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**UWEZO-APP: A COUNSELLING SESSION APPLICATION**

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An Informatics and Computer Science Final System Documentation submitted to the School of Computing and Engineering Sciences in partial fulfillment of the requirements of the award of Degree in Bachelor of Science in Informatics and Computer Science

Declaration

We declare that this final system document has not been submitted to Strathmore University or any other University for the award of a degree in Bachelor of Science in Informatics and Computer Science or any other degree.

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Abstract

Anxiety, suicidal thoughts, and a variety of other activities are all common causes of mental disorders. People suffering from any of these disorders require assistance because they can halt a person's productivity.

Many efforts have been made to treat mental health since it was identified to be a serious medical issue. The first outpatient mental health clinic was established in the United States in the early 20th century. Much has been done since then to guarantee that many more individuals have access to mental health treatments.

To ensure that the service is easily accessible, several online platforms have been created to supplement the manual method of walking to the counsellor. People go through different things, and not everyone wants to have that one-on-one conversation with a counsellor, perhaps due to privacy concerns or a lack of time for the physical conversation with the counsellor, but they also want their needs to be met. As a result, there is a need for a system that allows clients to interact with counsellors online, with additional features such as the ability to talk anonymously for those who are concerned about their identity. A mobile application will be used to implement the proposed solution.

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# Introduction

## Background information

Therapy, also known as psychotherapy or counselling, is the process of meeting up with qualified therapists to resolve problematic behaviours, beliefs, feelings and/or somatic responses. Teletherapy is an online delivery of mental health therapy services, or various other forms of therapy, via live video conferencing software (Benefits of Teletherapy, 2020). It was introduced in the 1990s in the United States although it has really grown in the past few years (Mead, 2021). The Covid-19 situation has intensified the practice of therapy over the internet via software like zoom and skype. Teletherapy sessions are similar to traditional mental health appointments with one main difference. Rather than sitting face-to-face, clients and therapists interact via online conferencing. During teletherapy sessions, clients and therapists can see, hear, and interact with one another in real time using a computer, tablet, or smartphone.

Therapy overshadows many types. For different conditions, different approaches for treatment are applied. There are many types of therapy depending on one’s condition. According to Mead (2021), they are as follows:

* Psychodynamic therapy takes the approach of talking about the patient's thought to uncover patterns or behaviours that lead to distress
* Behavioural therapy takes the approach of focusing on ways to change the behavioural reactions and patterns that cause distress.
* Cognitive behavioural therapy tries to identify patterns and learn how they may affect the patient negatively.
* Humanistic therapy is an approach that looks at how your worldview affects the choices you make, especially choices that cause distress.

Mental health therapy is delivered one-on-one with the psychologist or collectively with other patients involved (M. Dilgul, 2021). Collective is another way of conducting therapy which involves more than just the patient and their mental health practitioner.

## Problem Statement

Lack of a concrete solution that addresses chat based mental health delivery to the patients in Kenya. Furthermore, stigma, stereotypes, racism, etc. greatly limit access to care and decreases quality of life for individuals affected by Mental, neurological, and substance disorders (David Ndetei, 2021).  Anonymity being a key factor in mental health provision but not being addressed in the current systems and lack of a centralized repository of psychologists.

## Objectives

### General Objective

To develop a chat based mobile application that solves the stigma problem through anonymity and allows patients with mental health disorder to find and get help from a professional mental health practitioner.

### Specific Objectives

1. To analyse the challenges faced by people with mental health disorder
2. To study and analyse how current solutions have tried to solve the delivery of teletherapy
3. To design a chat based mobile application that enables the delivery of teletherapy
4. To develop the mobile application by implementing the design
5. To test the proposed solution to find and correct bugs

## Research Questions

1. How have mental health therapies been delivered?
2. How have current solutions tried to solve mental health stigma?
3. What are the challenges in finding a psychologist to talk to when one is depressed?
4. What are the limitations in reaching a big audience?
5. How is the proposed solution solving the current problem?

