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**FACULTY OF SCIENCE AND EDUCATION**

**DEPARTMENT OF COMPUTER SCIENCE**

**TITLE: AN ONLINE FEEDBACK SYSTEM**

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A research report submitted to the faculty of science education in partial fulfillment of the requirements for the award of the degree of Bachelor of Science in computer science at Busitema University.

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## **DECLARATION**

I, Tibitondwa Jane declare that the work presented in this research report is my original work and has not been submitted to any university or institution of higher learning for any academic award. Each contribution to, and quotation in, this Report from the work of other people has been attributed, cited and referenced.

Signature..... Date.....

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## **APPROVAL**

This report has been submitted for Examination with the approval of the following supervisor.

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Date.....

DR. LUKYAMUZI ANDREW

(Supervisor)

## **DEDICATION**

I would like to take this opportunity to dedicate this report to the staff at Busitema University and the persons that were very helpful, extended their valuable guidance and help whenever required for the project which I worked on. I also dedicate this report to my Supervisor Dr. Lukyamuzi Andrew for his valuable guidance and training during this project. Finally, I dedicate this report to my beloved parents Mr. Basuta David and Ms. Nakasango Florence.

## **ACKNOWLEDGEMENT**

I wish to express my sincere gratitude to my project supervisor, Dr. Lukyamuzi Andrew for his guidance, constant support and encouragement throughout the completion of this year's project. I would like to convey my appreciation to all Lecturers in the Department of Computer Studies for every precious advice that they gave during the system preview of the final year project. A warm thank is extended to my classmates for kindly sharing out their resources, opinions, knowledge, experience, skills in programming and development methodology with me so generously.

Last, but not least, I wish to acknowledge the unwavering support shown by my family members who were always there to give me endless support whenever I needed it.

## **ABSTRACT**

Until recently, creating and conducting an online survey was a time-consuming task requiring familiarity with web authoring programs, HTML code, and scripting programs (Wright, 2005). Today, survey authoring software packages and online survey services make online survey research much easier and faster. (Mertler, 2002) observes that while online data collection is currently little used to get feedback, it is an efficient and convenient alternative to the more traditional method of gathering information from students, teachers and parents. , (Schleyer & Forrest, 2000) reports that researchers across disciplines were realizing the benefits of data collection using the internet. As a natural progression of that trend they observed that journals were also widely publishing research papers based on data that had been collected online. According to my research, studies have shown that most students suffer from miss communication during verbal communication, high costs while printing, communication not being effective since it involves physical reach out of students, a lot of time spent during communication, and communication can be altered in some cases. I have developed an online feedback system that will enable staff to post information, students to view information, and students to give feedback in comments in an easy and effective way.

I used RAD and prototype methods of development because the system was developed in modules and reviews were made per module with respective stake holders hence favors modular development. MySQL is the database that I used, the core IDE for development was VScode, server side scripting language was PHP 7.2 and client scripting was JQuery 3. The system can be accessed via web browser by the secure URI.

This report uncovers the details relating to the development and implementation of an online feedback system applied at Busitema University. The online feedback system uses an online data collection format to return data that is analyzed to provide information about the evaluation of courses, teaching, results, and security, among others that take place at the University. This OFS will deliver the university administration from the arduous work of physically reaching out to students in order to retrieve their views.

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## **ACRONYMS**

SDLC	Software Development Life Cycle
BU	Busitema University
ERD	Entity Relationship Diagram
DFD	Data Flow Diagram
SQL	Structured Query Language
PDF	Portable Document Format
GB	Giga Bytes
DB	Data Base
MYSQLi	My Structured Query Language Improved
OFS	Online Feedback System
FSE	Faculty of Science and Education

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## **CHAPTER ONE**

This is the first chapter that consists or covers the introduction, background, problem statement, objectives, significance of the study, and the case study of my research. This chapter elaborates more on how communication is performed in the day-today life, the problems that are faced during communication and feedback of the communication, and how I solved the problems facing feedback during communication specifically in Busitema University, Nagongera campus. The case study of my research was Busitema University, specifically Nagongera campus.

### **1.0 Introduction**

In the communication world today, there is what we call Communication process, and in this type of process, it consists of mediums through which you can send a message to its intended audience. There are key components in this communication process and these include: encoding medium, transmission, decoding, and feedback. These components enable transmission of a message, where one can send a message to the intended recipient and then this person replies to the message (this is called feedback) through the communication medium.

However, due to challenges faced by Communication Process in Busitema University forexample: high costs, a lot of time spent, miscommunication, the communication not being effective, I have developed a software(Online Feedback System) that will support review platforms and effective communication in Busitema University.

### **1.1 Background**

Students' feedback is considered a necessary tool for quality assurance. The information obtained can then be used to make necessary adjustments in the school's programs as a criterion for better service delivery. In the existing feedback system used at Busitema University, students are provided with forms that are filled usually after an examination since this is one of the few times that college students can collectively be accessed. The forms are then manually entered into the database for further analysis. This whole process is strenuous and time-consuming as compared to an online feedback system. Also information is communicated verbally to the coordinators or it is posted on the notice board physically. This process is tiresome and most students miss out on the information because they are lazy to reach the notice board or the coordinator communicated to a few people.

The online feedback system simplifies the process of data entry into the database since it's configured to automatically transfer data into a database therefore eliminating the need of manually entering the data. The system is an efficient and cost-effective approach to data collection and enables generation of useful information on time.

## **1.2 Problem statement**

In the current system there is Verbal communication in that communication is given to a coordinator to pass it to the rest of the students, Paper based in that information for example student's results or timetable is posted on the notice board for students to physically reach there, and Physical reach out to students.

However, there are several challenges in this communication process and these include: High costs in printing the paper based information, a lot of time spent while students have to move from their respective residents to go to the notice board so they receive information, the communication sometimes is not effective in that not all students will receive the information that is passed on, and lastly the communication can be altered fore example when the coordinator is passing of the communication verbally, he can miss out on something important.

In my research, I have developed an electronic feedback system that enables staff members to pass on information in an easy and effective way. For example Staff can post information, Students can view information, and Students can give feedback in comments.

## **1.3 Objectives**

Main objective

To create a unique and useful "Online feedback system" with exceptional quality and service that differentiates it from other feedback systems.

Specific objectives

1. To determine requirements of the proposed system (needs assessment).
2. To design the proposed system (Logical).
3. To implement the proposed system.
4. To Evaluate, Deploy and offer Tech. Support to other stakeholders.

## **1.4 Significance of the Study**

- The research will provide Students and Staff with a complete secure platform where they will get and provide information about the basics that are going on in the university.
- It will serve as a useful reference material for other researches seeking the same research discipline.
- The main purpose of this project is to develop a computerized system that will enable the utilization of the internet in the collection of students' feedback. The feedback can then be used in evaluating the different courses and teaching at Busitema University in order to make informed decisions.
- The study will also help the researcher fulfill the requirements for the award of degree of Bachelor of Science in Computer Science.

## **1.5 Case study and Scope**

The project product is an online feedback system to retrieve student's views. The case study in this project is Faculty of Science and Education, Nagongera Campus, Busitema University.

This platform is purposed at bridging the gap between the students and the staff at the University. The research lasted for five months and two weeks.

## **CHAPTER TWO: LITERATURE REVIEW**

The second chapter basically shows or consists of critical review of research work from journals, internet sources and other projects already done which is related to the Feedback system as well as an analysis of existing literature on the feedback systems with the objective of revealing contributions, weakness and gaps. It also elaborates the different types of Feedback systems, the need for an online feedback system, and the architecture of the system: requirement, components and characteristics, the advantages of online data collection, limitations of online data collection, the determinants of a successful online survey, and security concerns with an online feedback system.

### **2.0 Introduction**

This section consists of a critical review of research work from journals, internet sources and other projects already done which is related to the Feedback system as well as an analysis of existing literature on the feedback systems with the objective of revealing contributions, weakness and gaps.

The number of internet users is growing at an ultra-speed. This has compelled many organizations, firms to opt for the online data collection methodology to retrieve feedback from customers.” The concept of customer” means not just the paying customer but anyone who receives the benefit of goods and services including patients in hospitals, students in school. Customer feedback is necessary for performance management (Zairi, 1992). (DeFranzo, 2015) defines feedback as a term used to describe the helpful information or criticism about prior action or behavior from an individual, communicated to another individual (or a group) who can use that information to adjust and improve current and future actions and behaviors. (Møller & Barlow, 1996) reported that one of the most direct and meaningful ways customers can express their dissatisfaction to companies is through what we have come to call a complaint. Complaints provide a feedback mechanism that can help organizations rapidly and inexpensively shift products service style and market focus to meet customer needs. (Møller & Barlow, 1996) and (Wirtz, Tambyah, & Mattila, 2010) reported feedback as a means to identify problem areas and strengths, and generate ideas for service improvements. When knowledge at the individual level is transmitted and translated to form organizational knowledge, it can then be effectively managed and utilized as an organizational asset (Wirtz, Tambyah, & Mattila, 2010). (Berry &

Parasuraman, 1997) noted that the firms intending to improve services need to listen to three types of customers 1) external customers who have experienced the firm's service, 2) competitor's customers who the firm wants to make its own and 3) internal customers who depend on internal services to provide their own services. Effective feedback, both positive and negative, is very helpful since it's a tool for continued learning and can also motivate the receiver (DeFranzo, 2015). A common perception in the information age therefore, is that researchers can focus more of their efforts on analysis of data instead of getting frustrated with the process of data collection itself.

## **2.1 Feedback systems**

An online feedback system can be either computerized or Non-computerized. A feedback system is one which utilizes presently achieved output of the applied input signal in order to get the required output. Generally, these systems are used to provide more corrective response, by comparing the achieved output with the applied input.

As earlier mentioned in chapter one where we described the non-computerized systems, we shall now elaborate the computerized system clearly stating their contribution weaknesses and gaps some of which I used to build the Online feedback system.

## **2.2 Need for an online feedback system**

Feedback is a great enforcer for learning and achievement. It has a major influence on students' academic success. Positive feedback has the power to initiate further action and it improves both teaching and learning. Feedback and instruction are intertwined. It is as important as instruction because it gives new information about students' understanding of a fact or achievement of a skill. Feedback provides new information specifically related to the task or process of learning that fills a gap between what is understood and what is aimed to be understood. Hence feedback is an essential part of effective learning. It helps students understand the subjects better and gives them clear guidance on how to proceed with their learning.

Given the above problem statement, we resort more on the system being computerized than non-computerized to enhance the effectiveness of the feedback. Hence, the need for an online feedback system which I developed.



## 2.3 Architecture of the system: requirement, components and characteristics

The software requirements specification is produced at the culmination of the analysis task. The function and performance allocated to software as part of the system engineering are refined by establishing a complete information description, a detailed functional and behavioral description, an indication of performance requirements and design constraints, appropriate validation criteria, and other data pertinent to requirements.

Requirements of the online feedback system that I developed can be broadly classified into two:

### 1. Functional requirements.

These address specific requirements of feedback architecture. They are specific to each component used in that feedback system based on their application. A good example of systems built using such components is the Busitema student portal system.

