

# Hlanganani

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## ABSTRACT

People in the rural areas attend meeting with community leaders regularly in order to get updates about new developments and in light of covid-19. The project gives interest to developing a digital community mass update platform that will focus on making meeting information accessible digitally to the people using a language that is easier for key persons Zenzeleni community network is providing services to. The communication platform will be controlled and updated by the admins to provide information to the key persons about discussed issues with the chief, covid-19 information, social grant and more. The purpose of the platform is to help amplify ways in getting efficient and reliable information from community leaders to community members about opportunities and meeting through devices. Using related research papers will help analyse the community. The project will be implemented as a hybrid application. The project will include the following sections, related work of the proposed solution, user requirements and requirements analysis, high and low level design, a prototype and an implementation section. The following sections will be included in the project: introduction, related work, user requirements and requirements analysis, User interface high level DESIGN, low level design, and an implementation section, testing and the conclusion.

## KEYWORDS

Mobile communication, information sharing

## 1 INTRODUCTION

The Internet has changed the way we do and view things. Assuming since the project is for rural areas, there are community leaders and the king[1]. In such rural areas meetings are called to discuss the developments of the area. The traditional structure of community meetings consists of speakers which are community leaders and members of the community who are there to get information from the speakers. The speakers will address issues faced by the community and how the leaders plan to solve the issues and accept suggestions from the community members. I would like to build a platform that will notify and keep people updated about the community events, meetings and opportunities that are available and feed the community with information on an online platform by posting information that is relevant to community members and always be easily accessible on a controlled environment.

Rural communities are unique from the urban areas in South Africa, people in the rural area are still govern by the chiefs,

they still practice their culture and activities that require IT are not practiced by many. People In the rural areas still attend face to face meetings regularly with their community leaders to get update about the upcoming developments and get report of the previous updates[2]. With covid-19 in place people are forced to stay home and keep social distancing. The project will try to amplify the way meetings in the rural areas are held by digitalizing meetings so that everyone can have access to the information from the meeting while keeping social distancing[3]. The project will define an easy way to get a message across to a rural area [1].

Zenzeleni Network is an affordable wireless internet service provider based in rural South Africa that is operated by the community. It is a wireless internet service provider that is owned and managed by the community for the community. It provides high-quality internet, high-speed internet, comparable to the most advanced urban centers in the world. The goal of the model used is to reduce overall telecommunications costs, maintain community investment as a means of social entrepreneurship, and encourage the creation of a rural digital ecosystem to bridge the digital divide. The paper will focus on building the online community for the Xhosa speaking people of the Eastern Cape. The project will help in developing the rural area and make it easy to share important information in real time on everyone who has access to Zenzeleni Network.

The people of Mankosi community with UWC researcher worked on developing a solar powered wireless community network named Zenzeleni Networks. Zenzeleni provides affordable connectivity to rural inhabitants[1]. Mankosi was recorded to have a population of approximately 11,000 people spread across twelve villages in 2012 [2]. The community leaders are arranged from Headman, who oversees twelve Sub-headman, each of whose homesteads serve as sites for local administration, from hosting weekly community meetings to discuss all local matters [2]. The community of Mankosi is filled with hills and transport is not an easy resource to find therefore community members have to walk up and down the hills to attend meetings.

The information will be categorized according to variety of meeting updates, topics, entertainment, technology, funerals and more. The objective of the project is to help the community members stay updated with valid information, opportunities provided by the local municipality or the king and meeting updates from the Sub-headmen. The different admins are the ones that are allowed to post news so that what is posted can be manageable. When new information is posted users get a clickable notification to view the original post, this will help pass important verified

information across the community. The platform will be made suitable for mobile phone users since in rural area most people don't own personal computers, the platform will be easily accessible when connected the Zenzeleni community network Wi-Fi or using mobile data.

## 2 RELATED WORK

Reitmaier et al [2] designed an asynchronous, oral repository with a sharing framework to allow users to record, store and share information within their group, in isiXhosa, with mobile devices [2]. It was recognized that a local communication system is more likely to be successful if both the design framework and the mechanisms used to implement it draw on current local communications patterns and meet constraints, such as access to technology [2]. The researchers worked with residents in a number of ways to identify ways a program can facilitate contact within and between villages. The comprehensive data collection included long conversations with mainstream political leaders and members of the community, and face to face interviews on the focus groups with some 200 residents on networking patterns, telephone usage and non-use, and unique telecommunications services.

The paper Introduction to Online Communities[4] discusses that It is found that online communities are mostly formed around a shared interest or need. The report provide an overview of the different forms of online communities, what makes an online community and the different resources of the web [4].

