STUDENT-BASED FACULTY EVALUATION AND FEEDBACK APPLICATION

CASE STUDY: BUSITEMA UNIVERSITY-NAGONGERA CAMPUS

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DECLARATION

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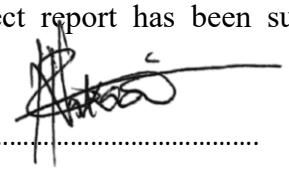
DATE: 3rd/01/2024

APPROVAL

This project report has been submitted for examination with the approval of the following supervisor



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DEDICATION

Firstly, I thank God who has successfully guided me to complete my project without health issues and has been my guide in writing this report.

I dedicate my report to my dear parents, Mr. and Mrs. Kasirye who have supported me in my education, who have never failed to give me moral and financial support. Sincere appreciation to my loving mom Miss Nalubowa Norah who has taught me the purpose of life. Thank you so much for all your support and may the good Lord bless you.

I would like to extend special thanks to my supervisor Dr. Nakasi Rose who has guided me throughout the course of my final year project and that has turned out to be a success.

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With utmost gratitude, I would like to thank my supervisor Dr. Nakasi Rose for guiding me through my final year project from the start up to the end of writing my project report. No matter all the challenges I faced, she was of great support and help in completing the project.

Furthermore, I would like to thank the students of Busitema University who have helped me in gathering information that I needed for my research which was used in making and completing my final year project.

Lastly, i would like to thank my fellow students whom I have studied with till the end for they have been of great help in testing my final year project and giving feedback about it.

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LIST OF ACRONYMS

SBFFS	**Student-Based Faculty Evaluation and Feedback System**
RAD	**Rapid Application Development**
MVP	**Model View Presenter architecture**
ERD	**Entity Relationship Diagram**
EFFS	**Electronic Faculty Evaluation and Feedback System**
MIS	**Management Information System**
EMIS	**Education Management Information System**

ABSTRACT

The student-based faculty evaluation and feedback application was designed to allow the students to provide evaluations and feedback not only about the teaching effectiveness but also about different departments of the faculty for example sports department, power, water, security facilities in order to ensure that students have a comfortable learning environment. It consisted of two components that is the students and the administrators.

The students' section within the application enabled the students to log into the application view the students' dashboard and be able to select different departments of the faculty in order to provide their ratings and also write any suggestions/comments that they would be having.

The administrator's section within the application enabled the administrator to log into the application view the admin dashboard and be able to add new student in the database so as the student to access the application, edit the student information by either deleting the existing information or even updating it, view comments/suggestions written by the students from the different sections of the faculty and also be able to view the analyzed ratings through the usage of the pie charts.

The methodologies used was Rapid Application Development (RAD) which was easy and helped a lot in delivering a working system in a very short period of time. The Model View Presenter (MVP) architecture was also used in designing the application in order to handle requests and provide data to the user. I further went ahead and used Firebase Realtime cloud database as the database management system for storing all the details of the application. I used android studio as the IDE and code and layout editor to develop the application plus using java programming language as a technology to develop the application. The operating system that was used to install the application on the mobile phones was Android operating system.

Chapter One: Introduction

1.1 Background Of the Study

Most universities and colleges used to conduct student evaluations of faculty performance traditionally using paper-based surveys where the data was collected and then summarized manually(Layne, Decristoforo and McGinty 1999). This caused so many challenges like taking up a lot of time while carrying out the evaluation and feedback process, misplacement or omission of data during the analyzation process.

Today, information has become rapidly accessible because of technological advancements. It is inevitable for the educatory institutions, where the basis of information is formed, to pioneer at the point of presenting information(Chrisman 2002). Computers and electronic communication stand out as important components in terms of making information available(Geymen, Beşdok et al. 2008). Computer environment is employed so as to ensure faster flow of information in the rapidly developing world(Durkaya and Durkaya 2003). Faculty evaluation and feedback systems are part of this trend.

The student-based faculty evaluation and feedback system is a process in which students provide anonymous and constructive feedback on their courses and instructors' teaching methods, content and delivery, allowing educational institutions to identify strengths, areas for improvement, promote a culture of continuous improvement in teaching and learning. The system includes students providing their ratings, opinions and comments or suggestions about different parts of the faculty.

Academic faculty evaluation is a yearly recurring part of the management process at most universities and it is an issue that is getting more and more attention, as universities all over the world are required to become increasingly accountable for their performance and efficiency to their stakeholders. Designing good academic faculty evaluation systems is not a simple problem because multiple issues and a large number of criteria should be considered and aggregate in a sensible way(Collan, Stoklasa and Talasova 2014).

Manual faculty evaluation and feedback system which are paper-based are associated with a lot of problems such as misplacing or omission of the data collected from the students, a long period f time required to analyze the collected and group it.

1.2 Problem Statement

The student-based faculty evaluation and feedback system plays a crucial role in improving teaching quality, enhancing the learning environment and supporting faculty development(Uttl, White and Gonzalez 2017).

At Busitema University-Nagongera Campus and other education institutions, the prevalent reliance on a paper-based faculty evaluation and feedback system poses significant challenges whereby the inefficiencies inherent in manual processes, including cumbersome data retrieval, storage, maintenance, contribute to an overall time-consuming administrative burden. Moreover, the extended time required for data analysis further hinders the institution's ability to derive timely

insights from student feedback. This old-fashioned system not only compromises the efficiency of the administrative tasks but also delays the institution's speed and ease in responding to dynamic educational needs.

Therefore, there was need to develop and implement an online student-based faculty evaluation and feedback application which would digitalize the evaluation and feedback process, as well also ensure the swift data management and analysis to foster a more responsive and efficient educational environment and as well eliminate the usage of paper work.

1.3 Purpose/Objectives of The Study

The main goal of the study was to design and develop a student-based faculty evaluation and feedback system that would automate the process of students providing feedback on various aspects of teaching, learning and the faculty's overall performance to identify areas for improvement and to ensure that the institution meets its educational objectives.

Specific Objectives

1. To determine the requirements for the student-based faculty evaluation and feedback application.
2. To design the student-based faculty evaluation and feedback application.
3. To implement the student-based faculty evaluation and feedback application.
4. To test the student-based faculty evaluation and feedback application.

1.4 Significance of The Study

On successful development and further implementation of the student-based faculty evaluation and feedback application, the study would lead to the following significances;

1. To eliminate the usage of paperwork and be able to speed up the evaluation and feedback process.
2. To allow students and administrators to access the evaluation process from anywhere with an internet connection and participate at their own convenience making the process more efficient and inclusive.
3. To maintain the anonymity of the students during the evaluation process, encouraging more honest and candid feedback.

1.5 Scope of The Study

The student-based faculty evaluation and feedback application was designed for Busitema University-Nagongera Campus which is located in Nagongera Township in Tororo district about 17 kilometers from Tororo town along Tororo-Busolwe road.

The application provided a security module with two levels of access including students and administrators. It enabled the administrators to register students and also edit student information and also monitor evaluation and feedback received from the students. It also enabled students to evaluate and provide feedback about the faculty.

Chapter Two: Literature Review

2.1 Introduction

This chapter comprises of a comprehensive analysis of information on theoretical and practical views of other research projects conducted in universities and colleges for the faculty evaluation and feedback system both manually and electronically. This research study combines factors that other researchers have done that would result in the better faculty evaluation and feedback system at Busitema University-Nagongera Campus.

This chapter is subdivided into different sections for example information systems, management information systems, education information systems, student-based faculty evaluation and feedback system, current faculty evaluation system, challenges of the current faculty evaluation system and the benefits of the automated student-based faculty evaluation and feedback system.

2.2 Information System

Information system is the software and hardware systems that supports data-intensive applications and this system is composed of people and computers that process or interpret information. Any information system aims to support operations, management and decision making(Longdom n.d). information systems allow users to collect, store, organize and distribute data in companies. Many businesses use their information systems to manage resources and improve efficiency.

An information system is composed of the following parts; people who interact with the system, hardware which are the physical devices like servers, routers, software which are programs and applications that process and manage data, data which are raw facts and figures that are processed and turned into useful information and procedures which are rules, guidelines and protocols for operating and maintaining the system. Information systems are of different types namely Transaction Processing system (TPS), Management Information Systems (MIS), Decision Support Systems (DSS), Executive Information Systems (EIS) among others.

2.3 Management Information System (MIS)

MIS provide information in the form of reports and displays to managers and many business professional(O'Brien). MIS is a system that provides the information necessary to manage an organization effectively. MIS should have a clearly defined framework of guidelines policies or practices, standards and procedures for the organization. MIS is basically concerned with processing data into information which is then communicated to the various departments in an organization for appropriate decision-making. MIS provides information to the decision makers in the form of reports, are usually generated through accumulation of transaction processing data. Examples of MIS include the Bank Information System, Railways Information System, Educational Information System among others.

2.4 Educational Information Systems (EMIS)

An EMIS is a system of people, technology, methods, processes, procedures, rules and regulations that function together to provide comprehensive, integrated set of relevant and timely education data to planners, decision makers and managers of education at all levels(Malawi 2009). It is an education database that aims at ensuring timely, accurate and appropriate education data and information are available for decision making. It is a global concept for educational management

that encompasses the application of modern information and communication technology in collection, collation, storage and analysis of education data.

