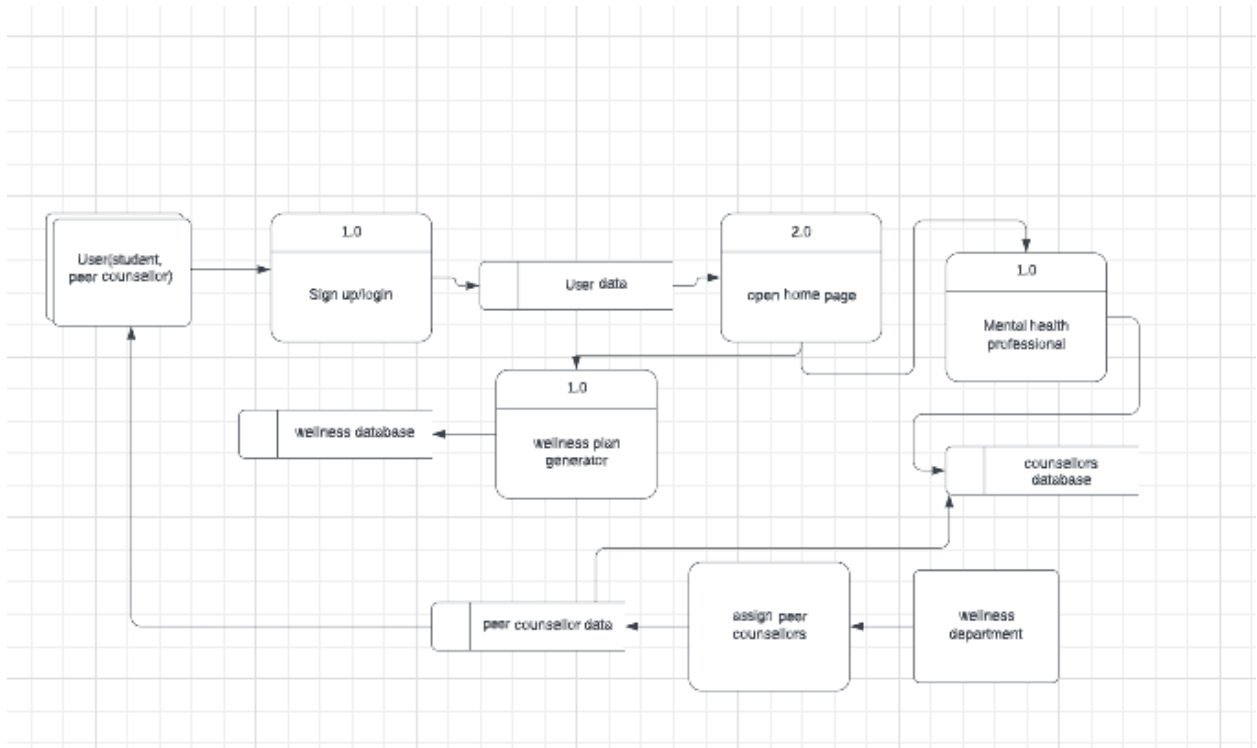
## 4.2 Analysis of the proposed system

The new system was developed in Python Django. The system runs entirely on the web, making it accessible to many students who spend their time online. The platform connects the department of wellness and rehabilitation, the peer counsellors group and the student body, providing confidential and prompt services to students needing guidance and counselling. It could also double up as an information dispensation point to inform students of upcoming workshops on mental health.



**FIGURE 5 CONTEXT DIAGRAM**





**FIGURE 6 DFD DIAGRAM**

## 4.3 Requirement Specification

### 4.3.1 Functional Requirements

User authentication and verification based on whether you are a student, a peer counsellor or from the department of wellness and rehabilitation.

Personal information management to allow users to update their variable information.

Progress tracking capabilities.

User feedback section to allow for improvements.

Show counselling availability

Chat features to receive help on the app

Emergency dialing section connected to the school health unit.

### 4.3.2 Non-Functional Requirements

Performance: be able to handle a large number of users simultaneously

Reliability: Be up and running all the time to prevent user frustrations

Compliance: Adhere to data laws and university regulations.

Secure: Ensure all user data is well protected, as health data is sensitive.