Foko et al [5]discusses about information and communication technology platforms deployment, the purpose of the study is to ascertain if the implementation of Platforms in the 14 areas namely (Ebenhaezer, Luwamba, Vukuzakh e, Marapyane, Sokhulumi, Devon, Wupperthal, Moretele, Verdwaal, Tswelopele, Dannhauser, Matlakeng, DonDonald and Sedibeng) [5] in South Africa to the Platforms that were designed to make a fundamental difference to computer literacy and associated skills in Africa [5] achieved the intended purpose of access, usage and maintenance. With time the platform evolved to a solar powered housing and the focus of the study, which provided people access to computers, mobile tablets and Wi-Fi. A study was conducted to see if the 14 stations implemented are maintained and used properly. With the study conducted it is shown that it is not necessary to deploy technology alone, but the role played by community leaders, qualified champions and technology users is crucial. The project was successfully introduced and gave many South Africans, who are now part of the information society, access to the ICT technology[5].

Communities have regarded the Networks as realistic instruments for building and bridging the Digital Divide byproviding easy access to the Internet and more educational content, the platform changed the lives of some rural people and broke down the wall of isolation[6]. For the project to be successful the following aspects need to be covered digital divide, known as the difference between individuals, households, businesses and geographical areas at different socio-economic levels, both in terms of their access to ICTs and in terms of their use of the Internet for a wide range of activities[6]. The paper show the importance of

strong leadership and the importance of making the people who own the project feel the ownership. The benefits of having community leader involved in the project so that they can maintain the system and be able to use it and teach other people how to use the system.

Chapter 3 of overview on social networking sites it discusses the storyline of social networks how they evolved email, IM (instant messaging) and SMS messaging through mobile phones to social media [7]. It further says with evolvement of time people wanted to share more contented at real-time, which now the simple way of SMS is seen a simple communication tool. The document explain how online communities moved a step further into connecting people and allowing users to share their thoughts, post pictures, videos and even invite people to events. Online social networking networks virtually bind to people who may or may not know each other. As a result, through text, audio and video, they enable quick information sharing, high levels of dialogue and collaborative communication[7]. The work is related to the project that I am doing, I try to link individuals and produce a platform where important content will be shared through amongst leaders and community members. The platform will be a space designed to facilitate communication, collaboration, and content sharing across users. It is identified that the main objective or aim of Social Networking Sites is to provide an engaging atmosphere for communicating with peers and gaining useful information [7]. The following aspects of Social Networking Sites are identified, The social network is for exchanging knowledge and networking, where users can read, download and upload useful information, to get opinions on different subjects by commenting on a subject posted, Other online social networking as MySpace, Facebook and etc, has focused attention on sharing information about one's personal life. For entertainment people share funny content. Socialization involves meeting individuals on a single forum, having mutual beliefs and communicating with each other. These forms of media are also used by academic bodies such as schools/college/universities and other organizations to provide information in the form of announcements and news about what is happening in their respective institutions[7]. It keeps us up-to-date about the latest events of users in culture, career, industry and workplace. Keep us informed about new products, the above help us identify the important aspect that are important to the user I am developing the system for and the platform I am building will offers the potential to facilitate the exchange of thoughts and ideas in a controlled environment without user losing concentration on funny stuff that can be posted on other platforms. The platform will have content that is not about one's personal life but the information about the whole village.

It will be worth considering mobile operating systems. Native application versus web application. In terms of time and expense, a mobile web application may simplify development. It was argued in [7] that the efficiency of native applications is observed only for high applications. Processing pictures or 3D games. It was also pointed out that it is widely accepted that native application languages are more complex than Web application languages. One of the web application drawbacks was that the standard web

application interface APIs were much slower than the native applications. Online app scaling on various platforms and devices has also been posed as a problem [7], but bootstrap will overcome it. Another area that has an impact on the creation of both native and web applications is user experience. For a native application, users will have different standards than for a web application. Web applications must be connected to the Internet all the but native applications can work offline as well as online.

### 3 REQUIREMENTS

List of registered users should be able to be retrieved.

The problem domain is that people in rural areas have no access to information and some information gets misinterpreted as people share it to one another. An online platform that shares relevant, accurate information and that is easily accessible by everyone with mobile phone and internet access will help make information accessible easy. This will help amplify and get accurate helpful information cross all the people in the villages easily on their phone. The aim of the project is to use the ICT skills to make easy reliable meeting update platform for rural areas. This will be a platform that is owned by the community and offers all the benefits of a social media platform, but with much more control and flexibility on how you communicate with your members. The platform will amplify the traditional ways of face to face meetings with the community and community leaders, through a digital platform for everyone to get updated at home while abiding by the government rules for covid-19. The community leaders with be the admins who will post the information to the platform and community users can access the information using their devices.

There are also pros and cons of a controlled communities, as with free communities. The platform is the to inform the community members and it will help to make leaders accountable since meeting tracking will be easier for community members to track promised made by the community leaders. One big advantage for owned group networks is that they give you greater control of your branding and advertising — without having to contend on the same platform with the noise from other communities. Users get content that is important and relevant to their needs, users can not get information that was not planned for them not to get everyone information will be processed by the admins.