## Justification

The proposed solution will allow mental health care to be delivered through the application where people suffering from mental health disorder can find a mental health practitioner to provide the necessary care. It will contribute to the possibility for mental health practitioners to meet a large audience which was not possible with the traditional approach of mental health delivery.

## Scope and Limitations

The scope for this research is limited to the delivery of online mental health in Kenya. The system will only provide a platform where the patients can search and talk to a mental health practitioner.

# Literature Review

## Introduction

This chapter examines the existing technological solutions that support the delivery of counselling, how they work, and the challenges that people face when using these current systems. Finally, the gaps in the existing counseling management solutions will be addressed.

## Current Techniques

According to Charles (2007), face-to-face counselling occurs when a counsellor meets with a client in a private and confidential setting to discuss a problem the client is experiencing, distress they may be feeling, or their dissatisfaction with life, or loss of a sense of direction and purpose. By attentively and patiently listening, the counsellor can begin to perceive the difficulties from the client's point of view and assist them in seeing things more clearly, possibly from a different perspective. The client can explore various aspects of their life and feelings in the counselling sessions, talking about them freely and openly in a way that is rarely possible with friends or family. The counsellor will encourage the expression of emotions and, because of their training, will be able to accept and reflect the client's problems without becoming burdened by them. The counsellor may assist the client in considering their options and deciding which is best for them. Counsellors are trained to observe your nonverbal communication (for example, your facial expressions and posture) to gain a better understanding of what you are saying. Patients can improve their communication skills because of this. It is a more intimate form of therapy. (Charles.J, 2007)

Teletherapy is the delivery of mental health therapy services or other types of therapy over the internet using live video conferencing software (Benefits of Teletherapy, 2020). According to Mead (2021), teletherapy was first introduced in the United States in the 1990s, but its popularity has skyrocketed in recent years. The Covid-19 situation has increased the use of internet-based therapy software such as Zoom and Skype. Teletherapy sessions are similar to traditional mental health appointments with one exception. Clients and therapists communicate via online conferencing rather than face-to-face. Clients and therapists can see, hear, and interact with one another in real time during teletherapy sessions by using a computer, tablet, or smart phone.

### Challenges of Current Techniques

Unfortunately, guilt, shame, and stigma surrounding mental health disorders often prevents many from seeking treatment***.*** With counsellors knowing the identity of their patients, patients may tend to keep information to themselves, or may be discouraged from visiting a counsellor to seek treatment (Benefits of Teletherapy, 2020). Apart from retention of information by the patient, the question of appearance, age, sex, race, disability etc. arises. For example, nowadays, there is a tension regarding racism, so there might be a patient who has mental problems but because the therapist is a person of colour, they would not seek help which might result in damage, and sometimes even death.

## Related Works

Four applications in the field will be discussed in this section. These are Wazi, Niskize, BetterHelp system and ReGain System.

### Wazi

Wazi technology platform provides digital tools for counselors, counseling groups, NGOs, and the government. The platform also helps manage, customize, and track mental health assessments (ex. PHQ9, GAD7) to manage beneficiary wellbeing and progress over time (Wazi Technology Platform, 2021). A client can access wazi through Facebook Messenger or Telegram. A user can also access the platform through their web application. In both instances, one is required to sign up using a valid email address. The user is allowed to input an anonymous username that is used whenever they need to connect to therapists. Users are also given the opportunity to rate their counsellors after the sessions.

If a user chooses to connect to wazi through Facebook Messenger or Telegram, they first communicate with a chatbot and then have a chat with a real counsellor. While using the web application, the user can book a session with a therapist and has a session with the therapist via private video calls.

Graphical user interface, application

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Figure 2.1 Choosing a counsellor from the Wazi Web Application

### Niskize

Niskize is a leading psychological counseling and corporate training firm in Kenya. They provide restorative psychology, positive psychology, diagnostic assessment, and psychometric testing. Niskize runs both corporate and individual programs to ensure that professional counseling services, such as but not limited to Loss and Grief, Marriage and Relationships, Trauma, Anxiety, Depression, Workplace challenges, and Addictions of all kinds, are available both at work and at home.