Furthermore, an EMIS is a platform which lets educational institutes to manage their data or information in a single place. This system acts as a data repository where institutions can gather, store, and analyze their data, also create various reports which help them in monitoring the institution growth and students' academic progress in real-time. The EMIS can be used in schools, colleges and universities with or without customization.

The EMIS was established in 1998 by the Ministry of Education and Sports (MoES) in Uganda to improve the planning, management and monitoring of the education system. EMIS was thus conceived to enable MoES headquarters to collect, capture and process data to generate management information that could help in planning and evidence-based decision making at all levels. Consequently, it is expected to maintain management data on key performance Indicators of the sector including data in institutions, teachers, pupils, infrastructure, finances and audit and school inspection(MoES n.d). The EMIS data is also made available to other stakeholders, such as schools, parents and researchers. The EMIS has been instrumental in improving the education sector in Uganda and the data collected has helped the MoES to identify areas where the education system is performing well and areas where it needs improvement. The EMIS data has also helped the MoES to allocate resources more effectively and to develop policies that are more likely to be successful. The EMIS is still under development but it has the potential to make a significant contribution to improving the education sector in Uganda.

EMIS examples include; School-MIS, EMISPro, EMIS2020, EdBase among others. Under the EMIS, several system and tools are built to support different aspects of the education sector based on the key components and features. Some of the systems include; Online Student Registration system, Digital Learning Management System, Admission and Application Tracking System among others. A student-based Faculty Evaluation and Feedback system is among the systems that are built to support the education sector.

2.5 Electronic Faculty Evaluation and Feedback System (EFFS)

An EFFS is a technology-based platform that streamlines the process of collecting, analyzing and disseminating feedback from students to faculty members. Faculty evaluation systems are basically for two purposes; provide feedback for self-improvement where provided information assists the faculty in enhancing current performance or correcting deficiencies in areas, they and the administration consider relevant and important and also provide data for personnel decisions where they must provide decision-makers with relevant, reliable data concerning faculty performance on which to base promotion, tenure, continuation, merit pay or other personnel decisions(Arreola 2004).

The history of the EFFS dates back to the early 1990s where one of the earliest systems to be developed was the CourseEval system at the University of Minnesto in 1991. The system was developed by the University's Office of Measurement Services (OMS) in response to a growing demand for more efficient and effective ways to collect student feedback on teaching and it was designed to be easy to use for both students and instructors. The system was initially used on a

pilot basis in a few departments at the University, but it was quickly adopted by other departments and eventually became the standard system for student evaluations at the University. The CourseEval system has been used by the University of Minnesota for over 30 years, and it has been credited with helping to improve the quality of teaching at the University(Duluth n.d). The CourseEval system was primarily student-focused, aiming to collect feedback from students about their learning experiences, course content, teaching methods, and instructor effectiveness. The system also introduced a level of standardization to the evaluation process as it allowed universities to use consistent questionnaires and evaluation criteria across different courses and departments, making it easier to compare results and identify patterns and trends. The system facilitated data-driven decision-making in faculty evaluation and course improvement where the collected data could be analyzed to identify strengths and weaknesses in teaching, leading to evidence-based decisions for faculty development and curriculum enhancement. The system faced some challenges for example; the technology infrastructure was not as robust and sophisticated as it is today, the system did not provide any data analysis tools, which meant that instructors had to manually analyze the feedback that they received and the system was a new technology, and there was some resistance to use it among the faculty members.

As one of the first EFFS, the CourseEval System likely served as a reference point and a case study for early research on EFFS. The early success of the CourseEval system influenced the development and adoption of other EFFS at other universities and institutions. The Faculty Evaluation System (FES) was released by the National Center for Higher Education Management Systems (NCHEMS) in 1995 in response to the growing demand for more efficient and effective ways to collect student feedback on teaching. It was developed to address the need for a comprehensive and standardized approach to faculty evaluation, include multiple evaluation criteria, such as teaching effectiveness, research productivity, service to the institution and the community and professional development, and also allow institutions to customize the system to align with their specific needs and priorities. The release of the FES was a significant event in history of faculty evaluation as it helped to make faculty evaluation more effective and efficient, and it also helped to make the process more transparent. The FES is still widely used today, and it remains a valuable tool for faculty evaluation(nchems.org n.d). The FES faced some challenges for example; the technology infrastructure was not as robust and sophisticated, the system did not provide any data analysis tools, which meant that instructors had to manually analyze the feedback that they received and ensuring the confidentiality and protection of responses and sensitive data was hard.

During the early 2000s, one of the mostly used EFFS is the Blue Course Evaluation System which was developed in 2010 by Explorance, a company that specializes in developing educational technology. The system was initially released as a tool for faculty evaluation, but it has been since expanded to include a variety of other features, such as allowing institutions to create customizable evaluation questionnaires that cover various aspects of the course, instructor performance and the learning experience, its integration with popular Learning Management Systems (LMS) such as Moodle, Canvas to enable automatic distribution of evaluation surveys to students, offering robust analytics and reporting features where it generates detailed reports and visualizations to help institutions analyze evaluation results(eXplorance. n.d).

In a nutshell, the EFFS that have been developed have reduced on the use of paper work and have as well introduced analytics tools so that the data collected can easily be analyzed. However, most of these systems focus on assessing the weaknesses and strengths of the lecturers, the teaching effectiveness, the relationship between the students and the lecturers but they do not assess other factors like power availability and outrages, water availability and shortage, quality of accommodation, security, sports activities that also support students outside the academics.

2.6 Current Student-Based Faculty Evaluation and Feedback System (SBFFS)

Benefits to effective faulty evaluation include the scholarship of teaching and learning as well as improving the functionality and innovation of courses, curriculum, departments, and ultimately the broader community(Glassick, Huber and Maeroff 1997). The primary goal of this system is to access and enhance the overall quality of education provided by the institution. It involves collecting feedback on various aspects of teaching, learning and the faculty's overall performance to identify areas for improvement and to ensure the institution meets it educational objectives.

Despite a broad acceptance that effective evaluation tools should be developed for and with faculty, to date, faculty evaluation systems have been largely insufficient(Arreola 2000). In Uganda today, the current SBFFS is more based in institutions where it is used and time-consuming where the man power is needed to analyze the comments, suggestions or feedback provided by the students.

2.7 Challenges of The Current Student-Based Faculty Evaluation And Feedback System

Although many education institutions enjoy the benefits of EFFS, the following barriers are there in full functioning of the system; choosing the right vendors and hardware/software, insufficient financial resources to invest in improved technology, lack of time and human resources to use the system and anticipated problems in attempting to an integrated system.

Paper-based evaluation systems require considerable administrative effort for data collection, analysis, archiving and dissemination of results to faculty in a timely manner. Tracking responses and non-compliance with completion of evaluation forms can also pose a problem(Deretchin, Wheeler and Jefferson 1997). The current system requires more paper for the students to write their suggestions, comments or provide their feedback about the faculty members and the overall faculty performance. On additional, analyzing the data collected requires more time and man power to do so hence some data might be misplaced or omitted.

2.8 Benefits of The Student-Based Faculty Evaluation And Feedback Application

Although many scholars have written about faculty evaluation systems as an urgent requirement and a lot research has been carried out, implementation is still insufficient. However, according to the literature available, there are numerous benefits that accrue from student-based faculty evaluation and feedback applications when compared with manual systems. For example, there will be no duplication of records, the problem of missing or misplaced records is reduced. Students prefer electronic evaluation because it is fast and easy to use whereby students in remote areas can learn and assess I their locations with flexibility and ease(Alruwais, Wills and Wald 2018).

Paper-based evaluation systems require considerable administrative effort for data collection, analysis, archiving and dissemination of results to faculty in a timely manner, tracking response and non-compliance with completion of evaluation form can also pose a problem. In an effort to

overcome these shortcomings, many training programs have implemented electronic systems for communication purposes and/or evaluation of learners, faculty and programs(Rosenberg, Watson et al. 2001).

Chapter Three: Methodology

3.0 Introduction

This chapter described and presented the system design, data collection techniques and sampling strategies that were used in the study.

3.1 Area Of Study

The study was conducted at Busitema University-Nagongera Campus because of the ease in collection of data and due to the problem identified by the system. the study covered most of the departments of the faculty for example; academics, sports, power, water, security facilities among the others.

3.2 Sampling

This study involved 20 respondents from whom the data was collected from namely, 19 students and 1 administrator of lecturer. Simple-random sampling was used since it involved randomly selecting the respondents without grouping them.

3.3 Data Collection

3.3.1 Sampling Methods

The study considered simple-random sampling as it involved randomly selecting the respondents without grouping or categorizing them according to a specific topic. Henceforth interviews and questionnaires were used for data collection.

3.3.2 Questionnaires

These are a bunch of questions that aim to get answers from respondents. The questionnaire consisted of both open-ended and close-ended questionnaires so as the respondents to fully elaborate their thoughts and the results were finally complied from the collected questionnaires.

3.3.3. Interviews

This involves face-to-face interaction between the interviewer and the respondent. These were used to help explain more about the research subject and understand it better and also explore more of the opinions that were provided.