## CHAPTER 5 SYSTEM DESIGN

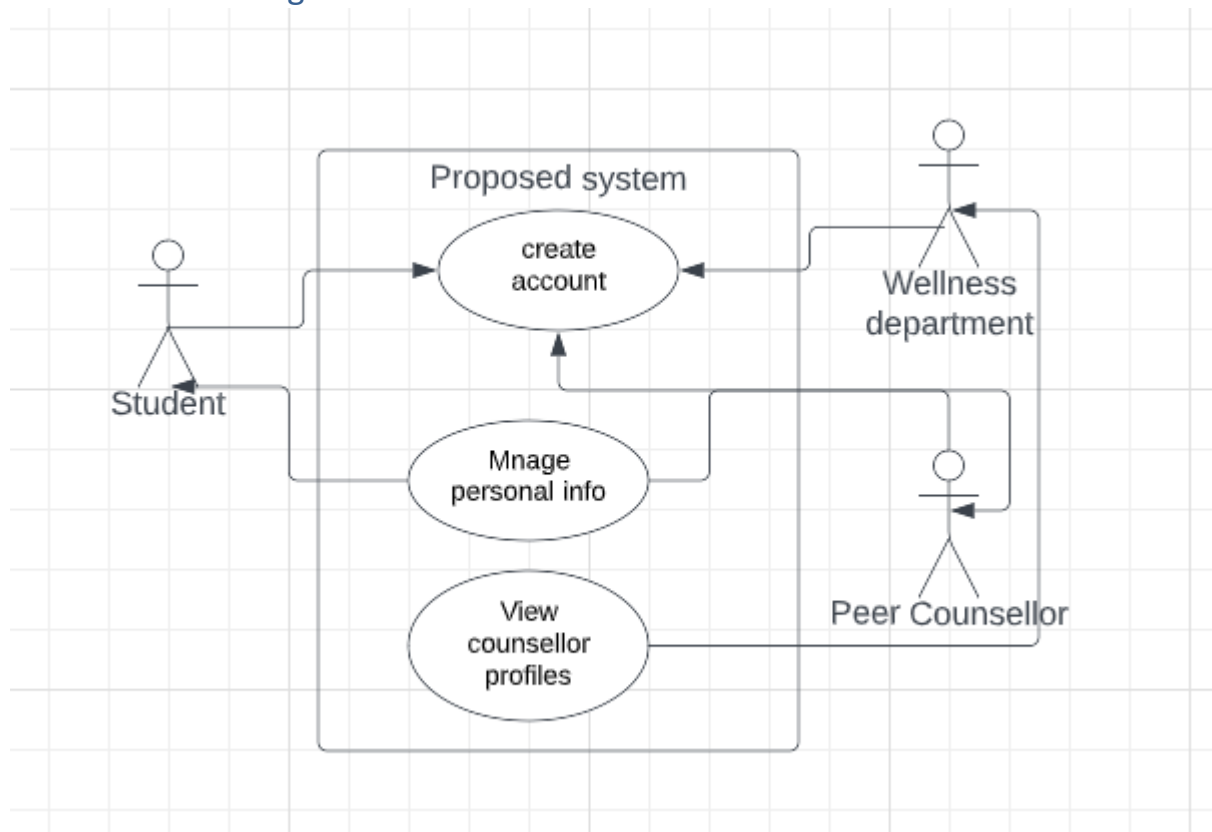
### 5.1 Introduction

This chapter introduces the proposed system design from the inner workings to the user interface. This is done using various SDLC diagrams and wireframe mockups of the proposed solution.