### 2. Non-functional requirements.

On the other hand, they are not very specific. Nonfunctional requirements refer to attributes based on which the quality of the feedback system can be determined. On a broader perspective, non-functional requirements can be classified into two:

- Performance requirements. Due to the large number of verticals involved in designing a complete online feedback system, performance requirements can be further classified into software and hardware requirements.
- Ethical requirements. The code of ethics and professional conduct highlights ethical values such as trust, honesty, responsibility, respect and fairness. Trust, honesty, responsibility, respect, and fairness are critical values that create harmony and professionalism in teams, which in turn lead to my project success. In an ever-changing world, especially in project management where there is a new methodology or process launched into the profession every year, these core values are something people can hold onto.

## 2.4 Advantages of online data collection

The advantages and limitations of online data collection are expounded on by a number of researchers which include the following;

✚ **Time:**

(Bachmann & Elfrink, 1996) emphasizes how online surveys allow a researcher to reach thousands of people with common characteristics in a short amount of time, despite possibly being separated by great geographic distances. A researcher interested in surveying hard-to-reach populations can quickly gain access to large numbers of such individuals by posting invitations to participate to newsgroups, chat rooms, and message board communities. In the face-to-face research environment, it would take considerably longer-if it were possible at all-to find an equivalent number of people with specific attributes, interests, and attitudes in one location. Online surveys may also save time by allowing researchers to collect data while they work on other tasks (Llieva, Baron, & Healey, 2002). Once an invitation to participate in a survey is posted to the website of a community of interest, emailed to people through a listserv service, or distributed through an online survey research service, researchers may collect data while working on other projects (Nonnecke, Preece, & Andrews, 2003). Responses to online surveys can be transmitted to the researcher immediately via email, or posted to an HTML document or database file. This allows researchers to conduct preliminary analyses on collected data while waiting for the desired number of responses to accumulate (Llieva, Baron, & Healey, 2002). . (Franceschini III, 2000) also reported reduced turnaround time. In his study, half of the respondents were sent mail surveys, the other half were surveyed via the Internet. He reported that 21 of the 29 Web-based responses were received before there were any responses to the traditional mail survey.

#### **Cost:**

(Bachmann & Elfrink, 1996) share the opportunity survey researchers have to save money by moving to an electronic medium from a paper format. Paper surveys tend to be costly, even when using a relatively small sample and the costs of a traditional large-scale survey using mailed questionnaires can be enormous. Similarly, conducting online interviews, either by email, or in a synchronous “chat” format, offers cost savings advantages. Costs for recording equipment, travel, and the telephone can be eliminated. In addition, transcription costs can be avoided since online responses are automatically documented. Newer online survey creation software and web survey services costs can vary from very little to thousands of dollars depending upon the types of features and services selected; however, this is relatively inexpensive compared to the cost of traditional paper-and-pencil surveys (Wright, 2005). A traditional paper-and-pencil survey would

have included costs for questionnaire administration including paper, printing, postage, training, travel costs and costs for data entry (Granello & Joe, 2004).

**+ Ease of data entry:**

(Granello & Joe, 2004) reports the traditional paper-and-pencil surveys data entry to be extremely expensive and time-consuming. An electronic survey can be configured to send data to a database or spreadsheet, eliminating the need for manual data entry. This also eliminates potential errors in rekeying data. The use of a paper-and-pencil format demands the time-consuming manual procedure of entering the responses into a data file. The chances of human error during this procedure are obvious.

**+ Flexibility and control over format:**

Moreover, researchers can control the order in which respondents answer the questions more easily than with paper-and-pencil surveys, which allow respondents to flip back and forth among the pages and change answers (Wyatt, 2000).

**+ Recipient acceptance of the format:**

There is some evidence that the Internet is becoming more acceptable to respondents as a method of collecting data, particularly for men (Dillman, 2000) and for individuals who are college educated (Franceschini III, 2000). Several authors have noted that self-disclosure is increased when people communicate using Web-based surveys as compared with traditional paper-and-pencil surveys (Granello & Joe, 2004) found that an Internet survey offered the necessary assurances of anonymity to allow respondents to give accurate data surrounding very sensitive health issues, which is particularly relevant for researchers in the field of mental health where sensitive data is also collected. With traditional paper-and-pencil surveys, researchers can only see the results of the participants' responses. Using the Web, researchers can learn about the respondents' answering process (Bosnjak, 2001). For example, with Web-based surveys, researchers can identify the number of people who viewed the survey compared with those who completed it or, if the software will allow, the number of people who started the survey but did not complete it.

## **2.5 Limitations of online data collection**

Problems such as multiple email addresses for the same person, multiple responses from participants, and invalid/inactive email addresses make random sampling online a problematic method in many circumstances (Couper, 2000). Unless the Web-based survey uses a sampling method that allows

only certain individuals to access to survey, it is impossible to know the response rates. For example, when participants for electronic surveys are recruited via newsgroups search engines, or electronic mailing lists, researchers are not able to pinpoint the number of individuals who received the information, and therefore they cannot determine response rates nor speak to the representativeness of the sample (Schleyer & Forrest, 2000). To circumvent this difficulty, many Web-based surveys make use of an initial e-mail to a targeted group that contains a specific URL to access the survey. This e-mail can also include an access code, password, or PIN to ensure that only those who have been targeted can complete the survey and to prevent any individual from completing the survey more than once (Wyatt, 2000). The participation rates are low compared to those generally seen in traditional pencil-and-paper surveys (Lefever, Dal, & Mathiasdottir, 2007).

## **2.6 The determinants of a successful online survey**

(Carbonaro & Bainbridge, 2000) points out that easy access to surveys for all participants is essential in online data collection. Also, web surveys must be designed in such a way that they are simple to complete. Secondly, web surveys must have a built-in security system to ensure credibility and anonymity and finally, web surveys should require only a minimum of computer skills for their completion. (Comley, 2000) names three factors that affect response rates in online surveys: (1) style of the first page of the survey, (2) relationship with the website/brand and (3) respondent interest or relevance of the survey.

Equipment and Know-How. In order to collect data online, the evaluator must have access to the equipment and technical know-how to accomplish the task. Web servers, database programs, and technical expertise are all needed, in addition to the traditional knowledge of an evaluation office. Passwords and other control techniques, which are used to ensure the integrity of respondents, require time, expertise, and expense (Stanton, 1998).

## **2.7 Security concerns with an online feedback system**

A security concern of an asset is a function of threat and vulnerability of that asset.

Types of security threats.

- **Malware.** This is malicious software such as spyware, ransom ware, viruses and worms. This is activated when a user clicks on a malicious link or attachment, which leads to installing dangerous software. Cisco reports that malware once activated can; block access to key network components(ransom ware), install additional harmful software, disrupt individual

parts, making the system inoperable, covertly obtain information by transmitting data from the hard drive(spyware)

- Denial of service. This is a type of threat that floods a computer or network so it can't respond to requests. A distributed denial of service (DoS) does the same thing but the attack originates from the computer network.
- Man, in the middle. This attack occurs when hackers insert themselves into a two-party transaction. After interrupting the traffic, they can filter and steal data, according to cisco.
- Phishing. This attack uses fake communication, such as email, to trick the receiver into opening it and carrying out the instructions inside such as providing credit card number. 'The goal is to steal sensitive data like credit card and login information or to install malware on the victim's machine', cisco reports.
- Password attacks. With the right password, the attacker has access to the wealth information. Social engineering is a type of password attack that data insider defines as "a strategy attacker use that relies heavily on human interaction and often involves tricking people into breaking standard security practices." Other types of password attacks include accessing a password database or outright guessing.

A password will be a key security requirement in the online feedback system. Data, which includes private information about the user, needs to be shared only with authorized users.

I will implement at least two-level authentication in the system to ensure the identity of a specific user.

## **2.8 Conclusion**

Online data collection methodology is an effective and desirable technique to retrieve feedback since many researchers regard it as less costly, timely as compared to the traditional approaches. However, the findings above do not entirely bring out the relevance of an online data collection system to retrieve feedback on behalf of an organization. Further research is needed to investigate the impact of students' feedback on the performance of an institute.

## **CHAPTER THREE: METHODOLOGY**

### **3.0 Introduction**

This chapter presents the methods the Researcher used to collect accurate data for report writing and for developing the system. It also identifies and compares the tools used for data collection, analysis, design, and implementation. It also finally validates the use of the Online Feedback System.

### **3.1 Research design**

The Researcher chose a survey research design because it best served to answer the questions and the purposes of the study. The survey research is one in which a group of people or items is studied by collecting and analyzing data from only a few people or items considered to be representative of the entire group. This means that, the Researcher chose a part of the population, for example, 20 people were chosen to represent the entire population of 1000 people at the University because these 20 individuals were present while the Researcher was carrying out the survey but the rest of the population was absent. Another reason is that the entire staff (15 individuals) at the Faculty of science and education work in shifts (some are present at the beginning of the week and the others are present when the week is ending) so it was difficult to take sample the entire population. And as a result, the findings from the 20 individuals were expected to be generalized to the entire population.

### **3.2 Area of Study**

As earlier mentioned above that the area of study was Faculty of Science and Education, Busitema University, the Researcher developed a good alternative method of the staff effectively communicating with the students and the students giving effective feedback through the development of a computerized system. This System is currently used to communicate with the students by the staff. Students' complaints can be submitted using this platform and they can get feedback from the staff.

### **3.3 Population and Sampling**

The target population included a group of students at Busitema University. The population was broadly divided into the following groups; students that were admitted at the faculty of science and education, staff working at this particular faculty, and other departments of the University.

The students were considered appropriate as population of the study area because, as stated in chapter one, they are the ones that are directly involved during the communication process at the University and their views have to be worked upon. The staff were considered too because they interact so often with the students and that's what makes up a college. In addition, other staff (security personnel, cleaners, librarians among others) have had a big in the university and therefore, they were best fit to feed the Researcher with the information that was needed to answer the question about how the communication in the existing systems is effective or not.

<b>Strata</b>	<b>Total number of people in the strata</b>
Staff (lecturers, AR)	30
Students	1000
Other staff(security personnel, cleaners, librarians among others)	20
<b>Total</b>	<b>1050</b>

*Table 1: Showing the sample population size at FSE, Busitema University.*

### **3.4 Sampling techniques**

A stratified random sampling procedure was used for selecting the participants in this study. This technique was employed to ensure a fairly equal representation of the variables for the study. The stratification was based on the number of university staff and students in Busitema University, Nagongera Campus. Within each section, selection of individuals was by simple random sampling. This was achieved by writing out the names of the staff in piece of paper which was folded and put in a basket. After thorough reshuffling, the researcher selected an element, recorded it and then placed it back in the basket until the required number is obtained. That is to say, the researcher applied sampling with replacement. Proportionate stratified random sampling technique was employed to select 10 university staff and 20 university students from all the departments at the university. The proportionate stratification was based on the fact that there were more students than staff in the university.

### **3.5 Data Collection**

The Researcher used the following methods during data collection: Observation, Interviewing, and review of the existing documents.

### 3.5.1 Interview method

This was achieved using a one-on-one interaction between the data collector and the interviewee (respondent) to get the required information. Some university staff (5 lecturers and 3 HODs) and the students (20) in numbers were interviewed to get their perception about how useful or tiresome the current or existing feedback system is. This helped the Researcher to take the decision of developing the standard computerized feedback system for effective communication between the staff and the students.

### 3.5.2 Observation

The Observation tool was used because it made it simple to extract information without necessarily asking respondents and thus it saved time. It also helped to cross check the answer that was given by respondents through the Interview.

### 3.5.3 Review of the Existing documents

This instrument of data collection consisted of using mainly literature from other scholars that was got from the library, journal articles and Publications online. These documentations gave clues about how far the research about feedback has gone and what needs to be done to solve the challenges.