3.4 System Design

This describes how the functions of the system could be realized through the use of tools like context diagrams, data flow diagrams, use-case diagrams among the others.

The system used a Model View Presenter Architecture in order to handle requests and present data to the user. The model stored data for the application, the view acted as the user interface and it was used by the user to input data into the application and the presenter sent the data from the view to the model and also sent data from the model to the view.

3.4.1 Rapid Application Development (RAD)

RAD is a software development approach which does not follow a strict plan, focuses more on user feedback hence emphasizing rapid prototyping. The researcher opted for RAD because it was fast and less costly.

3.4.2 Use-Case Diagram

This represents the activities of the users with the special functionalities of the system. the use-case diagram was used to identify the different users of the systems and the different use cases.

3.4.3 Entity-Relationship Diagram

This is a graphical representation between entities and attributes within a proposed database of the system. the ERD was used to show the different entities in the system with their different attributes and how they are related.

3.4.4 Context Diagram

This shows the basic interaction of the system with it environment. The context diagram showed the flow of data in the system.

3.5 System Implementation Tools

The tools employed in the implementation of Student-based faculty evaluation and feedback application were as follows;

Android operating system was used as the operating system to enable the user interact and use the application.

Android studio was used as the Integrated development Environment (IDE) that was used to develop application and was as the code and layout editor to design and preview the user interface.

Java programming language was used as the technology for building the application to run on the client-side.

Firebase Realtime cloud database was used the database management system which was used to store and synchronize data in real-time.

3.6 Testing And Validation

Unit testing and integration testing were performed on the student-based faculty evaluation and feedback system in order to reveal the possible errors.
Unit testing was focused on one module at a time where a module would be tested instantly to ensure its functionality before proceeding for another module.
Integration testing was on performed after all the different modules had been put together to make a complete system. it aimed at the fact hat all the modules of the system worked hand-in-hand to present a complete working system.

Chapter Four: System Analysis and Design

4.0 Introduction

This chapter presents the results from the system analysis as well as the strengths and weaknesses of the current system. This chapter covers the system requirements (user requirements, functional and non-functional requirements) and the design of the system.

4.1 Current System Study

In the academics of Busitema University-Nagongera Campus, a comprehensive study unfolded, casting light upon the prevalent paper-based faculty evaluation system. This exploration aimed not only to understand the challenges entwined with the existing system but also to uncover its inherent strengths. The study embraced data collection techniques with interviews serving as the primary conduit for insights.

The canvas of the current system portrayed a traditional methodology where evaluation questions were written onto paper, becoming vessels for student ratings, suggestions, comments and challenges. These paper instruments were delivered to students disseminating their perspectives on the educational landscape and then are gathered for submission.

Behind the scenes, administrators assumed the role of custodians, ushering in the next act of this academic session. The collected papers changed into a repository of valuable insights, awaiting the sharp gaze of administrators. With meticulous care, the administrators undertook the task of unraveling the narrative inscribed on these pages. Ratings were counted, comments were examined and suggestions were noted, each element finding its place in a carefully maintained record for future reference.

The examination of the current system delved into the dynamics between paper, pen, students and administrators. The information harvested through interviews became the building blocks for a new system design where the echoes of student voices, once confined to the pages of the evaluation sheets, resonated in the corridors of academia serving as a call for progress. This study reflects not just a quest for technological innovation but a profound understanding of the symbiotic relationship between systems and the human experience within education. As the study unfolds, it is an evolution from ink and paper to the digital frontier.

The current system, a relic of tradition, faces scrutiny and introspection, paving the way for a future where the exchange of the ideas and feedback transcends the limitations of physical mediums. This study emerges as a catalyst for a change, that champions the intersection of tradition and progress in the pursuit of educational excellence.

4.2 Strength Of the Current System

In the academics of Busitema University-Nagongera Campus, an exploration into the prevailing paper-based faculty evaluation system unveils a multi-layered discussion. This tradition system boasts inherent strengths that have shaped its role in the educational institution. This system is not merely a method of record-keeping but a cultural cornerstone, providing a sense of familiarity and accessibility to students.

The first strength lies in the system's ability to bridge the digital divide. In a world increasingly reliant on technology, the paper-based system becomes a conduit for

inclusivity. It caters for a wide spectrum of students, including those who may lack access to technology or those who are not comfortable navigating digital interfaces. By embracing a method that transcends the boundaries of technological proficiency, the current system ensures that every student's voice finds resonance in the evaluation process.

Furthermore, another facet of strength lies in the system's resilience against technical challenges. Unlike their digital counterparts, the paper records are immune to system failures, cyber threats and even technical glitches. This robustness not only ensures the security of the records but also safeguards the integrity of the evaluation process. Storing the tangible records in a private location enables to preserve the authenticity of student feedback.

The third strength unfolds in the tangible nature of the records themselves. In a world increasingly transitioning into the digital realm, the physicality of these records provides a tangible connection to the feedback process. Stored in files, these records become proof in the journey of the faculty progress, an archive that can be revisited and reviewed with ease. The tangible nature of these records adds a layer of permanence to the otherwise world of digital data.

Lastly, the current system ensures independence from technological dependencies. In an era where specific devices, internet connectivity and digital literacy are prerequisites for many systems, the paper-based approach stands as evidence to simplicity and accessibility. Feedback collection remains effective, irrespective of the availability of devices like mobile phones or laptops or the need for an internet connection.

In conclusion, the advantages of the paper-based approach are not the only ones recognized, but also its cultural significances within the academic institution where it emerges as a resilient guardian of inclusivity, security and tradition.

4.3 Weakness Of the Current System

Under the faculty evaluation and feedback system at Busitema University-Nagongera Campus, the current system, while boasting some strengths, harbor a multitude of inherent weaknesses. The flaws in this paper-based approach become apparent, casting shadows on its efficiency and effectiveness.

One obvious weakness is the persistent issue of delays in the processing of evaluation papers. The complicated process of waiting for these papers to be submitted as a collective batch introduces a considerable lag. Members, taking their time to respond to the evaluation questions, contribute to a delay in the overall collection process. This asynchronous submission method where everyone hands in their papers at their convenience, poses a significant hurdle to the timely progression of the evaluation workflow.

Administrative inefficiencies further compound the challenges of the current system. the inherent nature of a paper-based approach translates into extended timelines for administrators to obtain written feedback. The demanding task of organizing and analyzing the multitude of written responses requires a substantial investment of time, creating administrative overhead. This cumbersome process not only delays the

dissemination of feedback but also places a strain on the administrative resources dedicated to handling the huge paperwork.

The spatial challenge emerges as yet anther weakness in the current system. the continuous influx of evaluation papers, coupled with the sheer volume of students, results in the consumption of a significant amount of physical space over time. The evaluation papers, preserved for future reference, necessitate expansive storage areas, further complicating the logistical aspect of the system.

Another most concerning weakness is the vulnerability to loss inherent in the paper-based approach. The evaluation papers, crucial for future reference, become vulnerable during the various stage of analysis, collection and storage. Instances of papers getting lost pose a tangible risk, potentially eroding the integrity of the evaluation process and diminishing the value of historical feedback data.

In essence, the weaknesses of the current faculty evaluation and feedback system cast a cloud over its functionality. This therefore calls for an innovative, digitized solution in order to increase efficiency, accessibility and reliability within the educational evaluation process.

4.4 System Analysis

This section focuses on the user, functional and non-functional requirements that guide the design and implementation of the student-based Faculty Evaluation and Feedback application.

4.4.1 Functional Requirements

The functional-requirements of the student-based faculty evaluation and feedback system emerge as crucial pillars defining user experience. These requirements define the services that the system aims to deliver, catering to the diverse needs of both the students and the administrators.

At the forefront of these functional requirements lies the students' interaction with the application. The student experience seamless journey starts where they log into the application with their email and password. Once authenticated, students gain access to the platform that allows them to navigate various faculty sections including power, sports, security and many more. Within each faculty section, students are empowered to engage with the evaluation process by answering questions, provide ratings and offer valuable suggestions or comments pertaining to the facilities. This user-centric design fosters an environment where students become active participants in shaping the educational landscape contributing their insights to the ongoing process of improvement.

On the administrative side, the functional requirements cater to the needs of those tasked with overseeing the system. administrators, equipped with the authority granted by the application, possess a set of capabilities designed to streamline their responsibilities. They wield the power to add new students to the systems, and can edit student information, ensuring its accuracy and relevance in the system's database.

The feedback loop is completed with the ability o view feedback submitted by the students gaining valuable insights into the collective sentiment. Ratings provided by the students are also at the fingertips of administrators, offering a comprehensive overview of the faculty's performance.

The work of the functionalities forms the backbone of the system, providing a harmonious collaboration between the students and the administrators. The user requirements reflect a commitment to accessibility, usability, transparency and empowering students to actively contribute to the improvement of their educational environment. Simultaneously, administrators are equipped with the tools necessary to efficiently manage and harness the wealth of feedback generated by the students.