### 5.2 Process Design

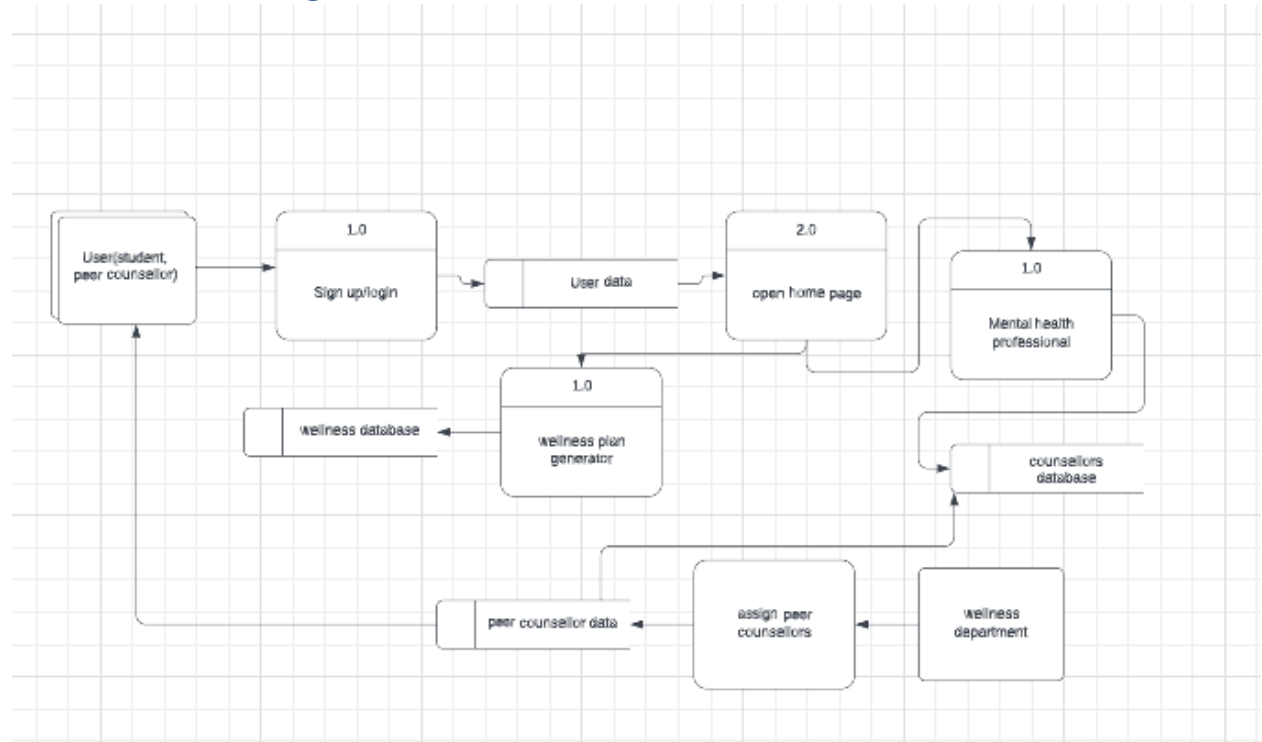
This is a design of activities and procedures a user of the platform follows.