### 3.6 Method of data analysis

The data collected from the field was analyzed. Statistically weighted mean was used in answering the research questions. The response options in the instrument are weighted as shown below:

Strongly Agree (SA)	Agree (A)	Disagree (D)	Strongly Disagree (SD)
4 POINTS	3 POINTS	2 POINTS	1 POINT

*Table 2: Showing the response options and how they were statically weighed*

### 3.7 Ethical Considerations

The main ethical considerations that were considered during the study were;

- Seeking permission from the Faculty Dean of Nagongera Campus before collecting data from all the respondents.



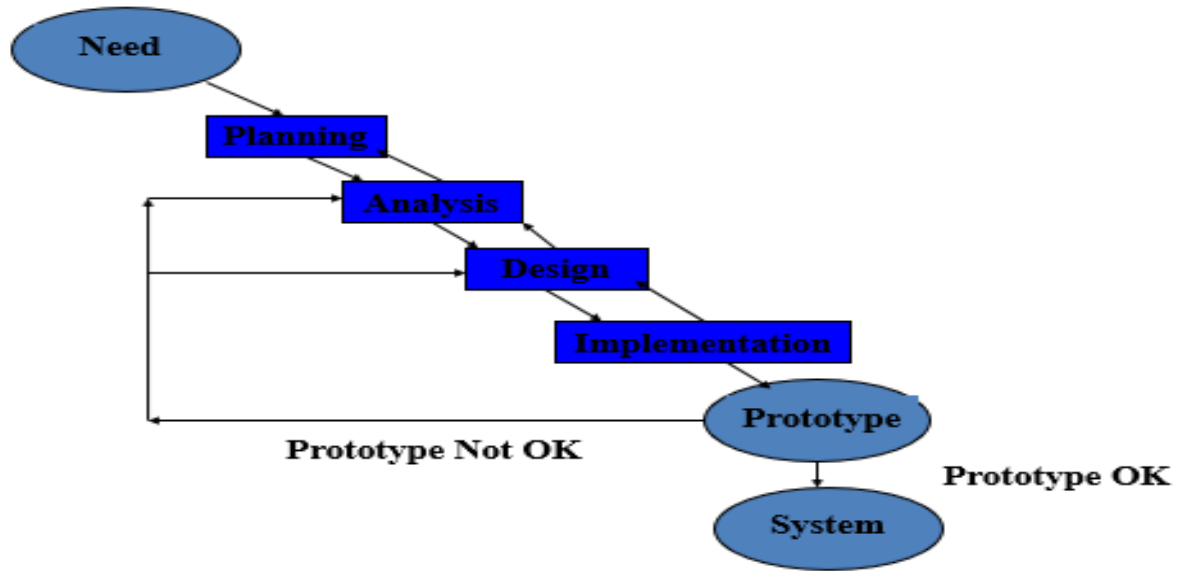
- Respect of Intellectual Property in that all contribution to, and quotation in, from the work of other people's work was attributed, cited and referenced.
- Confidentiality was also an important aspect of ethics to consider while carrying out the study since a lot of classified information was received from both students and the staff.
- Legality was also considered whereby all rule and regulations that the University set up were followed when carrying out the Research.

### **3.8 System Methodology and Design**

A methodology can be defined as a sequence of activities that is systematically required to achieve the objectives of a project. It describes the sequence of activities necessary to solve a problem (Charles Okot Odongo, 2016). In this chapter, the methodology selected was described along with the description of each phase in details. The approach in accordance with the objectives and scope of the project were essential so that development of the project could be implemented or carried out smoothly and systematically.

#### **3.8.1 Dev. Approach / Methodology**

This methodology has three various methods; SDLC, Prototype Method, RAD & DEV OPS. However in my project research, I basically used the RAD and prototyping method. Prototype methodology is a methodology that allows users to interact directly with the system as a step in testing the system. However, a prototype is not a fully completed system but only has some of operative functions which involve interaction with users of the system. Through this methodology, users can identify their requirements of the systems to be developed and to examine whether the system meets their needs or not. For the development of this system, the chosen methodology was System Development Life Cycle (SDLC) that uses the Prototype Model. This model is divided into two, which are Evolution Prototype and Disposable Prototype. The Evolution Prototype model was more appropriate to be used than the waterfall model. The main purpose of the model chosen was repetition can be made to meet the needs of users.



*Figure 1: Prototype Model*

### ***3.8.1.1 Planning Phase***

Among the activities involved in this phase was the selection and determination of the title of the project developed, determine the objectives, scope, expected results and statement of the problem. The problems faced in the current system were identified through observation and early study in the selected organization rather University. Interviews were also conducted with some of the staff at Busitema University, Faculty of science and education. From interviews and observations, hence the objectives and scope of the project were identified. All the activities involved in the project development process is structured and designed in accordance with the scheduling and planning made through a Gantt chart. Project scheduling was done so that time is estimated for a smooth process.

### ***3.8.1.2 Analysis Phase***

In this phase, there were several factors that need to be analyzed such as all information or data gathered. The literature was also analyzed to compare the existing system with similar systems. In addition, tools like excel were used to analyze the data collected by using graphs charts and tables.

### ***3.8.1.3 Design Phase***

During the design phase, the activity involved included process in which the design of the system was made. The purpose of this phase was to translate the functions in the requirement specification to software components, which then produces a system that meets the quality requirements in the most effective approach. The interface and database design are available to describe entities, attributes and relationships between entities of the system.

### ***3.8.1.4 Implementation and Testing Phase***

All software, hardware and application program were utilized to convert or translate the design sketched in the form of program code by using the hardware and software requirements that had been clarified. Then, the final process is testing the proposed system where a user must test to ensure the system is free of error and can function according to user requirements. In addition, System Validation was done and this process involved checking the implemented system whether it confirms inputs to what has been specified. Validation tests such as data and security were carried out to ensure that the system can validate data input from the users rejects any data which is supplied in wrong format and prevent unauthorized users from accessing the system resources.

## **3.9 Implementation Tools**

I used RAD and prototype methods of development because the system was developed in modules and reviews were made per module with respective stake holders hence favors modular development. MySQL is the database that I used, the core IDE for development was VScode, server side scripting language was PHP 7.2 and client scripting was JQuery 3. The system can be accessed via web browser by the secure URI.

## **CHAPTER FOUR: ANALYSIS AND DESIGN**

### **4.0 Introduction**

This chapter produces an outline of the real system and involves defining the system architecture to show how the system works. The design of the system was made after all the information collected was compiled and studied. Two types of designs which are; database design and interface design are shown in this chapter. The Database design shows the type of data stored in the system database. While the interface design also serves to indicate the inclusion of data input and display output to the user. In the analysis, system design, Data Flow Diagram (DFD) and Entity Relationship Diagram (ERD) are used to describe the flow and storage of data for the system.

### **4.1 Analysis of the Existing System**

Currently, Busitema University operates a manual based system, where students go and see the information posted on the notice board or communication is communicated verbally or even physical reach out of the students. The students give feedback to the staff on the information that has been posted on the notice board. Basing on their feedbacks, the staff replies accordingly. The results are then written down on a report and interpreted to the students by the skilled staff.

#### **4.1.1 Problems of the Existing System**

From the overview of the existing system, the following problems were identified;

High costs of data collection: The system requires hiring field workers to reach out to the students for feedback.

Time consuming: There is more time spent in the process of data collection for example training field workers and making sure the information reaches all the students.

The system is prone to error for example during the process of inputting results from the students.

The data collected is unreliable. This is because many students are approached at inappropriate and inconvenient periods for example after an examination. It is burdensome to store large volumes of records used for collecting data.

### **4.1.2 Strength of the Current System**

The strengths of the current system are; it is entirely manual and it can still work in the absence of electricity or internet connection. It is also less costly since it does not require buying of software packages and installing them.

## **4.2 System Requirements of the New System**

The requirements of the new system were classified into two categories which were; the functional requirements which is what the system should do, in other words the main function of the system and the Non-functional requirements which are the requirements that facilitate the system to carry out its main operations.

### **4.2.1 Functional Requirements**

- Carry out communication: The System helps the staff to communicate or post information in the notice board on the online feedback system after they login/ signup. This is aided by the post message form in the system.
- View posted information and comments: The system enables users to view their comments or feedbacks instantly after they have posted information or data in the system.
- View feedback History: The System users are able to view all their entire feedback history they carried out in the past.
- Download feedback History Note: The System is able to download the feedback history that is retrieved after the user prompts it to do so. It saves a file in form of a PDF document and this is the file can be used for further reference or discussions in meetings.

### **4.2.2 Non-Functional Requirements**

1. Usability. The system is very easy to use for both new users and old users since a user manual has been provided to guide the user.
2. Availability. The system is readily available for the users at their places of convenience even at the university because it was installed on some of the computers there and on some phones. In addition, a copy of open source software is available online for remote users to download and use.
3. Reliability. The system is able to recover and be operational again in a scenario where there is a system failure.

4. Security. The system is very secure because it prompts users to authenticate themselves before using it.

### 4.3 Software Requirements

S/N	ITEM	PARTICULARS
1	Operating system	Windows 10 OS
2	Language	C#
3	PDF Reader	Adobe Acrobat Reader
4	Database server	SQL Server Management Studio Express
Other requirements that I used: PHP & MYSQL for scripting and database, Bootstrap CSS framework for styling, IDE used in US code, jQuery 3, html for the structure.		

*Table 3: Showing Software Requirements*

## 4.4 Hardware Requirements

S/N	ITEM	PARTICULARS
1.	Hard disk	500 GB
2	RAM	4GB
3	Personal Computer	Dell
4	Flash disk	16 GB

*Table 4: Showing hardware Requirements*

## 4.5 System Design

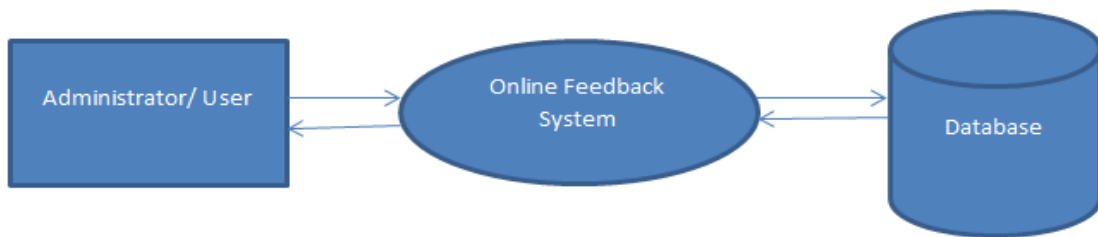
This is the overall arrangement of system and database designs which includes architecture diagrams, case diagrams, entity relationship diagrams and database design tables.

### 4.5.1 Architecture

The Structural Design of the proposed system was carried out using the data flow diagram and use of case diagrams.

#### 4.5.1.1 Context Diagram

There are two types of entities involved in the system which are the staff and the student. A staff needs to post information or data on the platform and the students have to view the information and then post their comments or feedbacks on the same platform, the staff then can view the students feedbacks.



*Figure 2: Context Diagram*

#### 4.5.1.2 Entity Relationship Diagram (ERD)

These are modelling tool that were used to organize data into various entities and define the relationships between the entities. These helped the designer to come up with better database table/structures where the data was stored and retrieved efficiently. They also helped to determine the relationships between the associative attributes and entities within the system.