#### 3.1 User Scenarios and Personas

The user scenario is about Onke and the challenge he might face and how he can go about it. Onke might have missed a meeting sometimes it is not reliable to ask someone to take notes for you.

## Persona

### User profile

**Name:** Onke

**Role:** community Member

### Attributes:

**Needs to get an update about what happened at the meeting.**

## User scenario

**Onke missed a meeting where the chief was talking about new developments because of work now he has no one to update him with relevant information that the chief has spoken about. He then asks the neighbor about the meeting he does not get all the information that was shared. So now he has to wait for another meeting in order for him to get the previous meetings brief.**

#### 3.2 User requirements for platform

From the user side the platform should be able to perform the following requirements

1. User should be able to login
2. The platform should allow the user to view post.
3. The platform should allow the user to comment on the posts.
4. The platform should allow users to use English and IsiXhosa.

From the admin side the platform should be able to perform the following requirements.

1. Login details should be stored in the database
2. Information should be retrieved and from the database after login.
3. Posted information should be stored in the database.
4. Posts should be retrieved from the database.
5. Posts should be able to be editable, deleted and saved back to the database.
6. Comments should be able to be accepted and declined

Upcoming events should able to be posted, be retrieved from database and be displayed

#### 3.3 Non-Functional Requirements

**Performance Requirements** - The system should upload the posted information and comments on the database on real time. It has to reflect on the end users in less than 1 minute. The system should be able to update and retrieve information from the data base in real time.

**Scalability** - The environmental capacity to meet the needs of growing numbers of consumers and public providers in a manner that is performance-predictable.

**Standard task** are the tasks that the user needs to do in order to successful use the system. The tasks were chosen because they are the tasks that are needed in order to successful make a post. If the user completed these task successfully it will mean that the system can achieve the objective it was design for which is to inform people. Failure to complete the task it will mean that the system has failed to meet the objective it was intended for. The benefits of these tasks are that, it will give us a way to measure performance of the system. From the user requirements from the admin sid we follow requirement 1 to 3. I can use these tasks as milestones for our project. It can assist us in knowing where to tackle a problem, e.g. if a problem occurs during registration, we will know that the registration task does not work. We can also use these tasks as a way to evaluate how efficient the system is.

**Table 1 Tasks and features**

Tasks	Features
Account accessing	To be able to read article and make comments the user needs to register an account and login.
Adding a post	You want to add a post of the platform, click post and add the news.
Popular posts	You want to want to read an interesting article the user can click and view the article.
Commenting	The user can comment on the article about how the view it
To-do- list	The user can check the upcoming events or meeting that will be held and with a date shown
Approval/rejections of a comment	User read a post and comment on it the admin will read the comment and accept or reject the comment

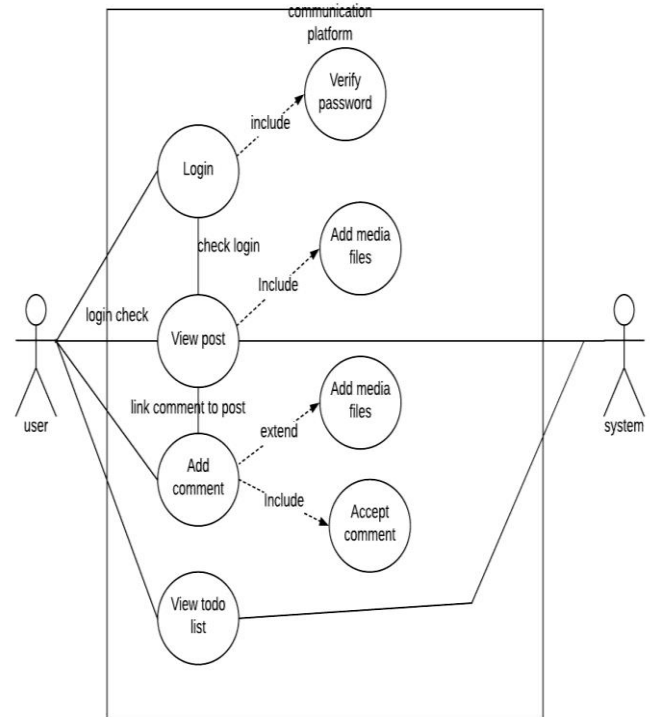
## 4 REQUIREMENTS ANALYSIS

The user opens the platform and looks for an update to learn about. As this is going to be in the language you prefer. If a post is selected, information will be populated on the interface from the back-end. Which is connected to the database which will give the request to the corresponding query and return it. The feedback is then shown on the platform interface in the form of text, audio, and video. Feedback will be returned in the language requested.