#### 5.2.1 Use Case Diagram

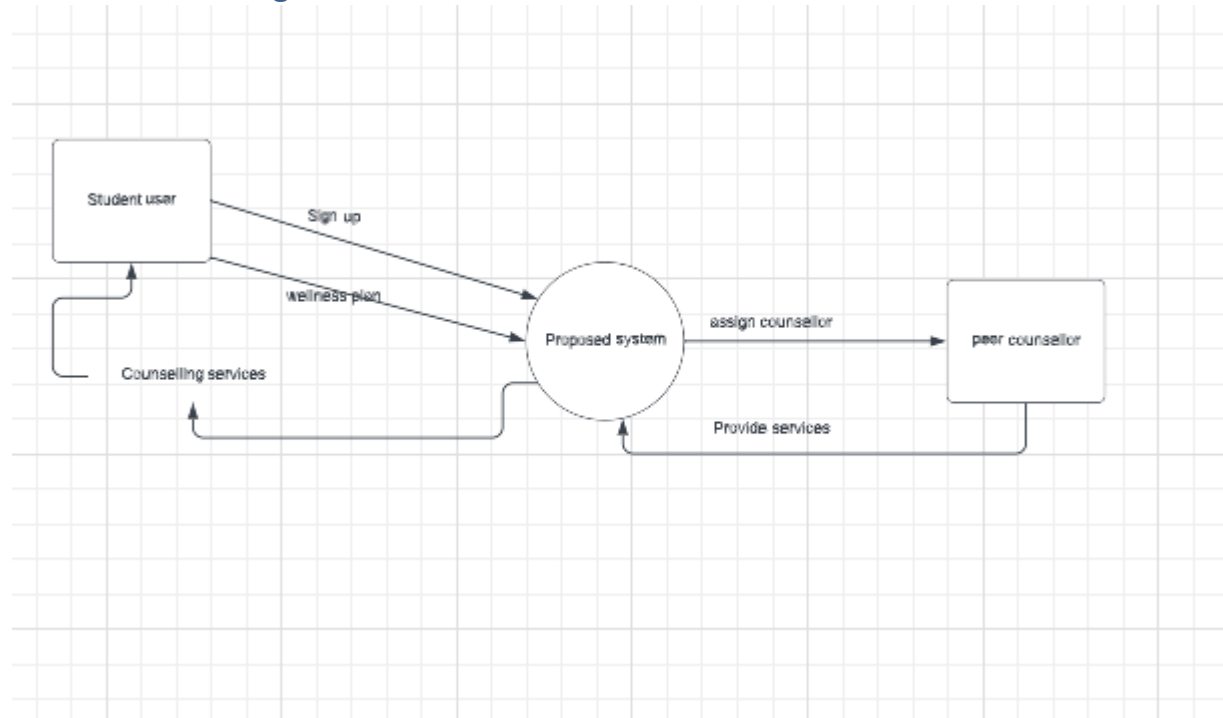


The use case diagram shows how the actors interact and use the system as assigned to them. The processes vary depending on the designation of the user in question.

## 5.2.2 Data Flow Diagram



## 5.2.3 Context Diagram

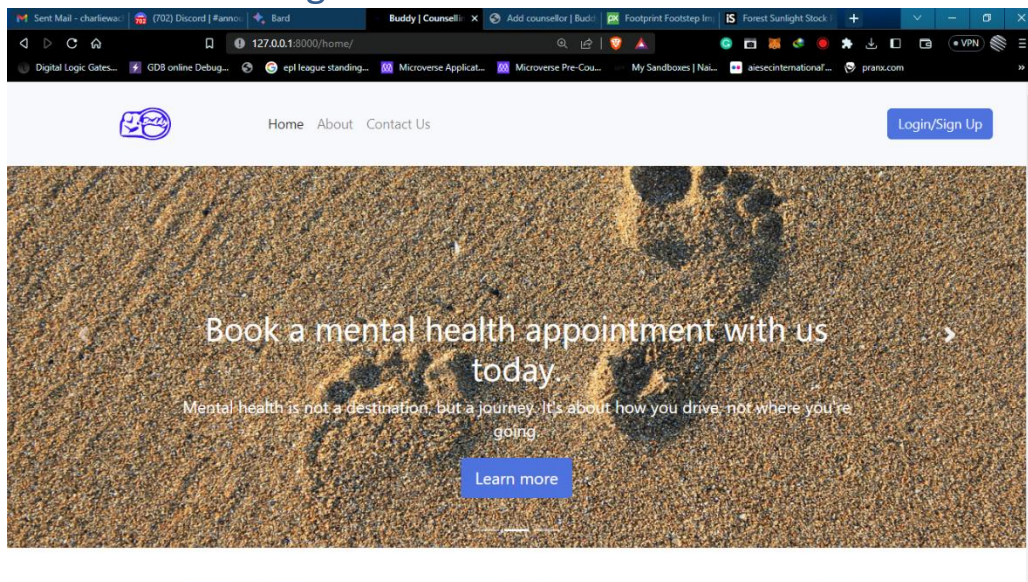


### 5.3 System architecture

Event-Driven Architecture: This architecture involves the use of events to trigger actions and communicate between different components of the system. Events can be generated by user actions, system events, or external systems. This architecture is particularly useful for systems that need to handle a large volume of events and require real-time processing.

The choice of architecture was informed by the need for the system to simultaneously handle a large user base and allow for the individual users to trigger their own actions on the system depending on what they need to do.

### 5.4 Interface design



The system was designed for use both on the web app and as a mobile app. Shown above is a sample of its representation on web.

## CHAPTER SIX

### System Implementation

#### 6.1 Tools Used

1. **Programming Languages:** The system was developed using JavaScript and Python as the primary languages. HTML was incorporated as the system runs on the web and CSS is used to style the page structures for amazing UI.
2. **Integrated Development Environments (IDEs):** The IDE of choice used for development and debugging was Visual Studio Code given its high language compatibility and capacity to develop high level systems.
3. **Database:** For data storage, the system uses SQLite which comes preinstalled with Django.
4. **Frameworks:** Frameworks used for ease of development include Django python framework for backend, React JavaScript framework for frontend and Tailwind CSS framework for styling.
5. **Version control:** To keep the system up to date and monitor progress on development, Git was used and GitHub acted as the code repository application of choice.