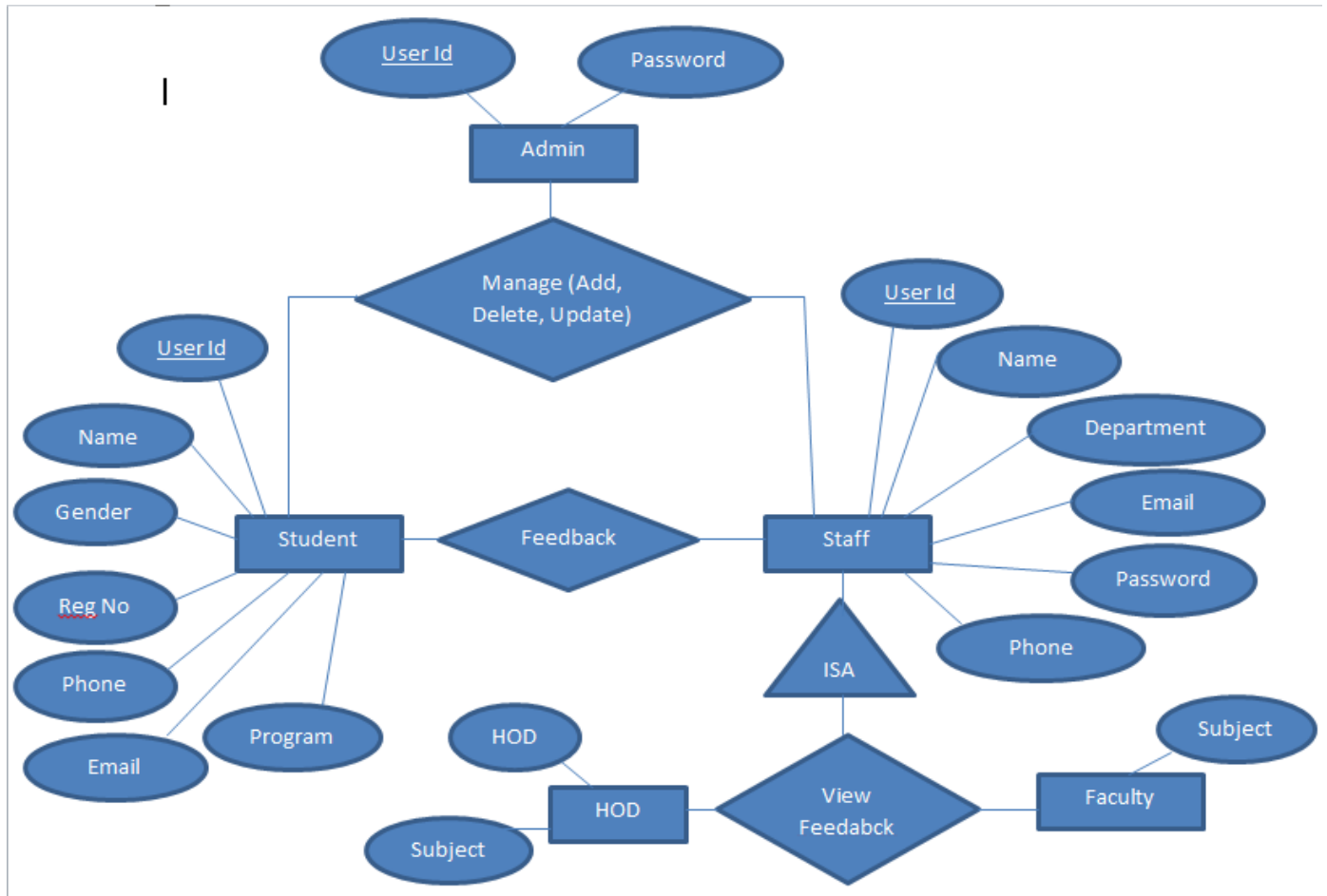


Figure 3: Entity Relationship Diagram (ERD)

#### 4.5.1.3 Flow Chart

To use this system, students and staff need to log in first. Then, the students will give feedback on the information posted by the staff. After that the students can get their results, and view feedback history.



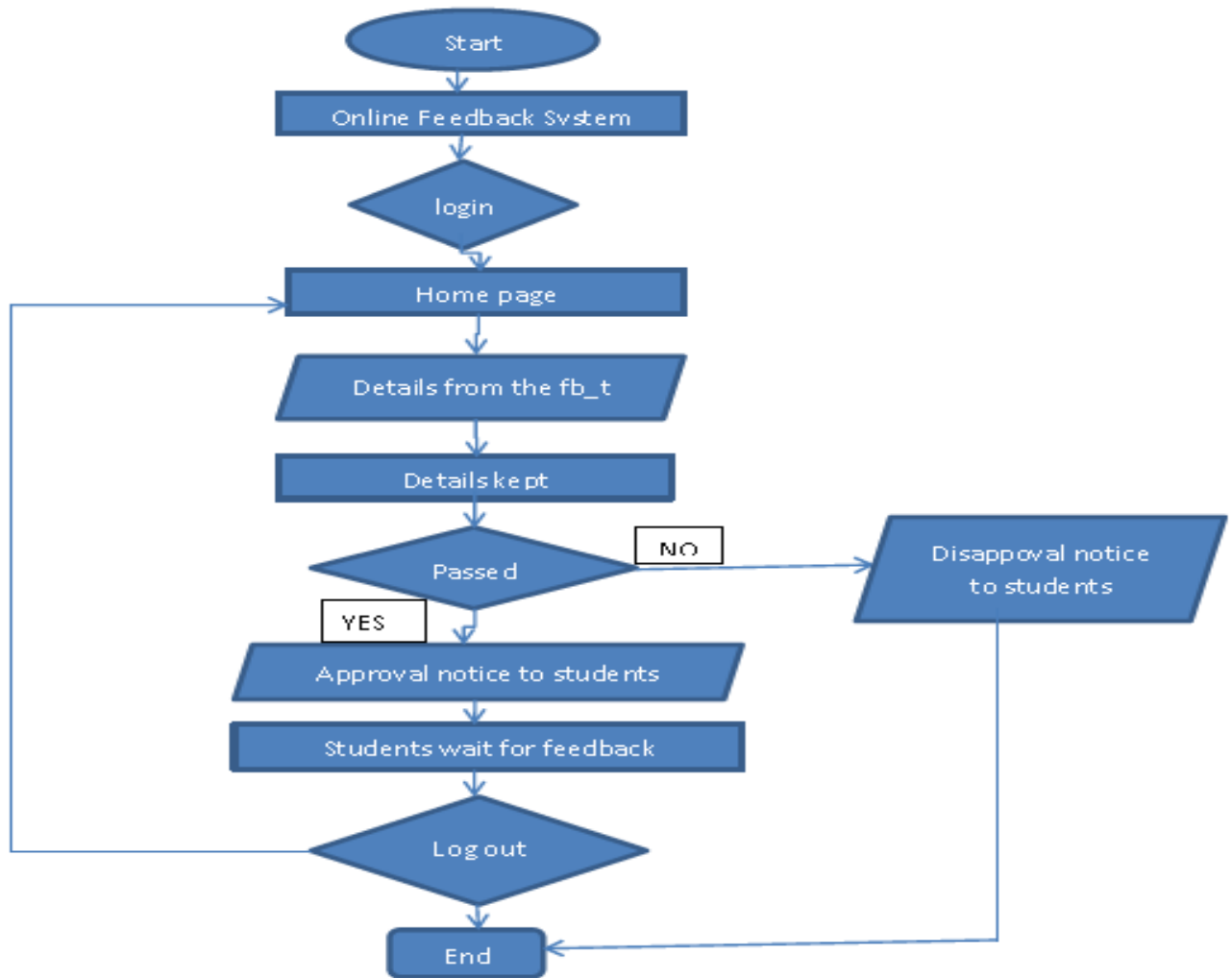


Figure 4: Flow Chart

#### 4.5.1.4 User case diagram

Use case diagrams for each entity present in the proposed system are shown here in details. These include the use case diagrams for the administrator who can be the staff and the students. The use case for the administrator is shown in the figure below. It shows the activities that are performed by the administrator in the system which include login, post message, view comments, view notice board and log out.

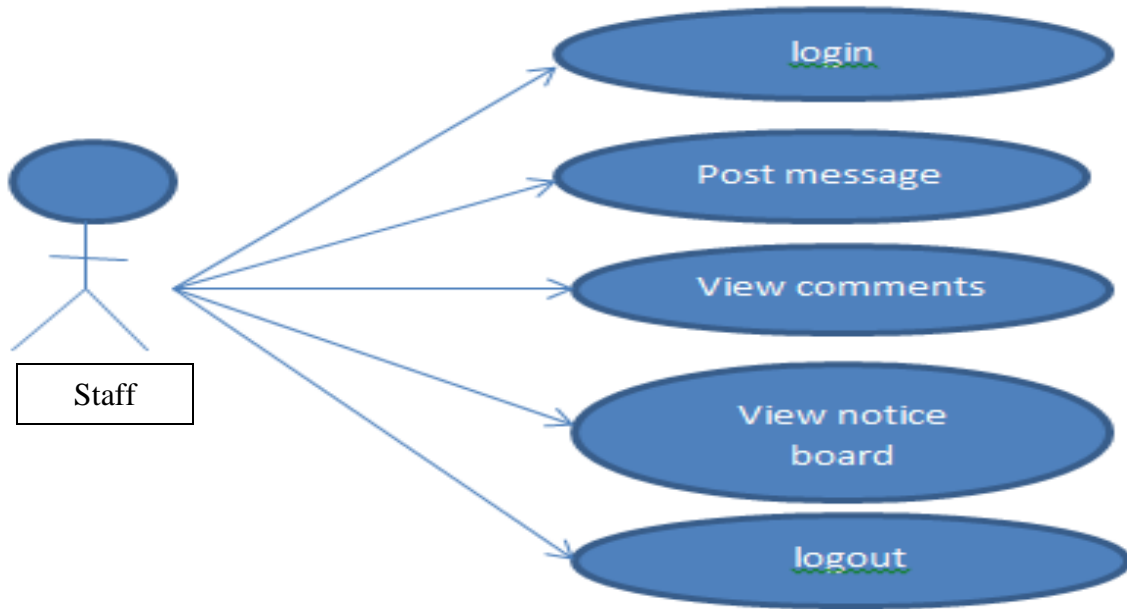


Figure 5: User case diagram for staff

The use case for the student is shown in the figure below. It shows the activities that are performed by the student in the system which include login, view posted message, add comments, edit his/ her comment, delete his /her comment, view notice board and log out.