4.4.2 Non-Functional Requirements

When designing the student-based faculty evaluation and feedback application, the focus extends beyond the specific functions the system performs, it encompasses a set of non-functional requirements that a play a crucial role in shaping the system's overall performance and user experience. These requirements include user-friendliness, performance and data integrity forming pillars upon which the application's effectiveness stands.

User-friendliness emerges as a cornerstone of the non-functional requirements. The application is built to be user-friendly, ensuring that every interaction with the system is intuitive and accessible. From the easily understood icons to the user-friendly language, the design is geared towards creating an interface that resonates with users, making their journey through the application seamless and comprehensible.

Performance is another non-functional requirement that steers the application's functionality. A requirement for the application's optimal performance is an active internet connection given that it relies on a cloud database for its operations. In the realm of connectivity, the application responds dynamically; with a fast connection, its performance surges, ensuring a swift and efficient user interaction. And on the contrary, with a slow connection, the application adapts, operating a at a slow pace.

Lastly, there is data integrity which acts as a concern in any digital system, is part of the non-functional requirements. With the usage of the Firebase cloud database, the application has a strong and robust defense against data loss. The use of this cloud-based database acts as a solution ensuring that the user-generated data is secure and retained. The resilience of the system is underscored by the fact that data loss is only a potential risk if intentionally deleted by an administrator with database access, providing a layer of control while preserving the integrity of the accumulated feedback and evaluation data.

In conclusion, these non-functional requirements do not just reveal technical specifications but a commitment to user-centric design, performance, adaptability and data security. These requirements become an invisible thread weaving through the

student-based faculty evaluation and feedback system ensuring its responsiveness, reliability and resilience in the dynamic nature of academics.

4.5 Hardware/Software Requirements

4.5.1 Hardware Requirements

In the evolving technological advancements, the hardware requirements for the student-based faculty evaluation and feedback system emerge as a crucial component shaping of this foundation attempt.

At the forefront stands the Uninterruptible Power Supply (UPS), which guards against the unpredictable whims of power fluctuations. In the dynamic realm, where continuity is paramount, the UPS acts as a sentinel, providing a seamless power backup. It ensures that the researcher still writes the codes and works with the system even in the face of unexpected power outages.

Secondly is the Random Access Memory (RAM), a reservoir for the system's immediate data needs. With a stipulated minimum of 8GB, the RAM becomes the pulse of the system facilitating swift and efficient data processing. This ample RAM capacity ensures that users experience, responsiveness and fluidity navigating the platform without any delays.

Lastly is a universal hard disk that takes center stage with a minimum requirement of 100GB. This spacious digital canvas becomes the repository for the system's data, accommodating the diverse array of evaluations and feedback and administrative records. the universality of this hard disk ensures adaptability, providing ample room for the system to grow, evolve and continuously accumulate data without the hindrance of storage limitations.

In conclusion, these hardware requirements become the silent architects that shape an infrastructure that not only sustains but propels the student-based faculty evaluation and feedback system into the digital frontier of academic innovation which also lays the groundwork for its future expansion and adaptability to its evolving needs.

4.5.2 Software Requirements

In the dynamic intersection of technology and academics, the software requirements for the prospective student-based faculty evaluation and feedback system emerge as keystones in the foundation of this innovative venture. These requirements, each with its unique role collectively shape the digital ecosystem that promises to revolutionize the landscape of the educational feedback and evaluation.

At the forefront stands the windows 10 and higher, which provides astable and compatible operating environment for the system. known for its robust features and widespread compatibility, it becomes a canvas on which the application' s code is written.

Secondly, android studio takes the center stage as the IDE of choice. This is where the application code and layouts are written. Android studio not only ensures compatibility

with Android devices but also optimal performance and responsiveness. This choice aligns with the diverse technology landscape, recognizing the prevalence of Android-powered devices in the hands of both students and administrators.

In this digital age, where technology and education converge, these software requirements become the digital infrastructure shaping a future where the faculty evaluation and feedback are not just processes but transformative experiences. The choice of these software elements is a strategic decision aimed at creating a system that not only meets but exceeds the expectations of a diverse and dynamic academic community.

4.6 System Design

This is the process of defining the architecture, modules and interfaces of the system to realize the functionality of the system. it includes stages like system architecture, context diagram, data flow diagram, and system modelling using case diagrams.

4.6.1 System Architecture

When designing the student-based faculty evaluation and feedback system, the architectural framework chosen plays a crucial role in shaping the structure and functionality of the application. In this context, the system opted for the Model-View Presenter (MVP) architecture; a sophisticated and strategic choice that not only enhances the application's efficiency but also elevates the overall user experience.

At the core of the MVP architecture, the View component is a visual gateway into the application. It serves as the user interface, an interactive canvas through which users engage with the system. its role extends beyond mere display; it's a conduit for data presentation and user interactions. The users used this view component to seamlessly navigate, submit evaluations, view comments provided by the students and interact with other features of the application.

Furthermore, complementing the view, is the Model component emerges as the data powerhouse of the system. it serves as the repository, diligently storing and managing the vast array of data generated by the application. Beyond being a passive storage entity, the Model exposes methods that facilitate not only the retrieval of data but also its manipulation. This dynamic interaction with data ensured that the application remained agile, responsive and capable of adopting to the evolving needs of both students and administrators.

Furthermore, the Presenter component acts as an intermediary between the View and the Model as it handles the communication between the View and the Model. The presenter becomes the intelligence behind the scenes, interpreting user inputs and updating the model accordingly. This dynamic interaction ensured that the application responds promptly to user actions, maintain a harmonious flow between the visual interface and the underlying data structure.

The practical manifestation of the MVP architecture within the system unfolds in a way that when a student interacts with the user interface (View), the presenter interprets these actions, updating the underlying data (Model) accordingly. This bidirectional

flow ensures that user interactions are not just visual changes but trigger tangible responses within the application's data structure.

In adopting the MVP architecture, it became a guiding philosophy, fostering a modular and organized approach to system design. The separation of concerns between the view, model and presenter components not only enhances maintainability but also allows for flexibility in adapting to future modifications. The MVP architecture, as employed in the student-based faculty evaluation and feedback system is a strategic decision that converges technology and user experience creating an application that is not only robust but also intuitively responsive to the needs of its academic community.

4.6.2 Context Diagram

This summarized how information flowed in the system.

The student could visit the application and answer the evaluation questions and provide comments or suggestions.

The administrator could visit the application add and edit student information, view student ratings and comments.

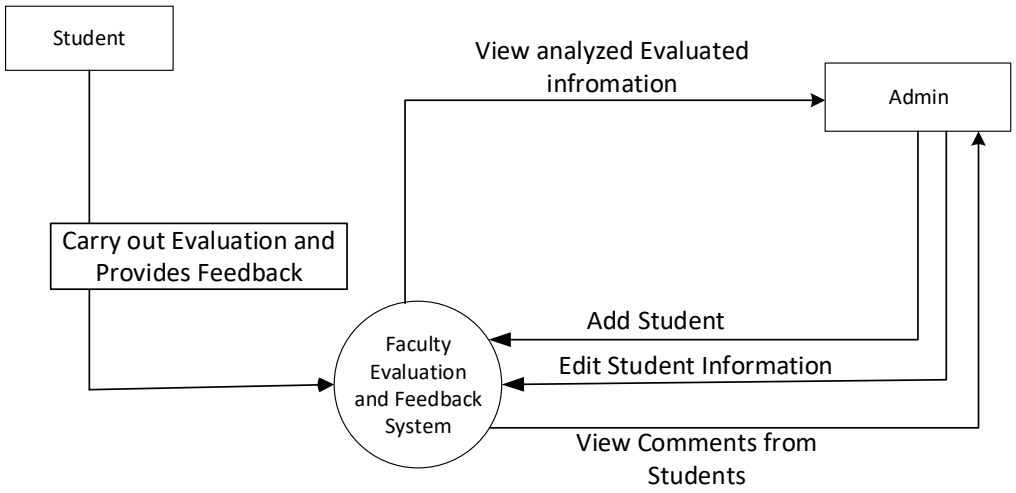

Figure 1. Context Diagram of SBFFS

4.6.3 Use-Case Diagram

The use case diagrams for each entity presented in the proposed system include the use case diagram for the student and administrator which showed the different activities performed by the users of the system.