### 4.2 Use Cases

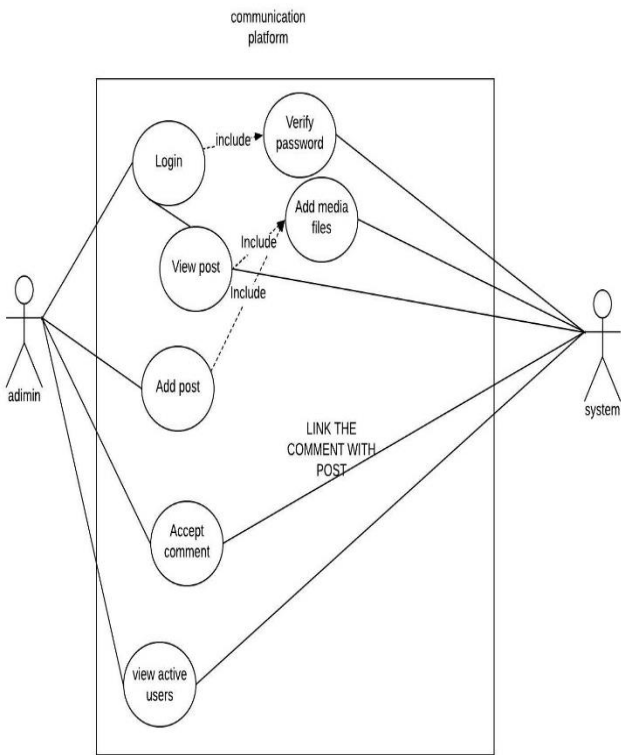
The platform will be able to provide users with the information posted by the admin about all the events happening in the community and the meeting minutes that are hosted by the Headmen and the sub-headmen. The platform can help delivery relevant information to the community of Mankosi in their own language. Users will be able to read posts and comments when

necessary add a voice recording of their comments, users will be able to view upcoming events, users will be able to view pictures of the article, listen to audio on the articles If is added and play a video of the article if is added. Users will not be able to post titles on platform, uses will not be able to remove posted information.



**Figure 1: Use Case Diagram of the Platform for the user**

The diagram shows the relationship between the user, and the interaction on the system. The diagram describes the functionalities on the system such as login, posts and other functions displayed below.

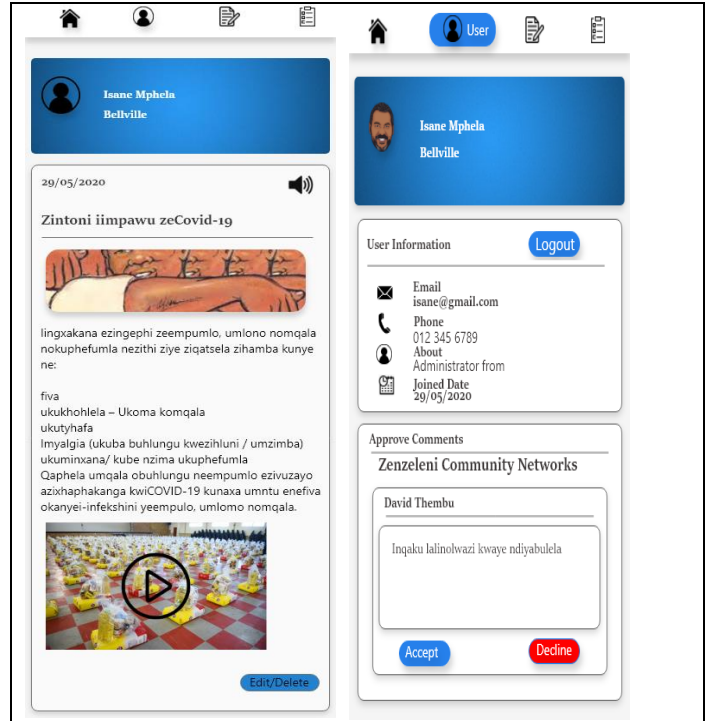


**Figure 2: User Case Diagram of the Platform for the admin**

The diagram shows the relationship between the user, and the interaction on the platform. The diagram describes the functionalities on the system such as login, posts and other functions displayed below.

## 5 USER INTERFACE

The user interface is designed with bright colors which is white, blue and grey. The text on the user interface is clear and users can be able to see the text clear. Inputs field and clear and visible as well. Figure 5 below show the design of the prototype, it has the navigation bar which is clear, the blue section show the user information, the speaker icon show the audio that can be played, then the article is displayed and it show the video that is posted with the article.



**Figure 5: User interface**

**Usability** – The design criteria used is the heuristics for user interface so that it can be easy to find usability flaws judging it using related known principles that makes user interface easy to use, so that the platform can keep the user informed all the time. The design is used so that the system can speak the user’s language, the system will be consistent throughout the system, the system has icons to help user remember the function of the buttons.

**Visibility** of system status -The system displays a list of posts which consist of the name of the person posted, the title and a short brief and a picture of the title. The predictability of the interaction also creates trust. For instance, when the user sees the hand navigator and recall similar sites if they have used them before, they predict that they can click on the item (picture/title for more information and when the user clicks one of the listed tasks, the user does get additional information, which is the article, the voice note and the video.