### Proposed Changeover techniques

1. **User Authentication and Authorization:**
  - Implement robust user authentication and authorization mechanisms to protect sensitive user data.
  - Consider using OAuth2 or JWT (JSON Web Tokens) for secure authentication and session management.
2. **Two-Factor Authentication (2FA):**
  - Add support for two-factor authentication to add an extra layer of security for user accounts.
3. **Data Anonymization and Encryption:**
  - Anonymize sensitive user data wherever possible to ensure the data is not directly linked to individuals.

## CHAPTER 7

### LIMITATIONS, RECOMMENDATIONS AND CONCLUSIONS

#### 7.1 Limitations

**Not Suitable for Severe Conditions:** People with severe mental health conditions, such as schizophrenia or severe depression, may require more intensive and specialized care than what an app can provide.

**User Reliability and Compliance:** The effectiveness of mental health apps depends on user reliability and adherence to using the app consistently. Many users may not use the app regularly or follow through with recommended exercises or activities.

**Data Privacy and Security Concerns:** Mental health apps may collect sensitive user data related to mental health conditions, which can raise privacy and security concerns if not handled properly.

**Inequality in Access:** Not everyone may have access to smartphones or the internet, limiting the reach of mental health apps, especially in underserved or rural areas.

#### 7.2 Recommendations

**User-Driven Design:** Involve users (both mental health professionals and individuals seeking support) in the design process. Gather feedback through surveys, focus groups, or interviews to understand their needs, preferences, and pain points.

**Personalization:** Implement features that allow users to personalize their experience based on their specific mental health goals and preferences.

**Evidence-Based Interventions:** Work with mental health professionals to integrate evidence-based interventions and therapeutic techniques into the application.

**Real-Time Support:** Consider adding a live chat feature or virtual support groups to offer real-time assistance to users who may need immediate help.

#### 7.3 Conclusions

The mental health Django application holds the potential to be a valuable tool in promoting mental well-being, empowering users with educational resources, personalized interventions, and real-time support. While it cannot replace professional mental health care, it can complement traditional approaches and reach a broader audience. By prioritizing user privacy, security, and ethical considerations, the application can make a positive impact on users' lives and contribute to a healthier and more supportive mental health landscape.

# APPENDICES

## a) Interesting codes

```

models.py - SCO-400 - Visual Studio Code

buddy > website > models.py

75 counsellor = models.ForeignKey(Counsellor, on_delete=models.CASCADE, related_name="CounsellorServiceField") # counsellor fk
76 app_total = models.IntegerField(default=0) # total students/appointments completed by counsellor
77
78 def __str__(self):
79     return f'{self.counsellor.first_name} Service Field Information'
80
81 # Appointment
82 class Appointment(models.Model): # student appointment details
83     student = models.ForeignKey(Student, on_delete=models.CASCADE, related_name="StudentApp") # student fk
84     counsellor = models.ForeignKey(Counsellor, on_delete=models.CASCADE, related_name="CounsellorApp") # counsellor fk
85     description = models.TextField(max_length=500) # appointment description
86     app_link = models.TextField(null=True, blank=True) # video call room link
87     app_date = models.DateField(null=True, blank=True) # call date
88     app_time = models.TimeField(null=True, blank=True) # call time/slot
89     status = models.BooleanField(default=False) # appointment status (approved/on-hold)
90     completed = models.BooleanField(default=False) # appointment completed/to-be-done
91     approval_date = models.DateField(null=True, blank=True) # date appointment approved
92     rating = models.IntegerField(default=0)
93
94 def __str__(self):
95     return f'{self.student.first_name} {self.counsellor.first_name} Appointment'

```

TERMINAL

```

[14/Jul/2023 09:27:01] "GET /profile_pictures/IMG_1289_2nB4PGT.webp HTTP/1.1" 404 12811
[14/Jul/2023 09:27:04] "GET /download-report/ HTTP/1.1" 200 2490
[14/Jul/2023 09:28:24] "GET /view/appointments/ HTTP/1.1" 200 28035
Not Found: /profile_pictures/IMG_1289_2nB4PGT.webp
[14/Jul/2023 09:28:25] "GET /profile_pictures/IMG_1289_2nB4PGT.webp HTTP/1.1" 404 12811
[14/Jul/2023 09:28:34] "GET /dashboard/admin/ HTTP/1.1" 200 37582
Not Found: /profile_pictures/IMG_1289_2nB4PGT.webp
[14/Jul/2023 09:28:35] "GET /profile_pictures/IMG_1289_2nB4PGT.webp HTTP/1.1" 404 12811
(virtual) PS C:\Users\User\Desktop\SCO-400\buddy>
History restored