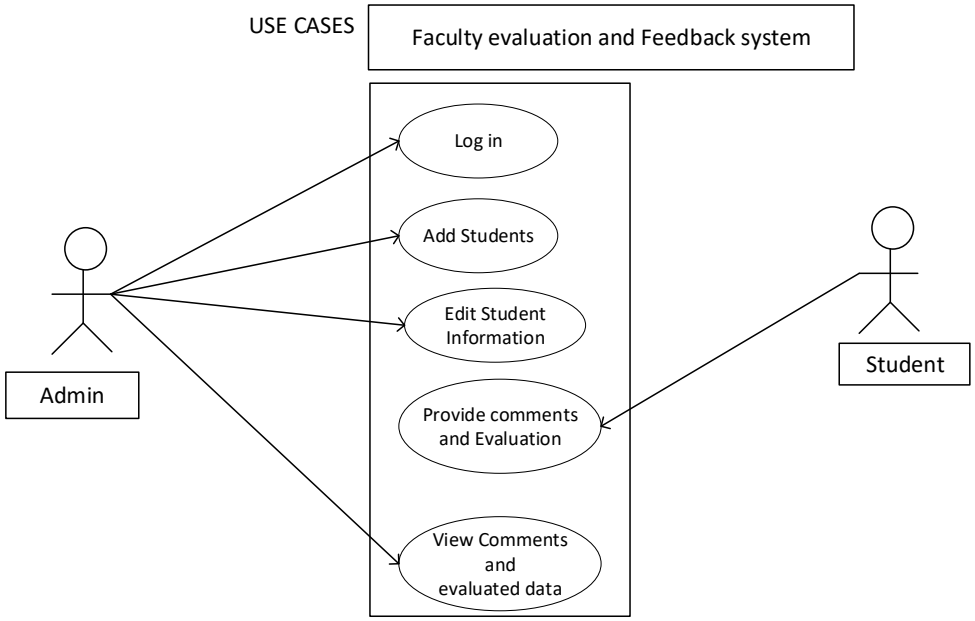

Figure 2. Use-Case diagram of SBFFS

4.6.4 Entity-Relationship Diagram

This describes things of interest and is composed of entities and the relationships that exist between the entities.

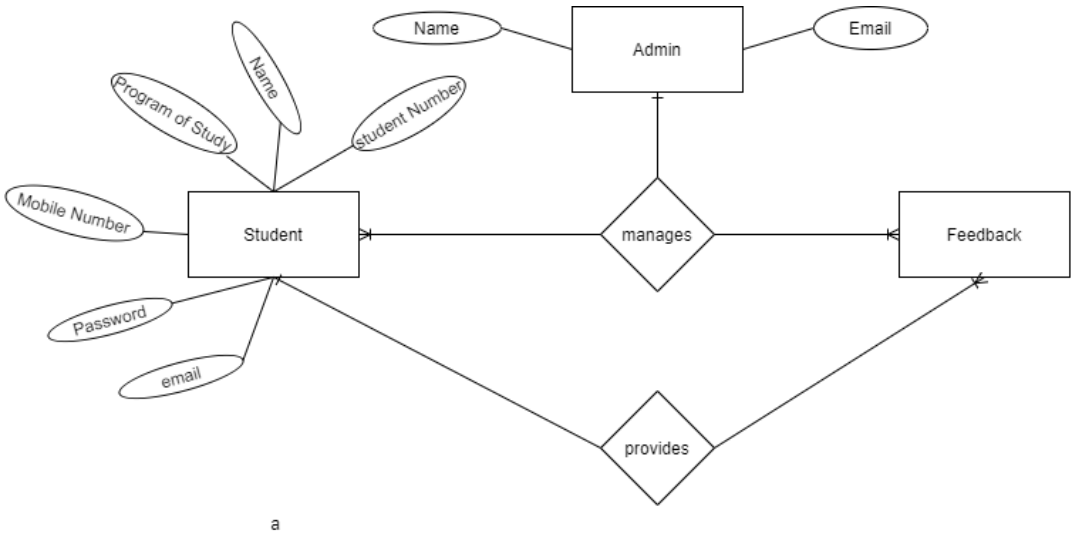

Figure 3. ERD OF SBFFS

4.7 Implementation And Testing

This is where the actual development of the student-based Faculty Evaluation and Feedback application happened which included developing the Graphical User Interface (GUI), creating the application database that is Firebase Database and Android Studio was used as the Integrated Development Environment (IDE) and text editor and java was used the programming language for building the application.

All components of the application were tested to ensure its proper functionality as per the users' expectations.

Chapter Five: Implementation And Testing

5.0 Introduction

This area focused on fulfilling the use of the functional and non-functional requirements into a working system. It presented the implementation of the design presented in chapter Four.

5.1 Interface Design

The goal of user interface design is to make the user's interaction with the system simple and also acts as a way through which the user interacts with an application. It focused mainly on the looks and styles of how the application appeared to the users i.e. the students and the administrator in this case.

For all the users, when they opened the application, they were able to access the loading screen. This screen was able to ensure that when the student or administrator had internet connection, they were able to access the application and with no internet connection, they wouldn't be able to access the application.

Interface for the loading screen

Figure 4. loading screen

On loading the page, the users were able to access the log in page. This page was to ensure that students and the administrators were able to verify whom they are and also prevent students from logging into the system as administrators.

Interface for the login screen

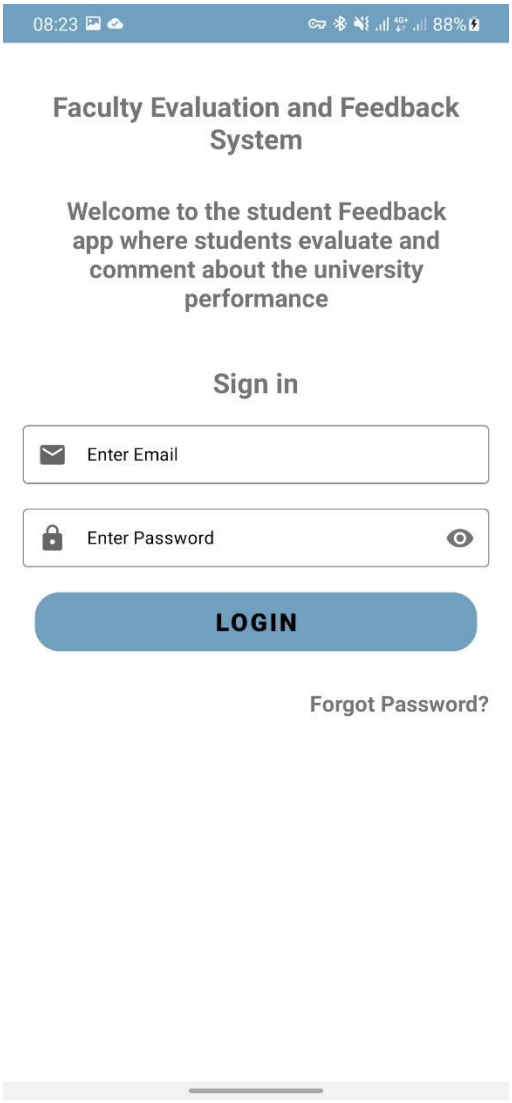

Figure 5. login screen

After accessing the login screen, the users were able to access their different modules either as a student or an admin.

For the student, he/she was able to access the student dashboard that had various sections of the faculty in order to provide their feedback and evaluation. The student dashboard enabled the students to access the different departments of the faculty at ease.

Interface for the student dashboard

Figure 6. student dashboard

After accessing the student dashboard, he/she was able to select on one of the sections in order to carry out their evaluation and provide feedback.

Interfaces for the evaluation and feedback questions

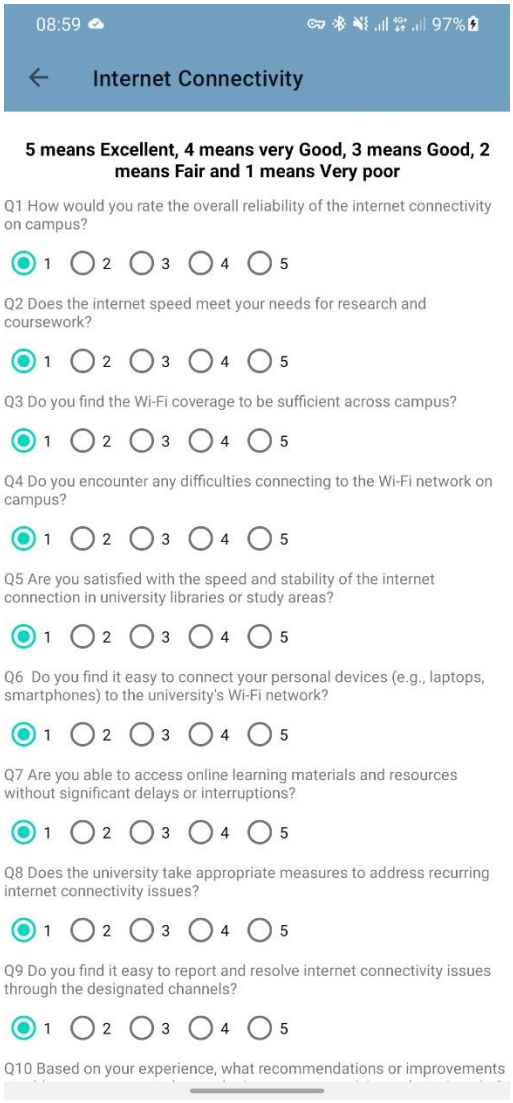

Figure 7. evaluation questions

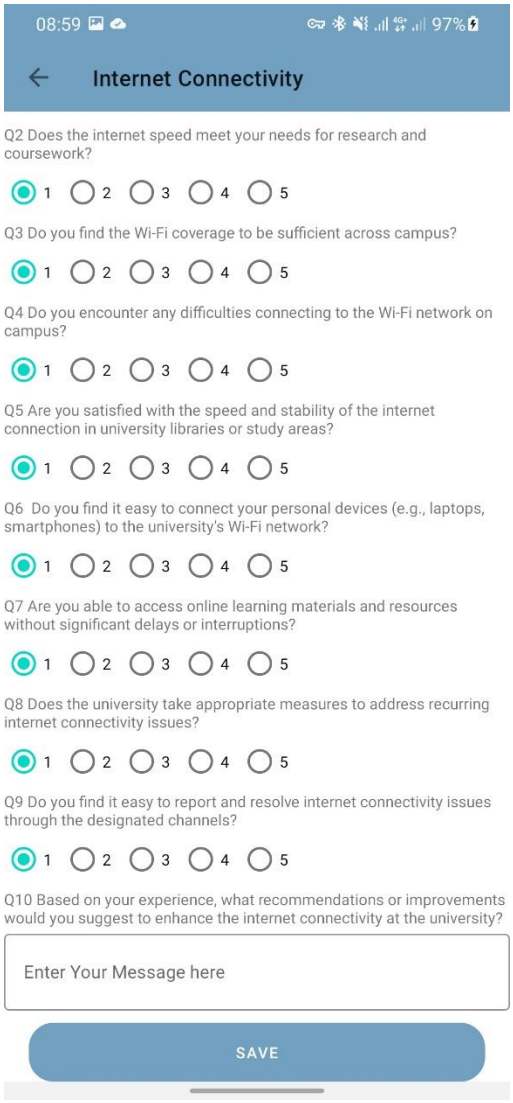

Figure 8. evaluation questions

For the administrator after logging in to the application, he/she was bale to access the admin dashboard.