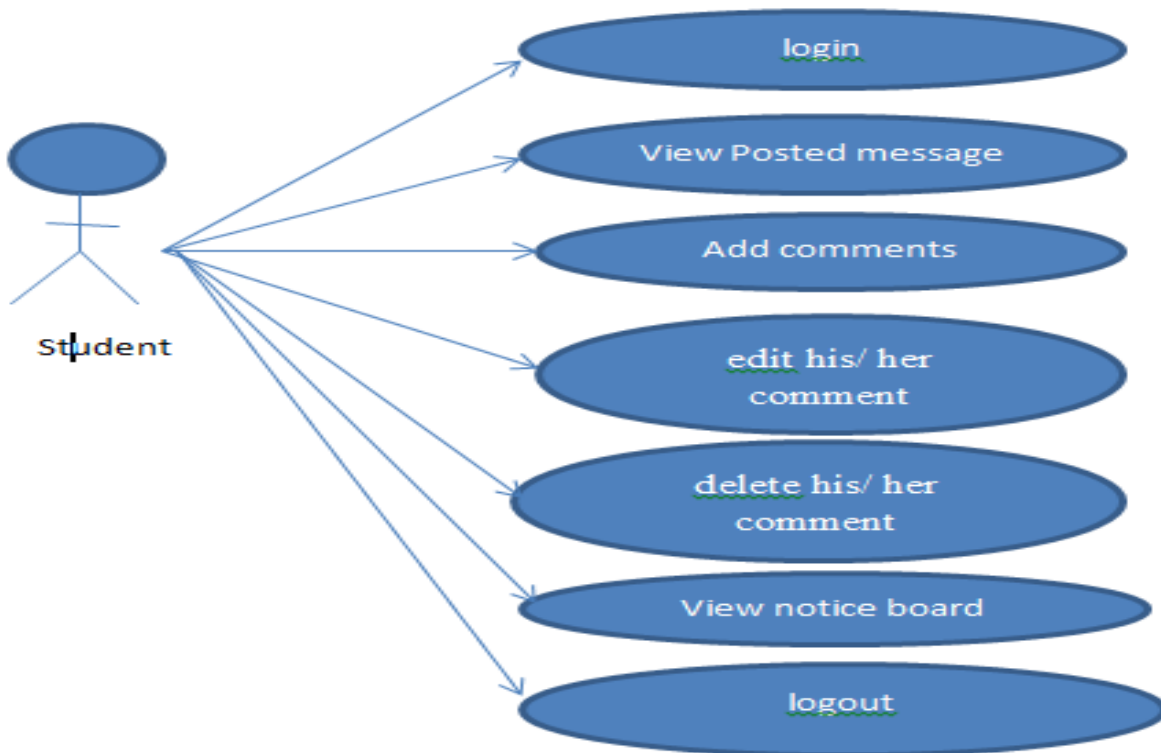
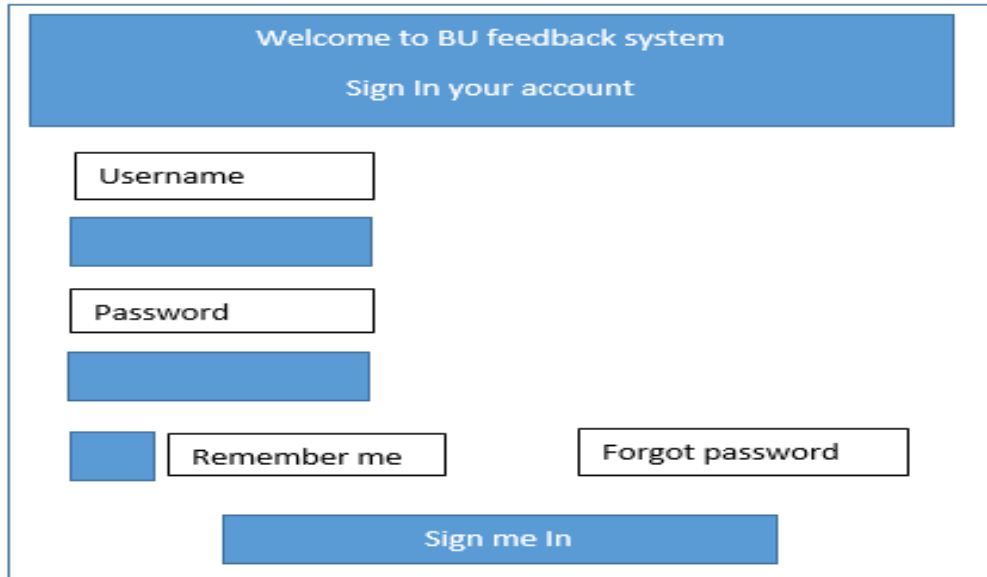


Figure 6: User case diagram for student

## 4.6 User interface designs

A good user interface is a very important part of the system. A good and user-friendly interface attracts the user towards the system. However, a bad User Interface gives a bad experience to the user and thus the user might never return to the system.

### ✚ Login design



The login interface features a blue header with the text "Welcome to BU feedback system" and "Sign In your account". Below the header are two input fields for "Username" and "Password", each with a blue placeholder bar. To the right of the password field are two buttons: "Remember me" and "Forgot password". At the bottom center is a large blue "Sign me In" button.

Figure 7: Login user interface design

### ✚ Home page design

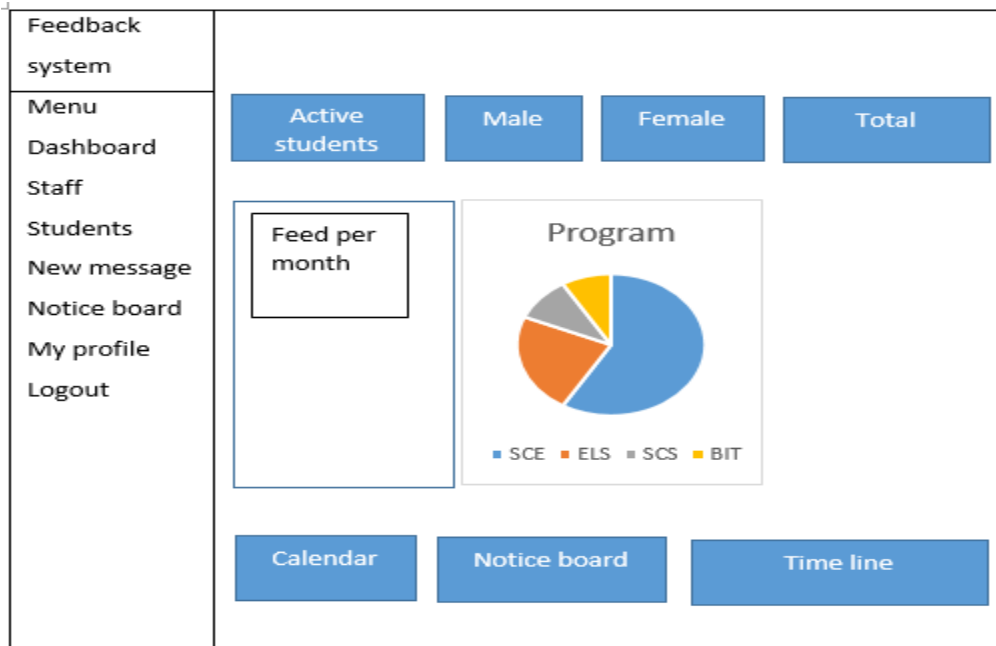


Figure 8: Home page design

#### ✚ Feedback page design

The image shows a web form for submitting feedback. It contains the following elements from top to bottom: a 'Manage Category' button, a 'Choose category' dropdown menu, a 'Title' text input field, a blue horizontal bar, a 'Message' text area, another blue horizontal bar, an 'Attach file pdf' button next to a file upload area, and a large blue 'Submit feedback' button at the bottom.

Figure 9: Feedback page design



#### ✚ Feedback history page design

#Ref	Date	Title	Message	File	Posted by	Options

Figure 10: Feedback history page design

### 4.7 Database Modeling and design

The database for the Online Feedback System was designed in XAMP Apache Server using MYSQLi database. The following diagram explains the relationship of the data entities in the database.

Symbol	Name	Description
	entity	An entity can be any object, place, person or anything.
	attribute	


		An Attribute Describes a Property or characteristics of an entity.
	relationship	A Relationship Describes relation between entities.

Table 5: Database Modeling and design

However, the database design included the following tables; Staff table, User table. Feedback table, Admin table

- **Student table**

1 > >> | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

Options	id	studentID	name	gender	reg	yr	session	phone	email	facultyID	programID
<input type="checkbox"/> Edit Copy Delete	1	1900401449	AANYU IRENE MARTHA	F	BU/UP/2019/1449	2019	DAY	+256787588490	aanyuirenemartha@gmail.com	FSE	DEG
<input type="checkbox"/> Edit Copy Delete	2	1900403269	ADONGO MARTHA AKELLO	F	BU/UP/2019/3269	2019	DAY	+256754690514	obothlawrence92@gmail.com	FSE	DEG
<input type="checkbox"/> Edit Copy Delete	3	1900401451	AGUTI IMMACULATE	F	BU/UP/2019/1451	2019	DAY	+256778238552	agutiimmaculate85@gmail.com	FSE	DEG
<input type="checkbox"/> Edit Copy Delete	4	1900403195	AIGO DINAH	F	BU/UP/2019/3195	2019	DAY	+256773962246	aigod492@gmail.com	FSE	DEG
<input type="checkbox"/> Edit Copy Delete	5	1900401447	AJAMBO SUSAN	F	BU/UP/2019/1447	2019	DAY	+256783376604	ajambosusan2000@gmail.com	FSE	DEG
<input type="checkbox"/> Edit Copy Delete	6	1900401410	AJUKO MARY IMMACULATE	F	BU/UP/2019/1410	2019	DAY	+256770955975	ajukomaryimmaculate@gmail.com	FSE	DEG
<input type="checkbox"/> Edit Copy Delete	7	1900401454	AMODING HELLEN	F	BU/UP/2019/1454	2019	DAY	+256783480182	hellenamoding1@gmail.com	FSE	DEG
<input type="checkbox"/> Edit Copy Delete	8	1900401448	AMPURIRA ANNITAH	F	BU/UP/2019/1448	2019	DAY	+256772693362	ampuriraannitah@gmail.com	FSE	DEG
<input type="checkbox"/> Edit Copy Delete	9	1900401425	AMWENI MARGRET JENIFER	F	BU/UP/2019/1425	2019	DAY	+256776701493	echakarapatrik3@gmail.com	FSE	DEG
<input type="checkbox"/> Edit Copy Delete	10	1900403268	ANYANGO JOANITAH	F	BU/UP/2019/3268	2019	DAY	+256777104689	anyangojoanitah@gmail.com	FSE	DEG
<input type="checkbox"/> Edit Copy Delete	11	1900403194	APIO ESTHER	F	BU/UP/2019/3194	2019	DAY	+256774838174	apioesther45@gmail.com	FSE	DEG
<input type="checkbox"/> Edit Copy Delete	12	1900401430	ATHIENO DAPHINE	F	BU/UP/2019/1430	2019	DAY	+256778127909	athienedanbinesamuk@gmail.com	FSE	DEG

Figure 11: Student table

- **Post table**

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

Options	postID	cat	postType	postTitle	postMessage	postBy	postDate
<input type="checkbox"/> Edit Copy Delete	1	Guild Affairs	Enquiry	Elections	Want to know when the elections will be held	1800402673	2022-01-29 20:11:41
<input type="checkbox"/> Edit Copy Delete	2	Academics	Enquiry	Results	when do we expect to see our results for las semes...	1800402673	2022-01-29 20:13:06

Check all | With selected: Edit Copy Delete Export

Figure 12: Post table

- **Feedback table**

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

+ Options

	fid	uid	cat	title	message	file	date
<input type="checkbox"/> Edit Copy Delete	9	8	Academics	exam timetable	here is the examination timetable	ANENA CAROLINE 2D TRANSFORMATION.pptx	2022-02-07 07:14:33
<input type="checkbox"/> Edit Copy Delete	10	8	Academics	missing results	if any students has complaints about missing resu...		2022-02-07 07:16:00
<input type="checkbox"/> Edit Copy Delete	11	3	Academics	results	expect your results soon		2022-02-07 08:01:49
<input type="checkbox"/> Edit Copy Delete	12	8	Academics	exam timetable	here is the exam time table	Director roles.docx	2022-02-07 08:03:03
<input type="checkbox"/> Edit Copy Delete	13	3	Library Services	past papers	check out past papers of last year	Rct BU sam owori Budget-1.docx	2022-02-07 13:20:47

Check all | With selected: Edit Copy Delete Export

Figure 13: Feedback table

## 4.8 Data Dictionary

Below is the use data dictionary for the online feedback system.