```

FIGURE 7: MODEL VIEWS

```

views.py - SCO-400 - Visual Studio Code

buddy > website > views.py > all_app_admin_view

45 # Admin
46 def register_admin_view(request): # register admin
47     if request.method == "POST":
48         registration_form = AdminRegistrationForm(request.POST, request.FILES)
49         if registration_form.is_valid(): # get data from form (if it is valid)
50             dob = registration_form.cleaned_data.get('dob') # get date of birth from form
51             today = date.today()
52             age = today.year - dob.year - ((today.month, today.day) < (dob.month, dob.day)) # calculate age from dob
53             if dob < timezone.now().date(): # check if date of birth is valid (happened the previous day or even back)
54                 new_user = User.objects.create_user(username=registration_form.cleaned_data.get('username'),
55                                                         email=registration_form.cleaned_data.get('email'),
56                                                         password=registration_form.cleaned_data.get('password1')) # create user
57             adm = Admin(admin=new_user,
58                         first_name=registration_form.cleaned_data.get('first_name'),
59                         last_name=registration_form.cleaned_data.get('last_name'),
60                         age=registration_form.cleaned_data.get('age'),
61                         dob=registration_form.cleaned_data.get('dob'),
62                         address=registration_form.cleaned_data.get('address'),
63                         city=registration_form.cleaned_data.get('city'),
64                         country=registration_form.cleaned_data.get('country'),
65                         postcode=registration_form.cleaned_data.get('postcode'),
66                         image=request.FILES['image']) # create admin
67             adm.save()
68             group = Group.objects.get_or_create(name='Admin') # add user to admin group
69             group[0].user_set.add(new_user)
70
71
TERMINAL
[14/Jul/2023 09:28:35] "GET /profile_pictures/IMG_1289_2nB4PGT.webp HTTP/1.1" 404 12811
(virtual) PS C:\Users\User\Desktop\SCO-400\buddy>
History restored

```

FIGURE 8: STRUCTURE VIEWS.PY FILE

image	first_name	last_name	dob	course_name	student_address
1 profile_pictures/abra...	Charles	Ruita	2002-09-19	BSc. Computer Science	+254788118852
2 profile_pictures/ama...	Sam	Wachira	2004-07-04	BSc. Civil Engineering	+254112564846
3 profile_pictures/amo...	Charlie R	Wachira	2001-04-05	Bsc Mechanical Engineering	+254712345678

**FIGURE 9: SAMPLE DATA IN DATABASE**

## **b) Technical guide and users' manual**

### **i) System Requirements**

The system is online hosted as a web app and makes it easier for anyone with a smartphone to access the system and use it. For offline use and testing and development, a computer with python installed and Django packages installed is required. The latest version of Visual Studio Code is also required to test and run the system.

### **ii) Installation instructions**

Download Python and install it on the system to Path.

Download visual studio code and install it.

Open the program folder in visual studio code and open the command line terminal and navigate to the product folder.

Create a virtual environment in the folder and activate it.

Run the command pip install requirements.txt to install dependencies required.

Run Django make migrations to initiate the database and migrate.

Run the command python manage.py run server to start the server in development.



Proceed to local host to view the webapp.

iii) **Database**

SQLite, the database in use comes preinstalled and all the user has to do is make migrations in the app to initiate it.

**TABLE 1: GANTT CHART FOR ACTIVITY PLAN**

ACTIVITY	TIME(Months)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Creating Concept Paper																
Literature review																
Project planning and requirement specification																
System Analysis																
Proposal writing																
Software design																
System Coding																
System testing																
System implementation																
Documentation																

## Project Proposed Budget

Expense	Cost(Kshs)
Development Laptop	55000
Internet connection	4500
Web hosting	2000
Domain name	700
Miscellaneous	1500
<b>Total</b>	<b>63700</b>

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