Interface for the admin dashboard

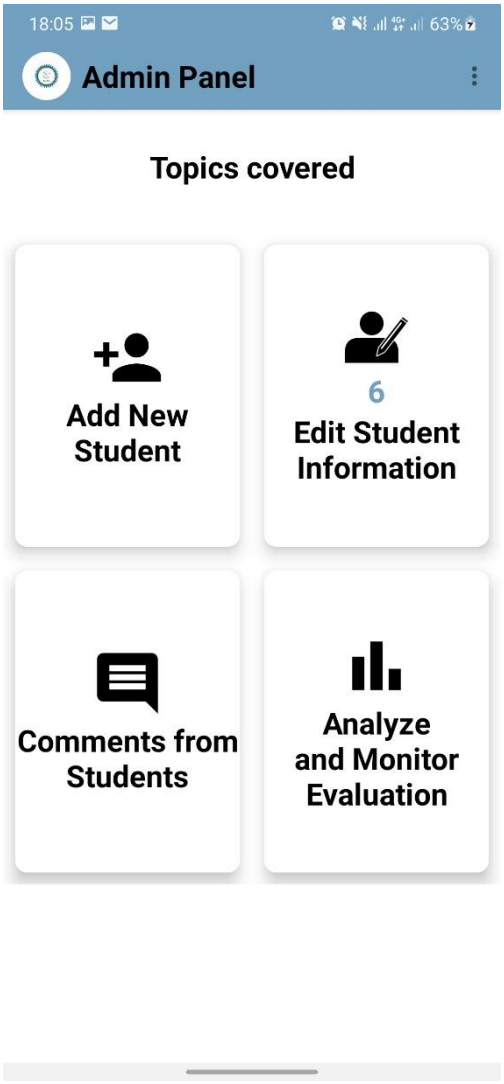

Figure 9. administrator dashboard

On accessing the dashboard, the admin was able to choose the items on the dashboard. He/she was able to add new student information. Incase the student information was not in the database, the admin would add the new student to the database so as the student to access the application.

Interface for adding new student information

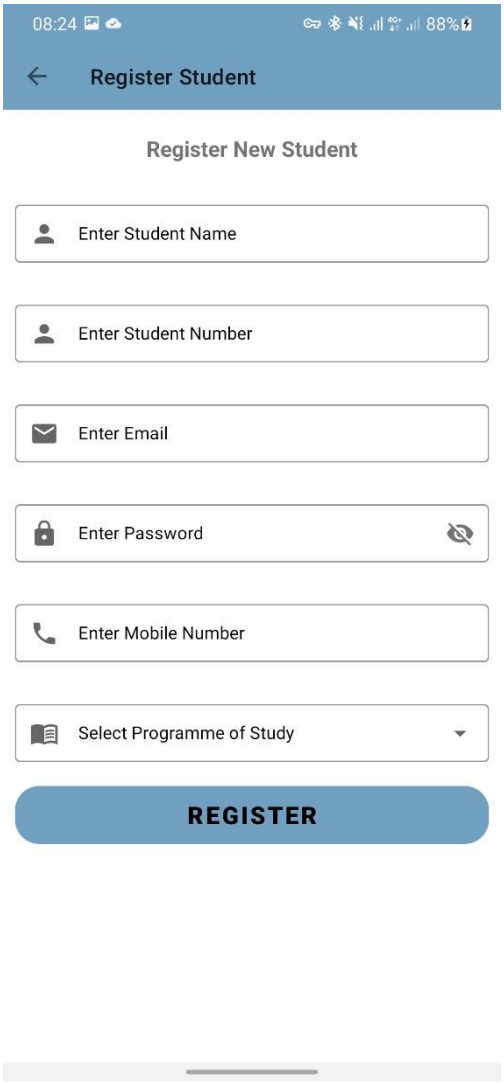

Figure 10. add new student screen

The admin was also able to edit the student information by either deleting the student information or making an update to the student information. With the wrong email account or password, the student would not be able to access the application, so in order to access the application the student information had to be edited and updated in the database so that he/she could access the application and carry out the evaluation process.

Interface for editing student information

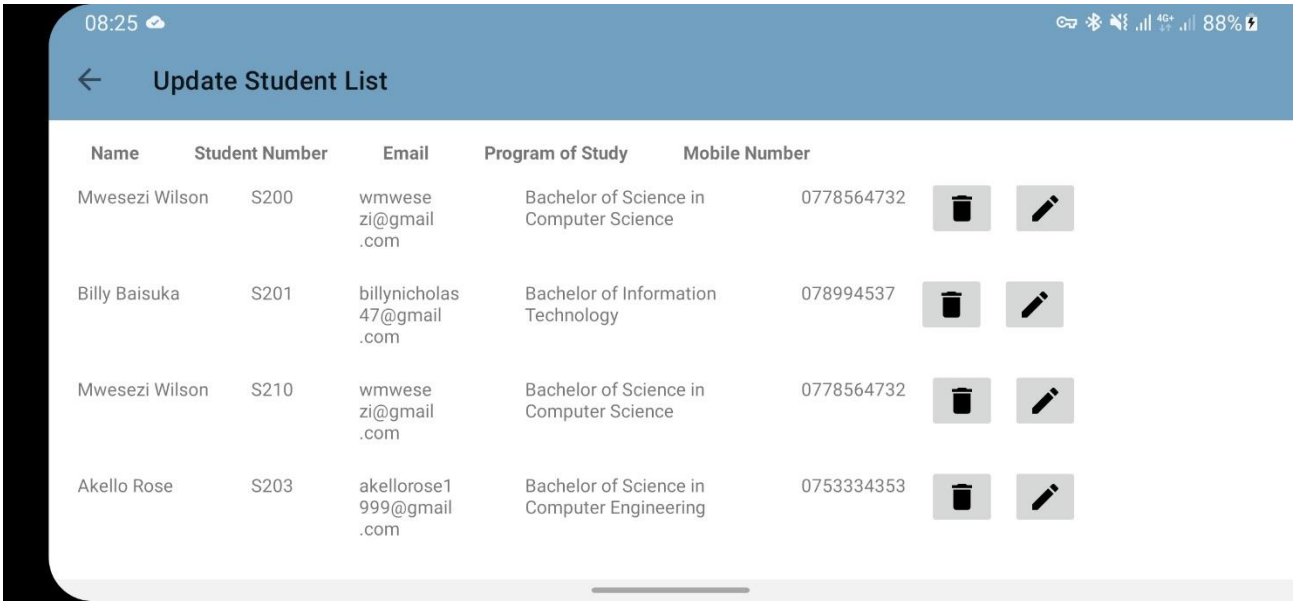

Figure 11. edit student information screen

The admin was also able to view comments that were provided by the students. Without need to view comments from the database, an interface to view the comments by admin was created to enable him/her to easily access the comments without first accessing the database.

Interface for the comments' dashboard

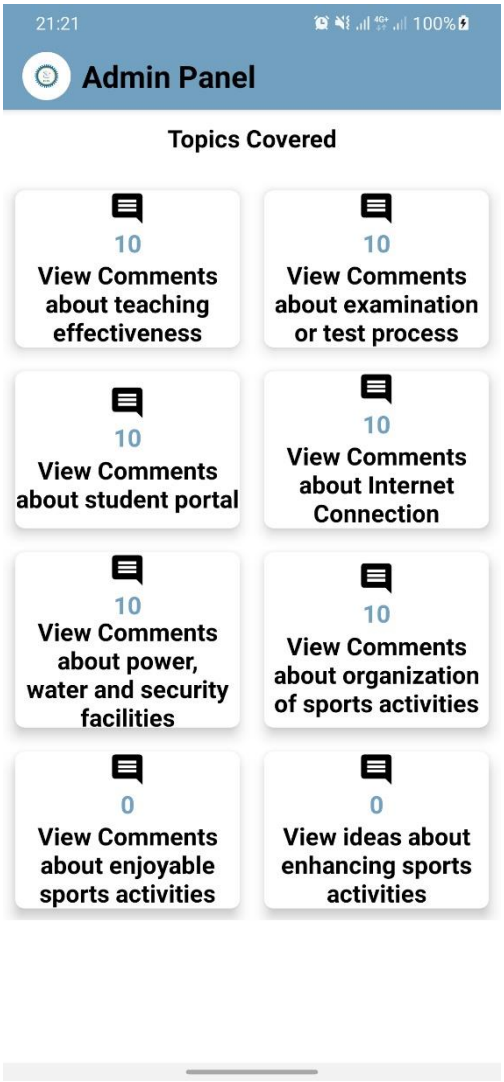

Figure 12. comments dashboard

After accessing the comments dashboard, the admin was able to view comments provided by the students in every section.