### mails

Column	Type	Null	Default	Links to	Comments	MIME
id	bigint(20)	No				
u_id	smallint(6)	No				
u_role	varchar(5)	No				
sender	varchar(150)	No				
rec_filters	varchar(150)	No				
rec_count	bigint(20)	No				
subject	varchar(150)	No				
message	mediumtext	No				
status	tinyint(1)	No				
date	int(11)	No				

### period

Column	Type	Null	Default	Links to	Comments	MIME
periodID	int(11)	No				
periodYear	smallint(4)	No				
periodSemester	tinyint(1)	No				
periodName	varchar(15)	No				
status	tinyint(1)	No				

### post

Column	Type	Null	Default	Links to	Comments	MIME
postID (Primary)	int(11)	No				
cat	varchar(45)	No				
postType	varchar(45)	No				
postTitle	varchar(60)	No				
postMessage	text	No				
postBy	bigint(15)	No				
postDate	timestamp	No	CURRENT_TIMESTAMP			

Figure 14: Data Dictionary 1

---

**feed\_back**

Column	Type	Null	Default	Links to	Comments	MIME
id ( <i>Primary</i> )	int(11)	No				
fid	int(11)	No				
uid	int(11)	No				
message	text	No				
date	timestamp	Yes	CURRENT_TIMESTAMP			

**Indexes**

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	id	0	A	No	
fid	BTREE	No	No	fid	0	A	No	
uid	BTREE	No	No	uid	0	A	No	

**intake**

Column	Type	Null	Default	Links to	Comments	MIME
id	int(11)	No				
intake	varchar(45)	No				
prefix	varchar(5)	No				
active	int(1)	No				

**mailer**

Column	Type	Null	Default	Links to	Comments	MIME
id	smallint(6)	No				
name	varchar(150)	No				
email	varchar(150)	No				
password	varchar(255)	No				
host	varchar(150)	No				
encryption	varchar(5)	No				
port	smallint(5)	No	0			
role	varchar(5)	No				

*Figure 15: Data Dictionary 2*

---

**program**

Column	Type	Null	Default	Links to	Comments	MIME
id	int(11)	No				
programID	varchar(5)	No				
programName	varchar(45)	No				

**role**

Column	Type	Null	Default	Links to	Comments	MIME
roleID	int(11)	No				
roleName	varchar(100)	No				

**role\_groups**

Column	Type	Null	Default	Links to	Comments	MIME
id	smallint(6)	No				
role	varchar(5)	No				
pageAccess	varchar(100)	No				
roleAccess	varchar(255)	No				

**student**

Column	Type	Null	Default	Links to	Comments	MIME
id ( <i>Primary</i> )	bigint(22)	No				
studentID	bigint(15)	No	0			
name	varchar(25)	No				
gender	varchar(1)	No				
reg	varchar(25)	No				
yr	int(4)	No	1			
session	varchar(45)	No				
phone	varchar(30)	No				
email	varchar(60)	No				
facultyID	varchar(5)	No				
programID	varchar(5)	No				
courseID	varchar(5)	No				

*Figure 16: Data Dictionary 3*

#### 4.9 Description of the database attributes

Below is the description of the database attributes.

- **Log in Table**

S/N	DATA	DATA TYPE	PRIMARY KEY	ALLOWS NULLS
1.	firstname	varchar	False	False
2	lastname	varchar	False	False
3	username	varchar	True	False
4	addressphysical	varchar	False	True
5	email	varchar	False	True
6	password	varchar	False	False
7	phonenummer	varchar	False	False
8	Gender	varchar	False	False
9	dob	datetime	False	False
10	s/n	bigint	False	False
11	profilepic	varchar	False	False

*Table 6: Log in Table*

- **Feedback Table**

S/N	DATA	DATA TYPE	PRIMARY KEY	ALLOWS NULLS
1.	username	varchar	False	False
2	age	bigint	False	True
3	village	varchar	False	True
4	gender	varchar	False	True
5	weight	varchar	False	True
6	symptomlength	bigint	False	False
7	diagnosisdate	datetime	False	False
8	fever	bigint	False	True
9	stomachpain	bigint	False	True
10	chills	bigint	False	True



11	vomiting	bigint	False	True
12	sweating	bigint	False	True
13	nausea	bigint	False	True
14	musclepain	bigint	False	True
15	anaemia	bigint	False	True
16	headache	bigint	False	True
17	diarrhoea	bigint	False	True
18	bloodgroup	varchar	False	True
19	s/n	bigint	True	False
20	weakkness	bigint	False	True
21	fatigue	bigint	False	True
22	testresults	varchar	False	True
23	discriptionofdiagonosis	varchar	False	True

*Table 7: Feedback Table*

## **CHAPTER FIVE: IMPLEMENTATION AND TESTING**

### **5.0 Introduction**

This Chapter shows whether the plans made in the previous phases are achieved or not. This Chapter also tests the functionality of the system to ensure that the system is built to meet the needs and demands of users. For the testing phase, there were two types of tests that were implemented, namely; functional testing and user acceptance testing. Testing phase is important because, when in this phase, the system builder gets to know the strengths and weaknesses in the system that has been developed.

### **5.1 Implementation**

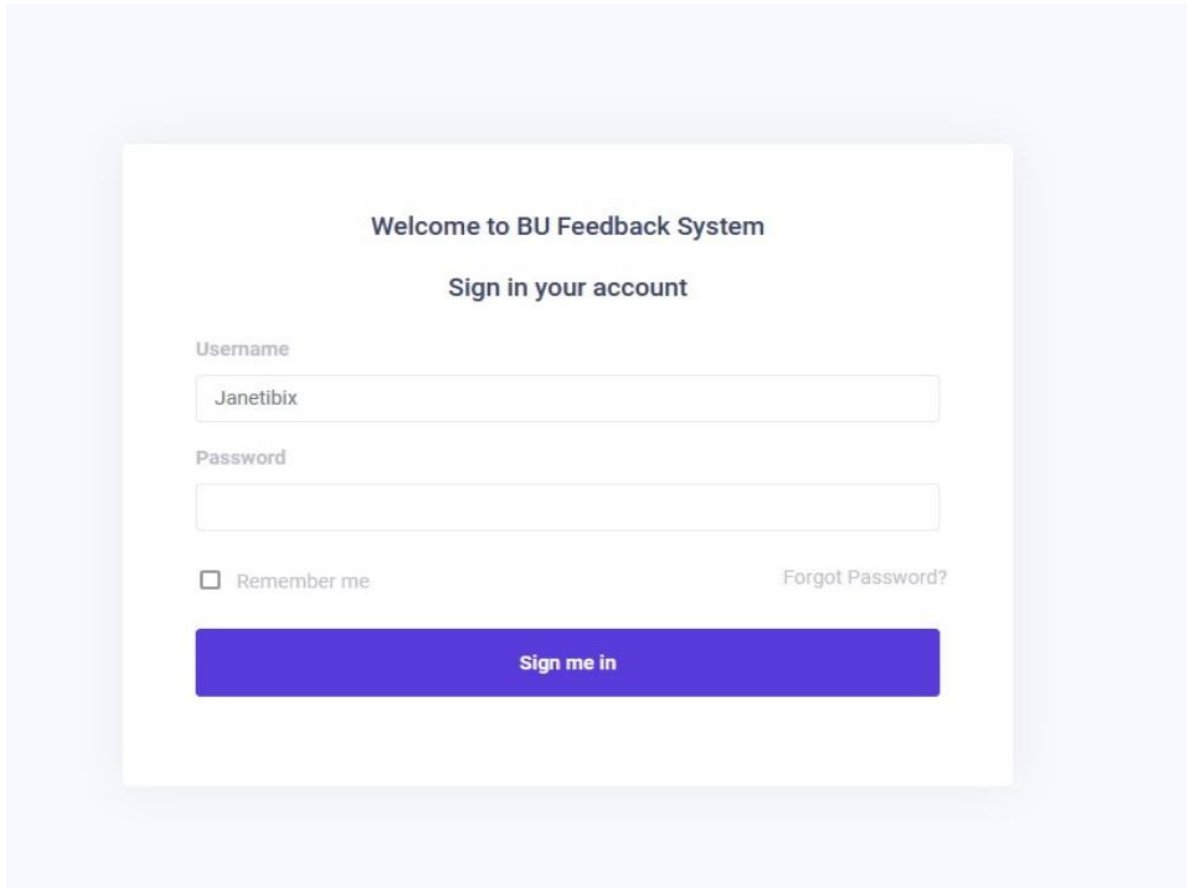
Coding in the implementation is to write the codes of a program that will make the system run so that they can be tested and used by students and staff. The developed system is a stand-alone system and the programming language used was PHP, MySQL, jQuery, Bootstrap.

#### **5.1.1 User Interface of the online feedback system**

A good user interface is a very important part of the system. A good and user-friendly interface attracts the user towards the system. However, a bad User Interface gives a bad experience to the user and thus the user might never return to the system.

##### **Login Page**

This is the default page of the system. It contains the login section for the students and staff to provide their credentials to authenticate them to gain access to the system.



The image shows a login page for the BU Feedback System. The page has a white background with a light blue border. At the top, it says "Welcome to BU Feedback System" and "Sign in your account". Below this, there are two input fields: "Username" with the value "Janetibix" and "Password" which is empty. There is a checkbox for "Remember me" and a link for "Forgot Password?". At the bottom, there is a blue button labeled "Sign me in".

*Figure 17: Login Page*

### **Home Page**

There are five main functions which are menu home page, profile where users can update and view their profile, Services where the users can communicate and also view their feedback History, then lastly the Sign Out function where users log out of the system.