**User control** and freedom - The navigation bar clearly shows where the user is and the possible option to go to are easily clickable therefore users can go back and forth. Users have full control of which section to go to.

**Consistency** and standards - All sections of the platform have the same patterns. Header remains the same in all section as of the map. The design used is the same in all sections. The buttons are situated in the same position in all sections of the website

**Recognition** rather than recall - The user does not have to remember the function of each button as the buttons are clearly labelled what they do and do not have confusing icons which the user has to recall what the icons mean. The system provides the user with a list of the article with their name and picture clearly

stated and visible, hence the user doesn't need to recall the name of the article, they can recognize the title or the picture of the post. The system also provides the user with different sections which have type of articles clearly stated.

**Flexibility** and efficiency of use - All functionality is basic and simple and should be understandable by users of all levels of experience therefore the system does not need any subsystems or features in place to cater for the more advanced user, as this was not deemed necessary. The only additional site is for the admins.

### 5.1 Initial Prototype

The prototype has been developed to demonstrate the functions of the system. The prototype has two sides which is the user side and the admin side. It shows all the steps that will be taken for the admin to perform the main task and also steps the user's takes to perform main tasks. The first prototype was designed using Adobe XD. Adobe XD uses the designing components that can be used in both web and mobile design, the process is made even simpler. The second prototyped is coded and it can perform the requirement mentioned in the above section.

## 6 HIGH LEVEL DESIGN

Figures 3 & 4 show the relationship in the database and the relation between the how the tables are connected to each other. They show the classes and its attributes. The class diagram is designed according to the requirements of the system. The diagram displays what will be store inside the database and how are tables in the database linked together what types of entries will be accepted. The diagrams help to identify the functions the platform has such as create(), Delete(), Update(), and more it also shows who can perform what function.

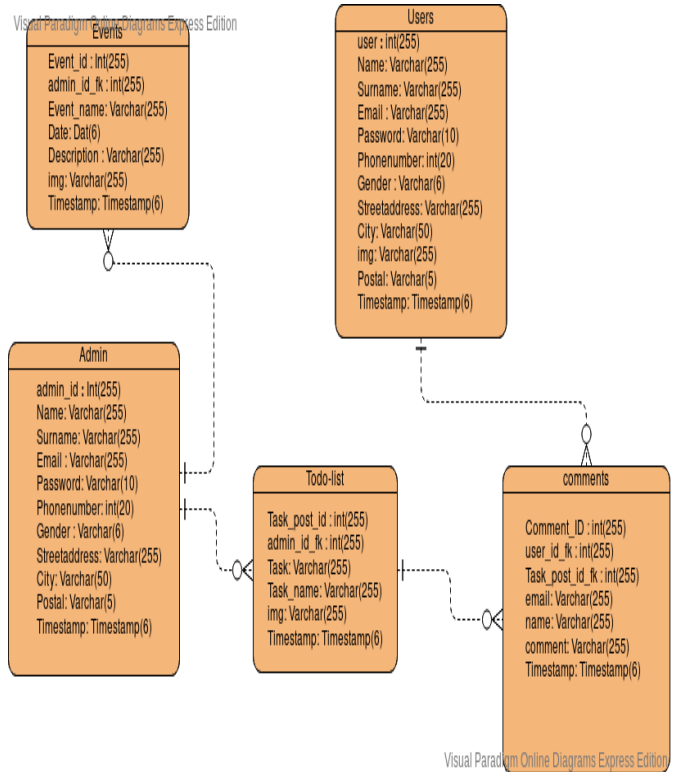


Figure 3: Entity Relationship Diagram (ERD)