Interface for the comments

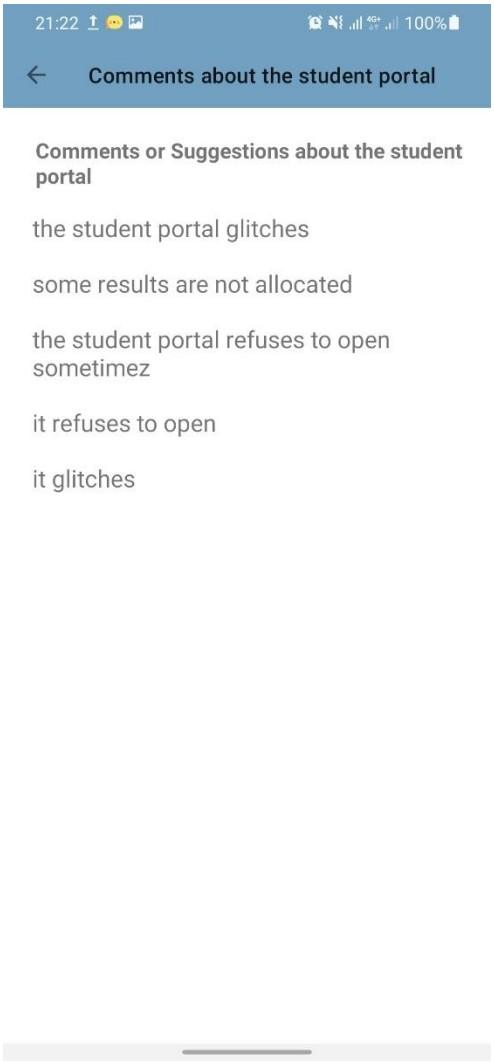

Figure 13. comments written by students' screen

The admin was also able to view the analyzed ratings. Without accessing the database to count the ratings provided by the students, the admin was able to view the ratings provided by the students through the usage of pie charts with their percentages.

Interface for the analyzed ratings

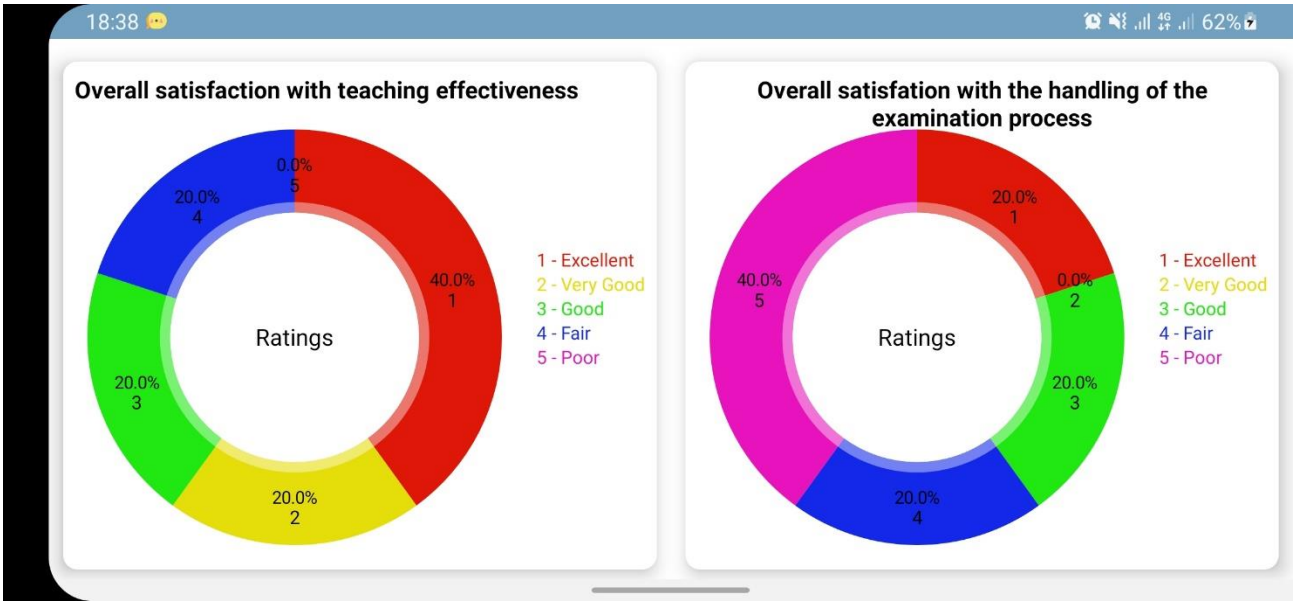

Figure 14. analyzed ratings

5.2 Data Storage

The application stored the administrator information, students' information, ratings and feedback to the firebase Realtime cloud database which stores information in form of nodes. Some of the nodes include;

Admin node

This captured the administrator's details like the email account and the name

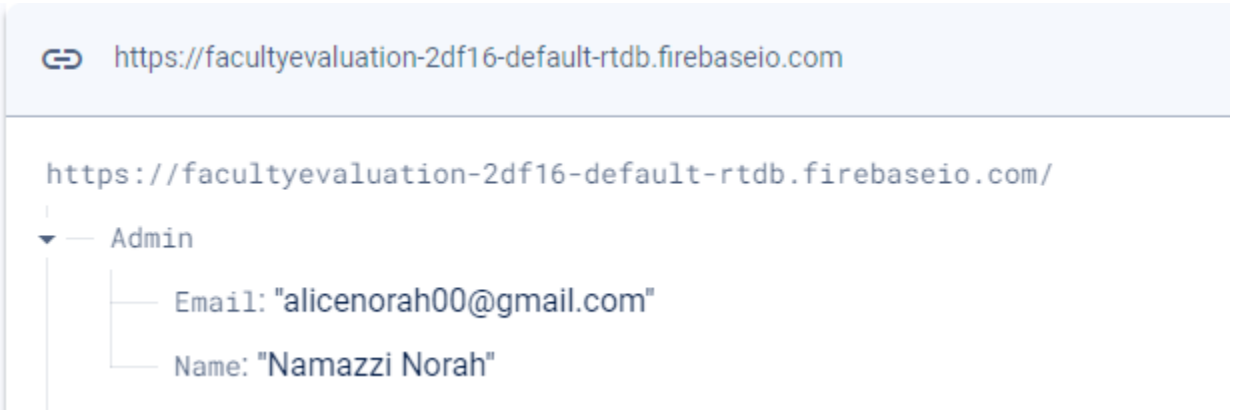

Figure 15. admin node

Students' node

This captured the students' details like email account, name, the program of study, the student number and the mobile number.

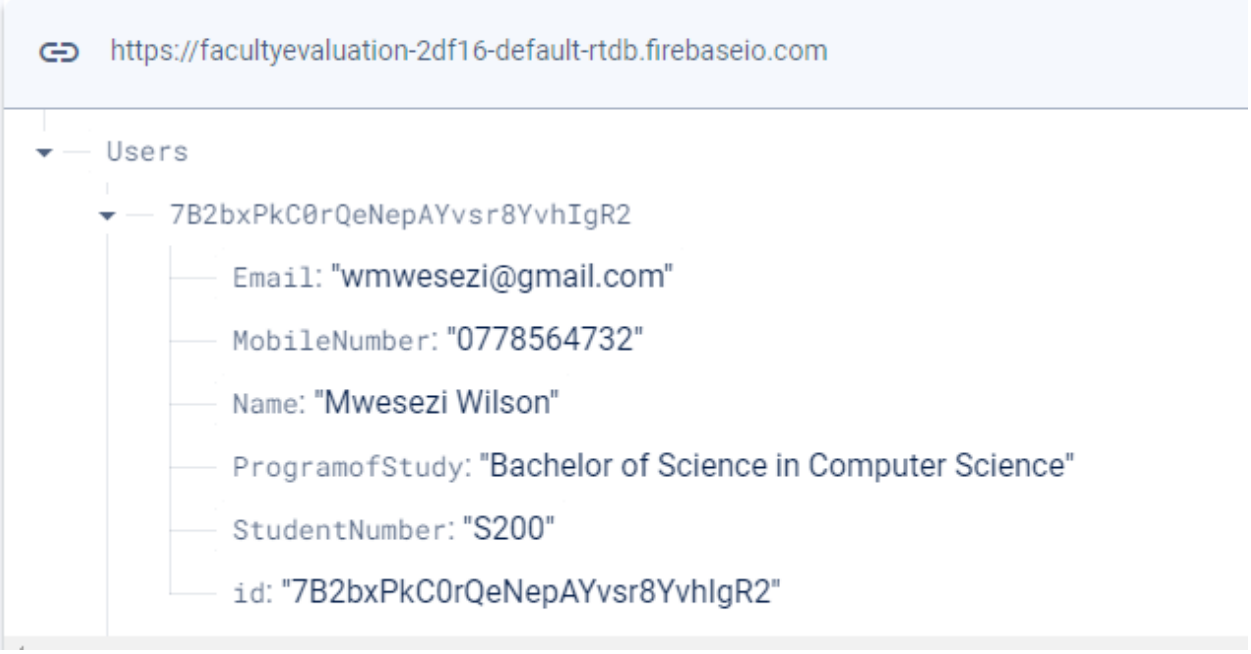

Figure 16

The student portal evaluation node.