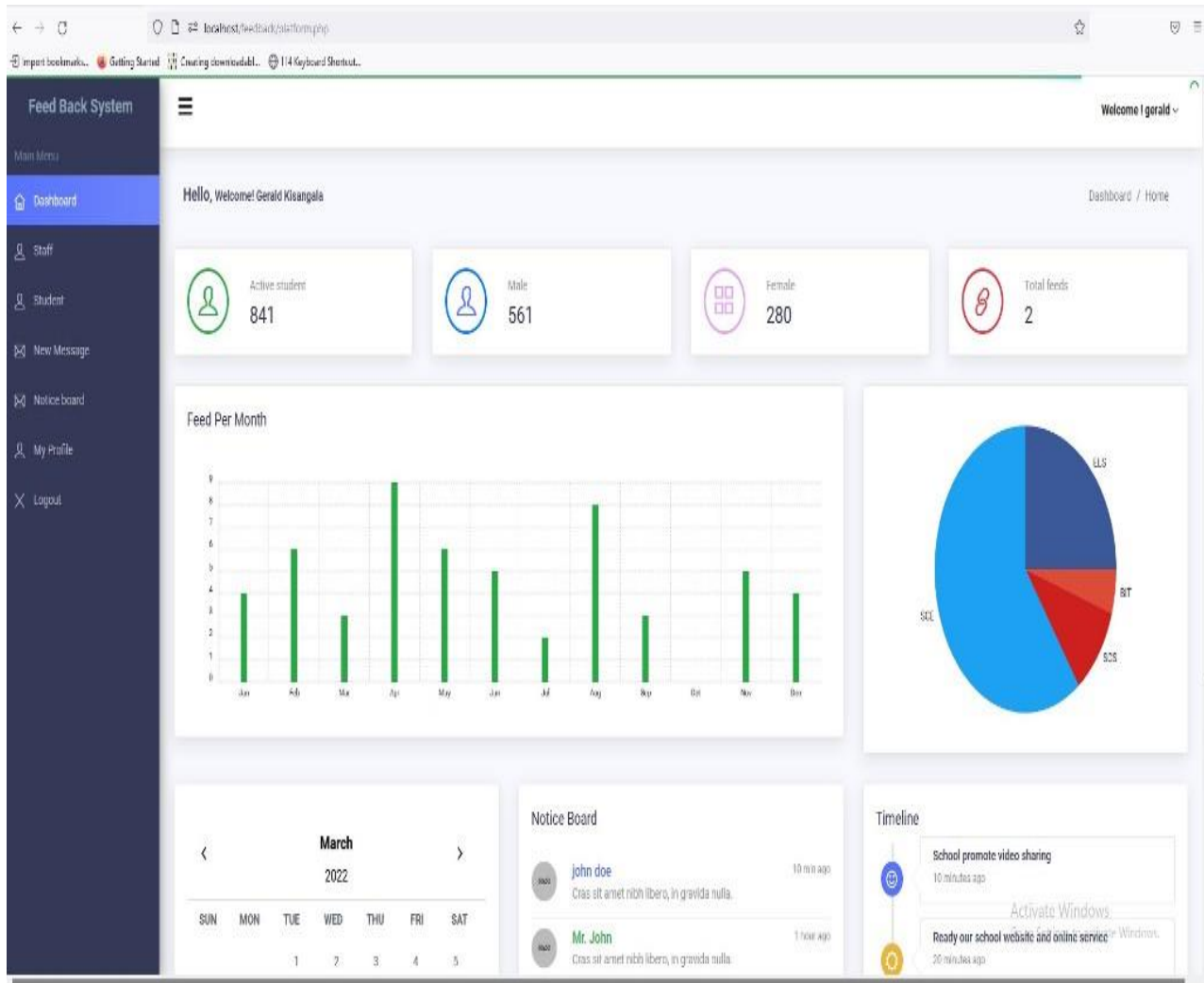


Figure 18: Home Page

### Feedback Page

This is where the system users post a message so that data is captured and stored in the database.

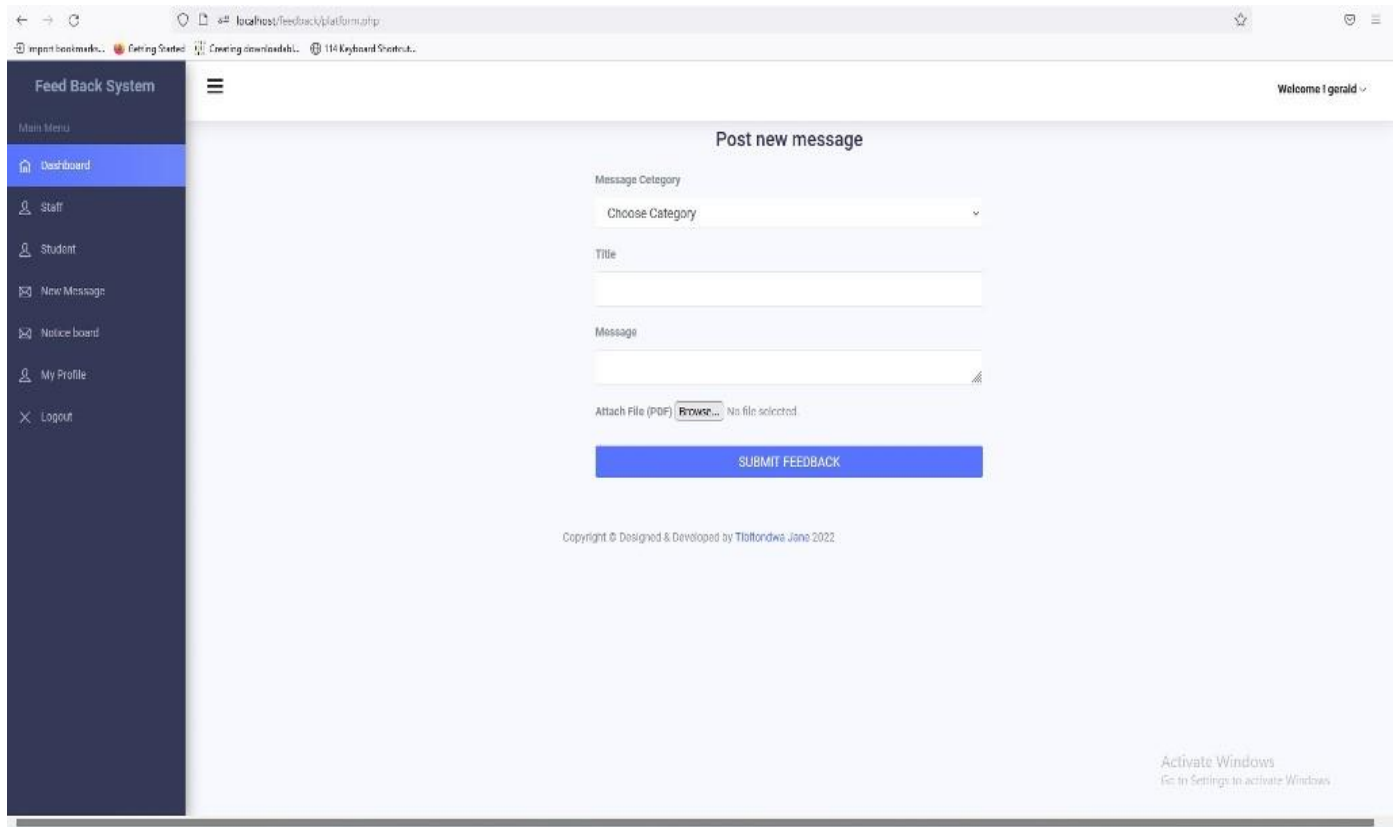


Figure 19: Feedback Page

**Staff details Page**  
 This show the staff details.

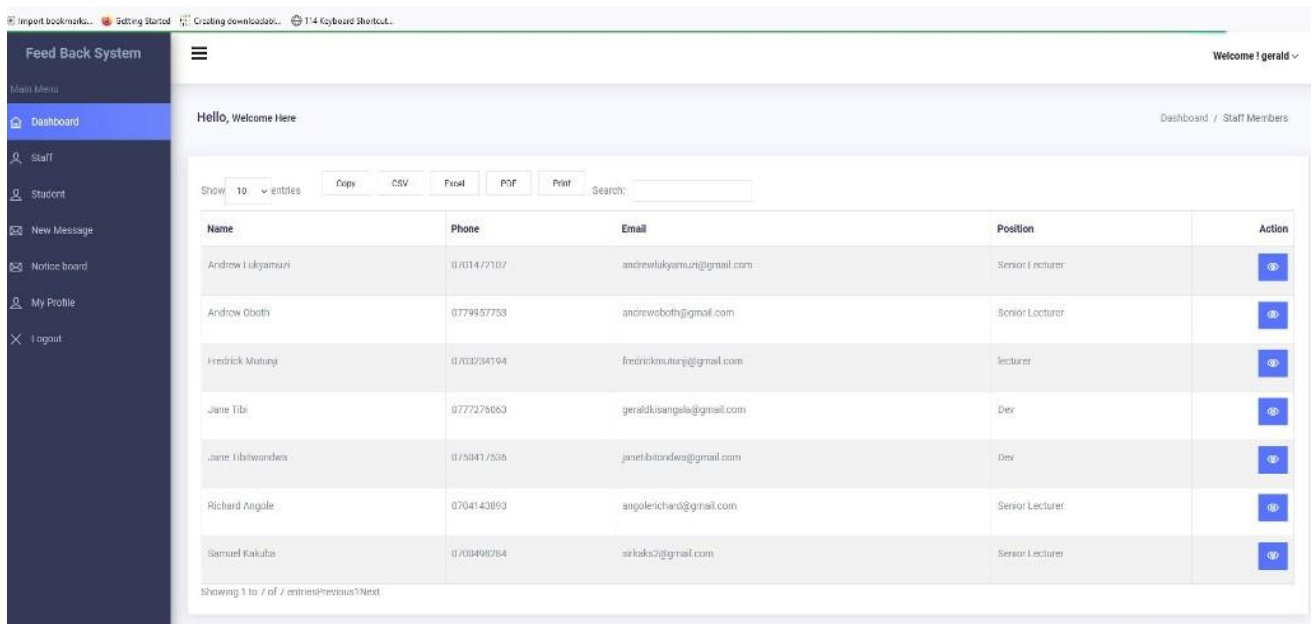
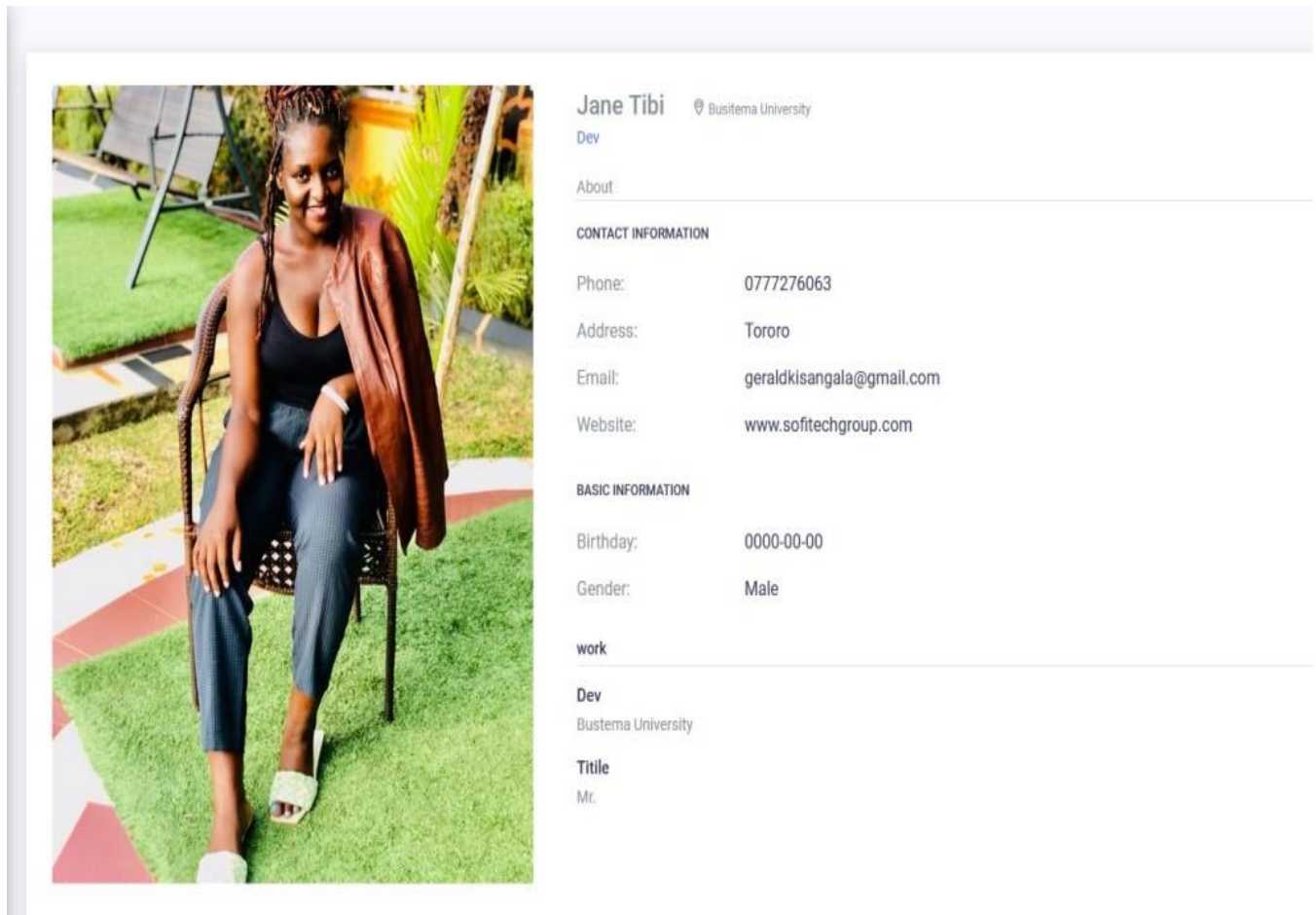


Figure 20: Staff details Page

## Admin details page

This shows the admins profile.