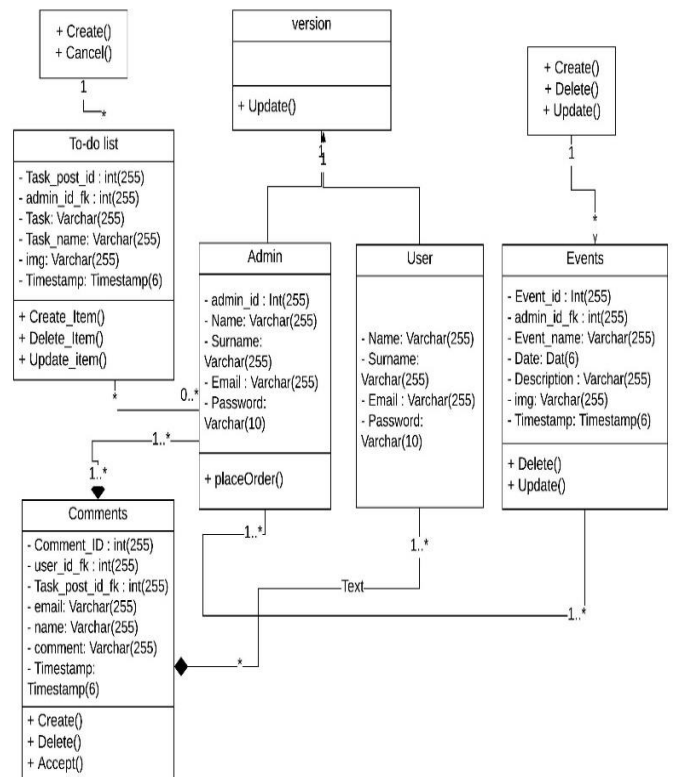


Figure 4: UML Class Diagram

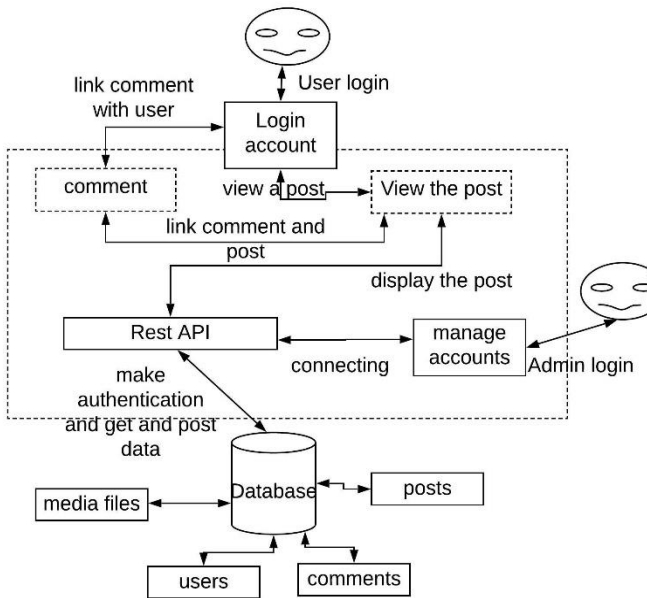
## 6 LOW LEVEL DESIGN

The administrators of the platform are the only people allowed to upload information, edit information, and delete information. It is important for the platform to have an administrator to regulate the group and post important information for users. The information posted will be categorized in section that will be easy to understand, to make it user friendly for old people who do not use social media platform.

The users can only access information that is posted by the administrators. Comment on the posts and the post can be reflected of the platform after the administration has accepted the comments. Users can view their user’s details and the also video the to-do list which is the list of the upcoming events like collection of food parcels, up community meetings dates and etc.

Fig. 6 show the design architecture of the platform. It consist of two modules which is user interface and the Rest API. Brief descriptions of each module are provided below.

Representational State Transfer (REST) API the helps the system to communicate and connects the client side with the server side. It is the HTTP protocol, the client send HTTP requests to the sever side. HTTP has standard methods which is GET for getting data, post for creating data, put for updating data and DELETE for deleting data. Headers are used to offer both client and server information. It can be used for a variety of purposes, such as authentication and the provision of body content information. The REST will have an authentication measures that will be in place to ensure that you only execute actions when authorized to do so. It stops you from getting you impersonated. In this project the rest API will be used to connect the frontend code the backend and the database to upload information and get information from the database. The database will hold voice notes, post, videos, and user’s information.



**Figure 6: Admin data flow diagram**

Fig. 6 show the design architecture of the platform. It consist of two modules which is user interface and the Rest API. Brief description of the each module is provided blow

## 7 IMPLEMENTATION

### 7.1 Hardware

The hardware that was used was not specific however a good performing computer is required to make the building process more smooth and faster. In this project a Lenovo laptop was used, running on Windows 10, processor Intel inside 4GB ram.

### 7.2 Software

There were various types of software that had to be installed on the personal computer to complete or move forward with the project. The main software used to develop the application were Microsoft Visual Studio, Android Studio SDK, Expo app and Xampp. The selected device to support the app will be an Android phone. The tool used thus far to develop are PHP, MySQL Database, CSS, and JS.

To implement the platform first the code is divided into various scripts written in PHP and there are different functions / methods / classes in each script. Each class is called by the function it is supposed to do and each script is saved by the class name. The landing page was created showing the records from the post database table. A file named "create.php" was created and coded to generate a web form that can be used to insert records in the post table. A file named "get.php" is coded to retrieve the records from the post table based the id attribute of the admin. A file named "delete.php" is coded to delete the records from the post table based the id attribute of the admin. A file named "update.php" is coded to update the records from the post table based the id attribute of the admin. The project has a frontend, backend and a database. The database has tables that are created using MYSQL. Functions from the admin side are created as connection functions which are used to connect the database of the platform. The Delete function is used by the admin to delete data in the database using PHP. The Insert function is used to insert data from the platform to the database. The delete\_comment function is also used to delete comments from the database. The functions used by the users are connect function and insert\_comment function. Node modules are installed in order to make JQuery function working. That is the backend side of the platform. This is coded and the parts that are left to code are to create the Android front-end and link it to the back-end so that it can be fully operational.