This captured all ratings and the suggestions/comments that were provided by the students about the student portal.

Figure 17

The internet connection node

This captured all the ratings and the suggestions/comments that were provided by the students about the internet connectivity.

Figure 18

5.3 System Testing

the entire application was tested to ensure the accuracy and efficiency of the system before it was given to the users and it required a different series of tests at different levels. It was done in two formats that is unit testing and integration testing.

5.3.1 Unit Testing

This was done on individual codes of the application to ensure that they were fully functional. This was done examining each module to ensure that it had no errors.

5.3.2 Integration Testing

This was done after all the different modules were completed and put together to ensure a complete and working system. this aimed at ensuring that the modules worked hand in hand in order to form a complete working system.

Chapter Six: Discussion, Conclusion, Recommendation and Future Work

6.0 Introduction

In this chapter, we discuss the findings for developing the faculty evaluation and feedback application in relation to the set objectives and methodology. The study found that the faculty relied on the manual system to carry out the evaluation and feedback system for both the administrators and the students i.e. the students answering the evaluation papers and providing their feedback and the administrators consuming a lot of time and space for storing the papers and analyzing them. The faculty evaluation and feedback application that was developed focuses on replacing the manual system for efficient delivery, storage and analyzation of the evaluation and feedback process.

6.2 Discussion

The discussion of this chapter is based on the theme of the objectives stated in chapter one of which the researcher followed into enhancing the student-based faculty evaluation and feedback system.

The researcher tackled the first objective which was to determine the requirements of the student-based faculty evaluation and feedback system. inspired by this objective, the requirements were discovered from two sources: filed research and library research. Under library research, the researcher studied evaluation systems that were made about the same topic and served as a guiding star for the project. The library research yielded not only functional but also non-functional requirements, shaping the destiny of the forthcoming application. Meanwhile, in the field, the researcher got to know how manual system worked, unveiling the secrets hidden within the perceptions and views of the system's users and the revelations became the foundation for the design of the application interfaces.

With the requirements all in place, the researcher ventured into the second objective which was to design the student-based faculty evaluation and feedback system. Following the path of Rapid Application Development (RAD), the researcher was able to come up with the designs of a context diagram, use-case diagram, entity-relationship diagram and a data-flow diagram which enabled the smooth flow of data in the system.

As the design phase unfolded, the researcher ventured into the third objective which was to implement the student-based faculty evaluation and feedback system. The researcher used implementation tools such as Android studio, Firebase Realtime cloud database, windows operating systemin order to come up with the interfaces in chapter 5 which include the login screen, student and admin dashboard, comments section among the others.

With the foundations laid and the interfaces designed, the researcher faced the fourth objective which was to test the student-based faculty evaluation and feedback system. The system was tested during and after implementation through unit and system testing. The researcher used unit testing to test the individual modules of the code whereby every part of the interface was well tested to check whether it works properly. This was essential during the identification of the errors in

specific units of the code thereby making debugging quite an easy task. The researcher then carried out integration testing which was done after all the different modules had been put together to make a complete system. Integration aimed at ensuring that all the modules of the system worked hand in hand and that they could be integrated to form a complete working system.

And so, the researcher's academic journey concluded, leaving behind a legacy of a robust and transformative student-based faculty evaluation and feedback system.

6.2 Conclusion

The student-based faculty evaluation and feedback system should be deployed for use since most of the users agreed that the system performs its functions that suit their needs especially when it came to addressing majority of the challenges that the existing system presented as already discussed in the previous chapters, specifically in the problem statement.

6.3 Recommendation

I strongly recommend the widespread adoption of my student-based faculty evaluation and feedback system across various educational institutions especially those relying on the manual evaluation and feedback process. The implementation of this innovative system holds significant potential to revolutionize traditional evaluation methods and bring about a great number of benefits.

Firstly, the integration of the faculty evaluation and feedback system is a step towards environmental sustainability whereby educational institutions can contribute to a greener and more eco-friendly future by reducing reliance on cumbersome paperwork and also lowers the overall environmental foot print associated with manual record-keeping and storage.

Furthermore, the adoption of this system enhances the efficiency and effectiveness of the evaluation process. Real-time data analysis and reporting capabilities empower institutions to promptly identify areas of improvement. The automated features streamline the entire workflow, saving valuable time for both students and faculty members.

In additional to more efficiency, the digital nature of the system facilitates continuous data management. The database ensures secure storage and ease retrieval of evaluation data, promoting transparency and accountability. Institutions can use this information to make informed decisions regarding faculty development.

Moreover, the student-based approach inherently promotes inclusivity and stakeholder engagement. By involving students in the evaluation process, institutions not only empower them to contribute to the improvement of the educational experience but also foster a sense of ownership and responsibility which strengthens the student-faculty relationship and creates a more harmonious and learning environment.

In conclusion, the adoption of my faculty evaluation and feedback system is not just a mere technological upgrade but a strategic move towards a sustainable, efficient and student-centric educational ecosystem. I therefore, urge educational institutions to embrace this transformative tool to introduce in a new era of educational excellence, where innovation and environmental responsibility go hand in hand.

6.4 Future Work

In today's rapidly evolving educational landscape, the integration of technology is crucial for fostering efficiency, transparency and continuous improvement. While the student-based faculty evaluation and feedback system is a significant jump forward, several key enhancements can further elevate its impact.

Firstly, the current system has been optimized exclusively for Android mobile phones. To enhance accessibility and inclusivity, there is a pressing need to extend support to other mobile platforms such as iOS. By ensuring compatibility with a diverse range of devices, the system can cater for a broader user base, accommodating the preferences and technological choices of both students and faculty members.

In addition to expanding device compatibility, transitioning to a web-based platform emerges as a pivotal step forward. A web-based system offers unparalleled accessibility, allowing users to access and modify evaluations from any device with internet connectivity. This not only simplifies the user experience but also facilitates real-time collaboration and updates. The integration of the system into a web environment ensures that stakeholders can engage with it effortlessly, fostering a more dynamic and interconnected educational ecosystem.

To fully maximize the utility of the system, the addition of analytics capabilities is strongly recommended. Analytics can provide valuable data-drive insights into the evaluation process, help identify trends, strengths and areas of improvement. The integration of analytics not only empowers educational institutions to make informed decisions but also contributes to a culture of continuous improvement by facilitating evidence-based strategies for faculty development.

Furthermore, the inclusion of department-specific evaluations is paramount for a comprehensive and targeted assessment of faculty performance. By tailoring evaluations to individual departments, the system can provide more insights into the unique challenges and strengths of each department. This customization not only enhances the relevance of feedback but also enables more targeted faculty development initiatives, thereby contributing to the overall improvement of educational quality.

Lastly, the importance of regular system maintenance cannot be left out. Routine maintenance is essential to ensure optimal performance, address any technical glitches and errors promptly, and incorporate updates. A well- maintained system not only guarantees a smooth user experience but also reflects a commitment to excellence in technological infrastructure.

In conclusion, by broadening device compatibility, transitioning to a web-based platform, incorporating department-specific evaluations, integration of analytics and prioritizing regular system maintenance, the student-based faculty and feedback system can evolve into a robust and indispensable tool for fostering educational excellence but not only address the current limitations but also lay foundations for a future-proof and adaptive system that aligns seamlessly with the ever-changing landscape of education.

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At A Large University, Ratings Of Faculty Infive Academic Areas Were Collected From Two Groups Ofstudents Using Paper-And-Pencil And Electronic Surveyadministration Modes. Factor Analyses Performed On Both Sets Of Data Showed That The Two Modesyielded Similar Factor Patterns. A 2 5 Manova Indicatedthat Ratings Were Significantly Influenced By Academicarea ($P < .001$) But Not By Survey Method. A High Percentage Of Students In Both Groups Feltconfident That Their Ratings Were Anonymous, Thoughanonymity Ratings Were Significantly Higher ($P <.001$) In The Paperand-Pencil Group. Students'satisfaction With The Mode Of Administration Wassignificantly Higher ($P < .01$) For The Electronicgroup Than For

The Paper-And-Pencil Group. Overall,Results Suggest That The Electronic Survey Mode Is Aviable Alternative To The Paper-And-Pencil Mode Ofadministration.

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