The screenshot displays a user profile for Jane Tibi, a developer at Busitema University. The profile includes a profile picture of Jane Tibi, a woman with braids, wearing a black top and blue pants, sitting on a chair outdoors. To the right of the photo, the profile details are listed:

- Name:** Jane Tibi
- Organization:** Busitema University
- Role:** Dev
- About:** (Section header)
- CONTACT INFORMATION:**
  - Phone:** 0777276063
  - Address:** Tororo
  - Email:** geraldkisangala@gmail.com
  - Website:** www.softtechgroup.com
- BASIC INFORMATION:**
  - Birthday:** 0000-00-00
  - Gender:** Male
- work:** (Section header)
- Dev:** Bustema University
- Title:** Mr.

*Figure 21: Admin details page*

## Download Page

This show the PDF file that has been downloaded and opened in Adobe.

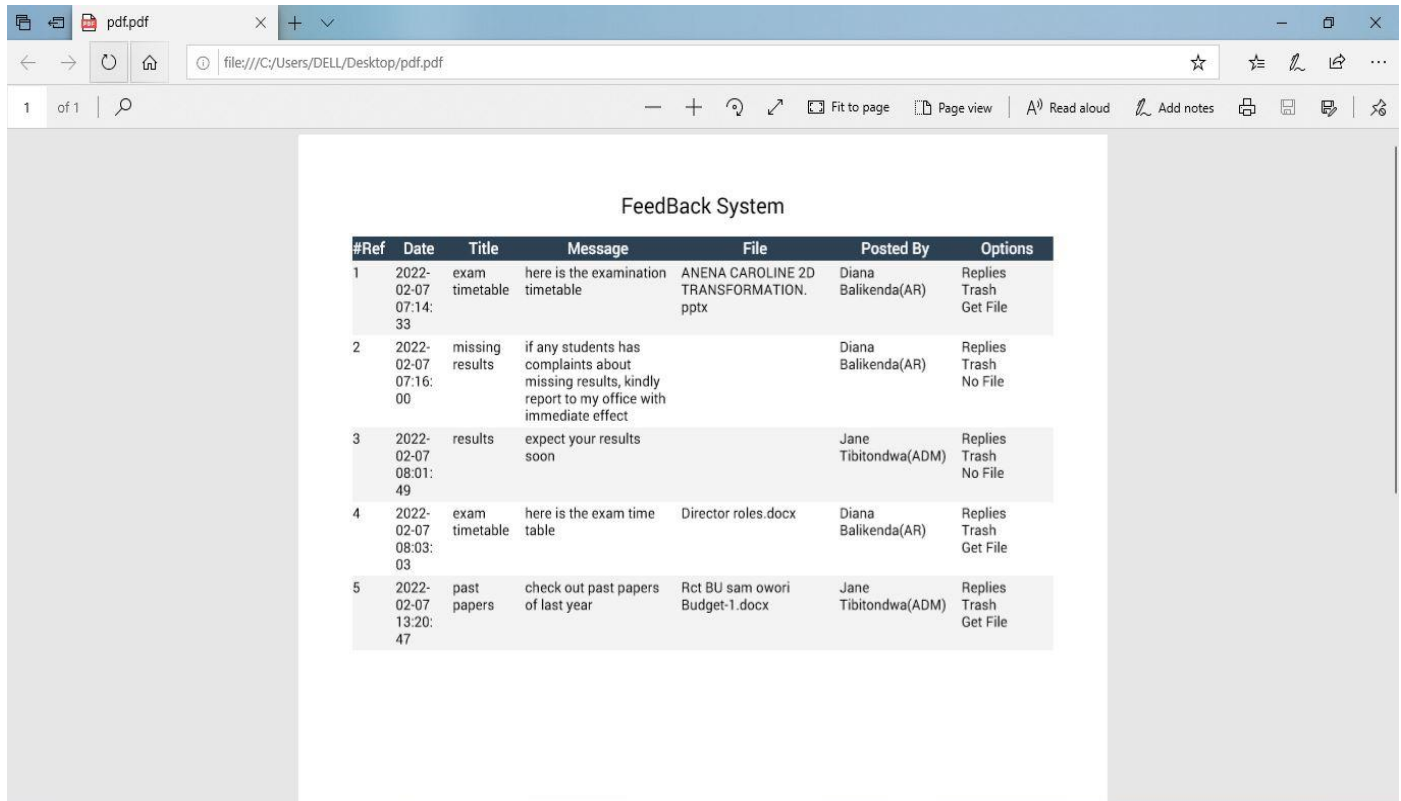


Figure 22: Downloaded Page

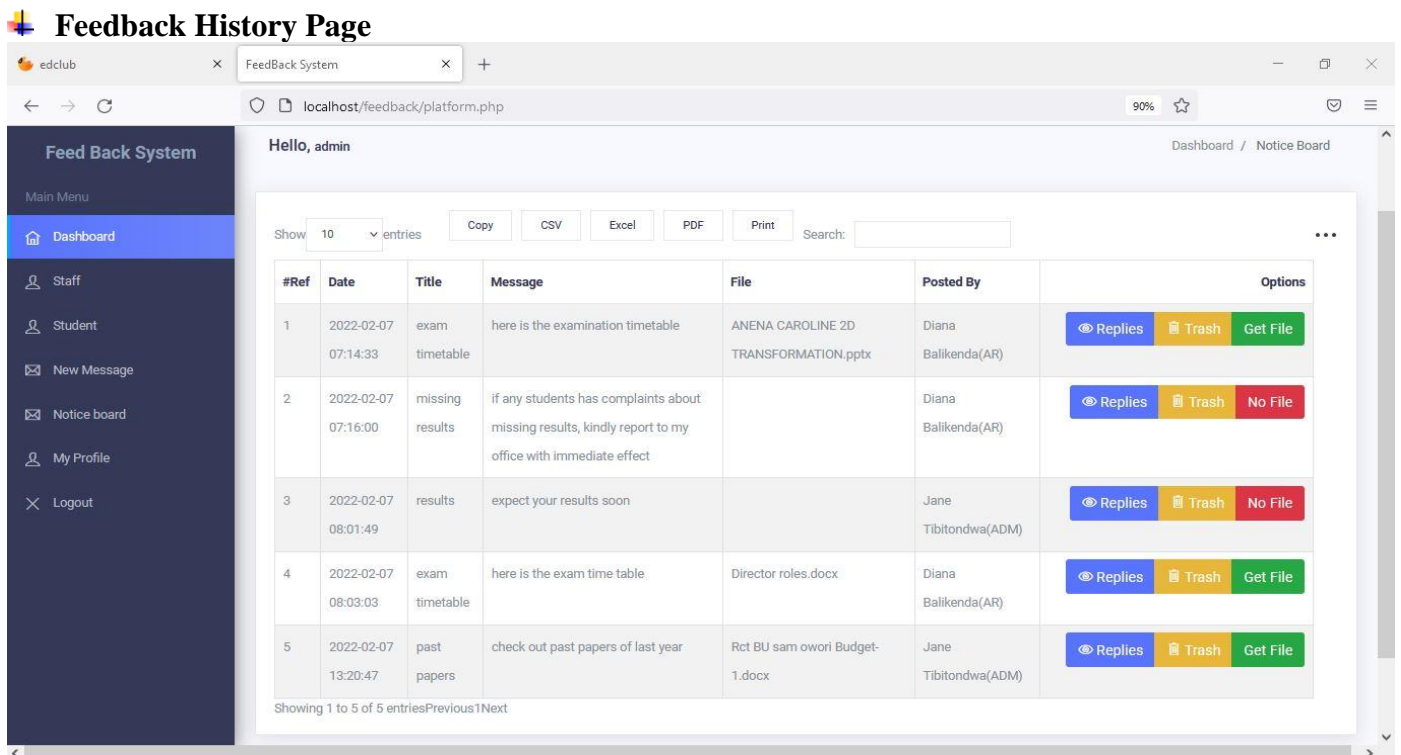


Figure 23: Feedback History Page

## 5.2 Testing

Functionality testing of the system was made to ensure that each module developed functions properly and smoothly as required and that it could achieve the goals and objectives set. Incorrect codes were continuously corrected and purification processes of this code continued to be implemented until the completion of the computerized Feedback system. A summary of the testing system functionality for the Online Feedback system is contained in in the table below.

The system testing was based on the results of the test module and function testing conducted. This test was intended to ensure that the system design meets the requirements of the user criteria. In addition, tests were also carried out directly.

The table below shows some cases of the tests that I carried out;

<b>S/N</b>	<b>TEST CASE</b>	<b>EXPECTED RESULTS</b>	<b>ACTUAL RESULTS</b>
1	Login function	User successfully logged in after entering their correct ID and password	Results as expected
2	Incorrect login details entered	An error message displayed	Results as expected
3	Feedback function	The message is entered into a form	Results as expected
4	View feedback history	The feedback history of a given user was viewed	Results as expected
5	Downloading feedback history	Users were able to download their feedback history in form of a PDF file.	Results as expected

*Table 8: Showing the Functionality test of the system*



## **CHAPTER SIX: INTRODUCTION, CONCLUSION, & RECOMMENDATIONS**

### **6.0 Introduction**

This chapter presents the summary of the findings, conclusions and recommendations based on the data analyzed in the previous chapter. In addition, limitations have been identified and listed. The effectiveness of communication between the staff and the students was researched by determining to what extent some of the objectives of the development of the computerized Feedback System have been attained.

### **6.1 Conclusion**

The application of the online feedback system will save the administration from doing the strenuous work of physically reaching out to students in order to retrieve their views. This will help the administration redirect their energy from data collection to the analysis of the data in order to get meaningful information that can be used in informed decision making.

In addition to this, adoption of this technique will help cut costs incurred in the data collection process, save time during the process and also improve on the credibility of the data collected.

### **6.2 Recommendations**

The administration should solicit funds to be invested in the testing and implementation of the feedback system. The funds should also help in doing a feasibility study in order to confirm the benefits that come with using this system.

The online feedback system should therefore be adopted and used every after a semester to evaluate the course and teaching at the school of Faculty of Science and education.

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