### 7.3 Functions, Methods and Classes

The implementation of the mobile development was done in three iterations: First phase, Second phase and Final phase.

The login this class generates the platform's first screen, which is the login screen. It uses text input by default to get user name input and text input to get user password with password protection. The



text input password protection masks the text during the input process. User credentials are submitted for authentication to a web server.

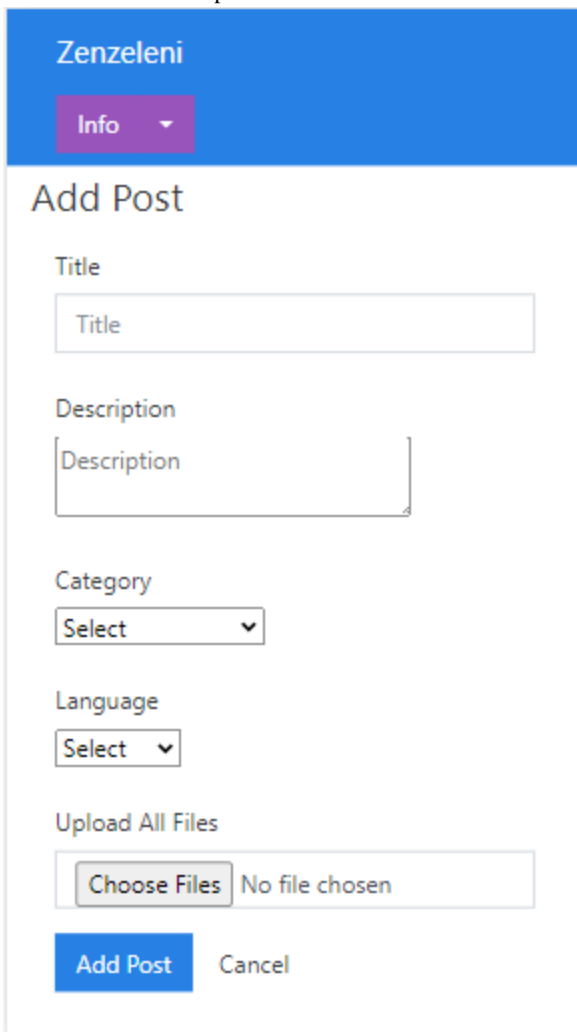
When users navigate from the login screen to the home screen, DownloadActivity generates an in-between loading screen. The key feature is to display a tab to load when uploading the posts that are reported to the username in the background.

The homepage generates the platforms home screen, which is the first screen that is seen after the website is loaded. The latest updates that the admin has written are highlighted.

The Upload generates an upload screen on the menu bar that is to the left of the home screen. You can do this by swiping from the home screen to the bottom or by touching the upload menu on the navigation panel. This fragment manages the file and text uploading process.

**Final Interface**

The updated interface this where the admin will upload and post the information. The admin needs to enter the title, description, category, language, and the multiple files (image, audio and video) and the click the Add post.



**Processing data**

In this section the when the user enters information and files (image, audio and video) to be uploaded the first function is to check if the required inputs are entered before proceeding. Then a for loop to store and check different file types is generated so that each file type can be stored in its right place. A directory is created for each files so that it can be stored in the database for future referral. The files are then uploaded to the storage with the same directory that is stored in the database for it to be retrieved used the directory in the database.

```

$extensions = array("jpeg", "jpg", "png");
$extensions1 = array("mp3", "ogg", "flac");
$extensions2 = array("mp4", "avi", "3gp", "mov", "mpeg");

// store an image
if (in_array($file_ext, $extensions) == true) {
    $file1 = $_FILES['feat_image']['tmp_name'][$i];
    $name1 = $fileName;
    $msg1 = "You chose image file";
    echo "<script type='text/javascript'>alert('$msg1');</script>";
}

// store an audio
if (in_array($file_ext, $extensions1) == true) {
    $file2 = $_FILES['feat_image']['tmp_name'][$i];
    $name2 = $fileName;
    $msg2 = "You chose audio file";
    echo "<script type='text/javascript'>alert('$msg2');</script>";
}

// store a video
if (in_array($file_ext, $extensions2) == true) {
    $file3 = $_FILES['feat_image']['tmp_name'][$i];
    $name3 = $fileName;
    $msg3 = "You chose video file";
}

// move the files to the storage
move_uploaded_file($file1, "Zenzeleni/all/assets/featuredimages/.$name1");
move_uploaded_file($file2, "Zenzeleni/all/assets/audio/.$name2");
move_uploaded_file($file3, "assets/video/" . $name3);
    
```