Besides running a 24hr call center to offer emergency telephone counseling at the touch of a dial, Niskize offers face to face sessions as well as online talks and group sessions to special groups such as Teenagers/Adolescents, people living with long term health challenges, persons struggling with trauma as well as substance abuse (Niskize, 2021).

Their view of a 21st-century support group is to have a mobile community on your phone with people from all over the world going through exactly what you are, sharing experiences, victories, and failures, and having the support of each other as well as a professional psychologist. To sign up for these support groups, users must enter their full name, phone number, a valid email address, and select their preferred support group. A user is not restricted to a single support group. This is seen in Figure 2.2 below:

Graphical user interface, application, Teams

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Figure . Form filled to join group sessions on the Niskize Web Application

### BetterHelp System

BetterHelp is the world's largest e-counselling platform. Their mission is to make professional counselling accessible, affordable, and convenient so anyone who struggles with life’s challenges can get help anytime, anywhere. The potential users of the system are clients from all over the world with a variety of presenting issues, such as anxiety and depression, career shift, adjustments in life, and anger management. The major characteristic of users working with the system is that they are those people who are trying to figure out how to cope with family, and friends who have opposing views and many more (Matas, 2019).

In the BetterHelp platform users can enlist themselves to the platform through the Get Started button and login to their account if they had already registered. Users can also browse through the various navigation buttons getting various services like advice on the topics of choice. There is also a survey that is in place to enable users to go straight to explaining the type of challenge that they might be facing without necessarily enrolling into the platform. Figure 2.1 shows the starting page for users registering for the first time

Graphical user interface, application, Teams

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Figure . BetterHelp Registration Page

In Figure 2.3, there is a survey that is provided to the users using the platform for the first time to be able to describe the type of challenge in which they could be facing. Also, they can learn more on what online therapy is and how it could be beneficial in helping them with their challenges.

### ReGain System

ReGain is an online e-counselling platform that seeks to help couples in their various challenges seeking to regain their joy, affection, intimacy, companionship, and trust in the relationship. The potential users of the system are couples who are facing various relationship constraints and are seeking to renew and regain their joy, affection, intimacy, companionship, and trust back in the relationship. The major characteristic of people using the platform is that the users are those who are having problems in their relationship life and is taking a toll on them, but they are willing to make it work again and renew what they once had (ReGain, 2019).

In the ReGain platform users can enlist themselves to the platform through the Get Started button and login to their account if they had already registered. Users can also browse through the various navigation buttons getting various services like advice on the topics of choice. The users can also get reviews about the platform by going through the written reviews about the platform for them to get a good basis on the platform.

Figure 2.2 shows the starting page for users registering for the first time

Graphical user interface, text, application, email

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Figure 2.2 ReGain System Registration (Regain, 2019)

In Figure 2.2 there is a survey that is provided to the users to describe and provide certain information and how they would like their counselling sessions to be. They also specify the type of challenge in which they could be facing.

## Gaps in related Works

Where the Wazi platform falls short is, it requires users to input valid email addresses to sign up and thus use the platform (Wazi Technology Platform, 2021). This may discourage users as they are required to input information that may be connected back to them which therefor does not make the users anonymous. Apart from that, the layout of their website makes it difficult to know how to contact the counsellors as that information is not immediately presented to the users upon visiting the site.

Niskize is a platform most suitable for patients who prefer to share their experiences with other patients and receive counseling in form of support groups. The issue presented by this system is it requires users to provide their details. According to Niskize (2021), this includes their full names, phone numbers and email addresses to sign in. This discourages patients who would prefer to have confidential one-on-one sessions and those who would prefer their identity be hidden.

BetterHelp platform is a very reliable and convenient e-counselling platform, but it has an existing flaw in that you cannot enlist to work as a counsellor in the platform if you’re not a United States citizen (Matas, 2019). Foreign users using the platform may not be able to connect well with the counsellors because they lack the native connection hence may not be able to relate to the challenge in which the user is going through. It also requires a client’s personal information to log into the system which compromises user identity.