**Figure 7: Code to post**

**Upload to database**

The main function of the platform is to provide the Zenzeleni community with relevant information based on the meetings that are held and new updates that are made by the chief. The dataset is created to then be populated by relevant information and when it is in used it will then be populated by the real minutes that are recorded from the meetings held with the community leaders. The information is stored in a MySQL database in different tables. In order to upload and download data from the mobile application to the database, a web service is required.



```

// insert the information in the posts table in the mysql database
$sql = "INSERT INTO posts
(title, description, category, feat_image, user_role, feat_audio,
language, feat_video) VALUES
('$title', '$description', '$category', '$full_url', '$id', '$full_url1',
'$language', '$full_url2')";

// make the query to the database

$query = $con->query($sql);
if ($query) {
    // go to the dashboard page after posting
    header('Location:dashboard.php');
} else {
    // echo "Failed to Upload Image";
    $msg = "Failed to Upload Image";

```

Figure 8: MySQL

## 8 TESTING

An important part of any software application that has user interaction is the user interface. And if the industrial design and its aesthetic are enticing, it would be of no benefit to the consumer if it does not meet actual user needs. It is important to continuously validate and optimize the concept by communicating with the real consumers. It is important to use various approaches and practices to figure out what matters to users. A concept is the most efficient way to get customer input on the interface.

Minimal testing has been done so far, including unit testing, which is user-friendly and accessibility. I also tested the quality of the product and the user interface. To test for sophistication and consistency, I did a lot of testing on the code. Basically, instead of being tested by other users, this form of testing was done by the developer on development. In the fourth term further development and testing will come as the platform is getting ready for deployment.

### 8.1 Heuristic Evaluation and User Testing

In the evaluation and user testing process, three HCI experts and five users participated. For both evaluation and user testing, the platform was installed on a Nokia 2.2.

For a heuristic evaluation, three HCI experts were consulted separately. The MSc expert in Information Technology was first consulted, and then two of the BSc specialists in Computer Science were next consulted.

### Evaluation

On the upload page, it was pointed out that the already uploaded files were not shown in the post view. The upload screen only had text showing that the files were transferred, but did not display the uploaded files when the files were uploaded to the server.

### Implementation

The upload and display of the files was addressed to make the project run smoothly.

### Evaluation

Removing the notification area and incorporating it as an external button at the top of the screen was proposed. To stop too much text on the navigation bar, the justification was given. Initially, the post was criticized and it was recommended to move to a card style.

### Implementation

The navigation was omitted and restored to the top of the screen next to the refresh button as an action button. It displays the drop-down menu when it is pressed. A proper card style has been introduced and it is properly organized the view post page

### Evaluation

It was suggested that I shouldn't have multiple inputs forms for the files e.g. have an input section for image, audio and video separately but to have input section that takes multiples files.

### Implementation

The suggestion was implemented and the platform has one input section to take multiple files.

## 8.2 User Testing

Five users were asked to do different platform activities. These five users were: safety guard, student of computer science, student of Bcom, professional athlete, and student of BA. All five users were smart phone users who were optimistic. Among the five users, four were able to speak the IsiXhosa language. The users were given a table with a series of tasks and were asked to complete the task using the platform and score the task 's complexity on a scale of 1 to 5 where 1 is incredibly simple and 5 is incredibly hard.

Task	User 1	User 2	User 3	User 4	User 5	Average
Navigate to post screen	3	1	2	3	1	2
Upload result files and text	5	3	4	3	4	3.8
View the post	3	1	1	1	1	1.4
Add comment	2	1	1	1	1	1.2
Play audio	1	1	1	1	1	1
Play video	1	1	1	1	1	1
Exit application	1	1	1	1	1	1

With that dataset provide it is worth noting that tasks 1 and 2 seemed to be the hardest task for the users.

## 9 Implementation Challenges

The biggest challenge in integrating the platform was to learn PHP in a limited time span for the backend and also Android. Only the essential knowledge of managing the platform was gained and two difficulties were found due to the lack of knowledge.

Hosting the platform independently from the main database was the first problem. It did not access the database because the site was hosted separately. The error was unauthorized access and the access settings were difficult to modify.

One of the challenges was to run programmes of android studio. Initially I tried react native however the packages to long to install and it the computer was very slow to run the packages and the pages. I worked with android studio only the same challenge was face the computer would just stack without moving forward. However I come up with method that made the project to be successful.

## 10 CONCLUSION

This project turned out to be a valuable experience in software development. The theory of how the development should be carried out and the things that can go wrong in the development process were experienced firsthand. Many little challenges were encountered and the understanding of why managing software development is not an easy task grew during the course of this project. In the final version, the key feature of uploading files and text was successfully implemented. Other features: viewing post content, playing audio, playing video, checking all users from the admin side, and switching the language have also been implemented and tested to be working properly. To complete the

project on time, the scope of the features and functionality of the features had to be scaled down.

Future work will include perfecting the functionalities of the platform adding more feature, integrating the database with the other project under Zenzeleni to make one big database that everyone can makes functional calls from.

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