ReGain platform is a very reliable and convenient e-counselling platform but it has an existing gap in that the only way you connect to the counsellors on the platform is through online texting through the platform. Also, the user is not able to communicate with the counsellor unless he/she is online on the platform hence might cause an inconvenience to the user (Regain, 2019). Furthermore, it is only limited to couples seeking help and advice in their relationship.

The proposed solution will not require the users to input any personal information such as their email addresses or phone numbers thus keeping them unknown to others. It will also implement chatting as a means of communication in place of video chatting as another means to keep their identity unknown.

## Conceptual Framework

The system will have two types of users, the patient, and the psychologist. The psychologists will require to be logged in to use the system. However, this will not be required of the patient so as to keep them anonymous. The patient will be able to communicate with psychologists within a given time frame via text chatting. Once the session is over, the records of the chat will be deleted. Figure 2.4 below shows the conceptual framework.

Diagram

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Figure . Conceptual Framework

# Research Methodology

## Introduction

This chapter will discuss the methodology to be applied in building the proposed solution. It will also address the requirements of the system.

## Research approach, techniques and designs to be applied

The proposed system will be developed using software prototyping methodology. Prototyping can improve the quality of requirements and specifications provided to developers. Because changes cost exponentially more to implement as they are detected later in development, the early determination of what the user really wants can result in faster and less expensive software.

Diagram

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Figure . Prototyping Methodology

### **Requirement gathering**

At this phase of the development, the problem had been defined and requirements understood.

### Analysis

At this level of development, the diagrams will be developed to give a better view and understanding of the requirements.  Using the diagrams and results from the requirement gathering stage, the system was designed and implemented.

### Prototyping

The prototype of the system will be produced for the end-user to use and give feedback to be implemented in a later version of the system.

### Testing

The system will be tested to see if it responded to the requirements. Black box testing will be carried out.

## System Analysis

### Use Case Diagram

Usability, (2021) argues that a use case is a written description of how users will perform tasks on the system.  It outlines, from a user’s point of view, a system’s behaviour as it responds to a request.

The use case diagram will help understand the high-level interaction between the user and internal services.

### Sequence Diagram

The sequence diagram illustrates how the different objects of a system interact with each other to carry out a function, and the order in which the interactions occur when a particular use case is executed. (Athuraliya, 2021)

The diagram will allow the understanding of object interactions as function-based actions in the system.

### System Sequence Diagram (SSD)

 A System Sequence Diagram shows, for a particular course of events within a use case, the external actors that interact directly with the system, the system (as a black box), and the system events that the actors generate (FH Vorarlberg University of Applied Sciences, 2021). Time proceeds downward, and the ordering of events should follow their order in the scenario.

SSDs simply assume a higher level of abstraction and thereforethe diagram will help visualise the flow of control between the system and the actors.

### Entity Relationship Diagram

An entity relationship diagram (ERD) shows the relationships of entity sets stored in a database. An entity in this context is an object, a component of data. An entity set is a collection of similar entities. These entities can have attributes that define its properties (SmartDraw, 2016).

This diagram will help to understand the relationships between entities in the database by providing a high-level view entity relationship and attributes.

## System Design

### Database Schema

A database schema is an abstract design that represents the storage of your data in a database. It describes both the organization of data and the relationships between tables in a given database (Kopecky, 2020).

### Wireframes

Wireframes are visual representations of the interfaces the user interacts with while using the application. They describe the flow of the information to be displayed to the users of the system.

Wireframes helped us to iterate on the presentation layer to have an information flow that is intuitive to the user.

### System Architecture

An architecture is the fundamental organization of a system, embodied in its components, their relationships to each other and the environment, and the principles governing its design and evolution (MITRE corporation, 2010).

The system architecture diagram helps us to understand the interaction between components in the system.

## System Deliverables

### System proposal

Is a documentation form that provides information about the proposed system. It allows an iteration over the idea and the requirements before the system is built. It allows the analysis and validation of the of the problem at hand.

### Authentication Module

An authentication module is a plugin that collects user information consisting of registration and login. It checks the existence of a particular user in the system

**3.5.2** Chat server module

Achat server module is an implementation that acts as a middle layer between the client using a chat system.

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Appendices

Timeline

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Appendix : Gantt Chart