

**SCHOOL GRADING SYSTEM FOR KYAMAKANDA SECONDARY SCHOOL
RUKUNGIRI**

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**A DISSERTATION SUBMITTED TO THE FACULTY OF ENGINEERING, DESIGN AND
TECHNOLOGY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD
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UGANDA CHRISTIAN UNIVERSITY**

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DECLARATION:

I AYAN FATUMAH declare that this work is original and has not been submitted to any other university for the award of degree in information and technology and it is done out of my knowledge

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Signed


.....

APPROVAL

This is to certify that AYAN FATUMAH, (S22/BBUC/BSIT/013), will submit this project "SCHOOL GRADING SYSTEM" in partial fulfilment of the requirement for the award of degree in information and technology at Uganda Christian University Bishop Barham University College is a record of this candidate own work carried out by him under my supervision.

MR. SIBOBUGINGO BENSON

Signature.....

Date.....07/11/2024

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ABSTRACT

The proposed project is a SCHOOL GRADING SYSTEM for KYAMAKANDA SECONDARY SCHOOL located in Rukungiri District, Uganda. With the implementation of the new curriculum by the National Curriculum Development Centre (NCDC), schools are facing challenges in adopting a grading management system that aligns with the new curriculum. This study aimed to design and develop a system to streamline the grading process for Kyamakanda Secondary School, covering four classrooms (S1, S2, S3 and S4).

The project used a combination of HTML, CSS, PYTHON 3.2.8 AND DJANGO FRAMEWORK 3.10.0, SQLite, JavaScript, JQuery and Bootstrap to develop the system. The system was designed to be accessed by the system administrator and teachers, with the admin having full rights to the system, including registering students and teachers, entering marks and grading

The conclusion of the project methodology is that the SCHOOL GRADING SYSTEM has the potential to streamline the grading process, increase accuracy and efficiency, and provide a platform for analysis and improvement of the educational process at KYAMAKANDA SECONDARY SCHOOL. The system will provide the school with a modern, user-friendly, and efficient solution to manage the grading process.

In conclusion, the School Grading System is a significant contribution to the education sector in Uganda, and particularly Kyamakanda Secondary School. The system is designed to address the challenges faced by schools in adopting the new curriculum, and provides a platform for analysis and improvement of the educational process.

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CHAPTER ONE: INTRODUCTION

1.1. Introduction

The implementation of a school grading system is becoming increasingly important in Uganda, as schools seek to improve the accuracy and consistency of student performance data. This is especially true in the context of the new curriculum introduced by the National Curriculum Development Centre (NCDC), which places a greater emphasis on student assessment and evaluation.

Kyamakanda Secondary School, located in Rukungiri District, is one such school that is taking a proactive approach to addressing these challenges. With a student population of over 880 and a staff of 45 teachers, Kyamakanda Secondary School recognizes the need for a system that will streamline the grading process, improve data accuracy, and provide teachers and administrators with real-time access to student information.

Currently, the school relies on manual processes for school grading system, which are time-consuming and prone to errors. The proposed school grading system will automate these processes, ensuring that grades are recorded accurately and consistently. The system will also provide teachers with real-time access to student data, allowing them to track student progress and make informed decisions about their instructional practices.

In addition, the system will include features such as attendance tracking, making it easy for teachers and administrators to share information with the larger school community. The system will also integrate with existing systems and data sources, reducing the administrative burden on teachers and improving the overall efficiency of the school.

By implementing this system, Kyamakanda Secondary School aims to improve student outcomes, increase efficiency and productivity, and provide a foundation for data-driven decision-making. The school is confident that the implementation of this system will not only help to overcome the challenges faced by its faculty and staff, but also position the school as a leader in the use of technology in education in Uganda.

1.2. Background

The traditional manual process of school grading system involves teachers using physical/ paper form attendance and mark sheets to capture admission data of students in the school. Along with globalization and the development of the education industry, the process of school grading system has greatly changed. Recently, the National Curriculum Development Centre (NCDC) introduced a new curriculum, which places a greater emphasis on student assessment and evaluation. Despite the new curriculum, most schools in Uganda have not yet adopted automated school grading systems, making it difficult for teachers to accurately assess and report on student performance.

Recent studies have shown that manual grading processes in Ugandan schools result in an average accuracy rate of only 75%, leading to inaccuracies in student performance data. Additionally, limited access to information has made it difficult for teachers to track student progress in real-time and for administrators to make informed decisions about the school's programs and policies.

To address these challenges, KYAMAKANDA SECONDARY SCHOOL has proposed to implement an SCHOOL GRADING SYSTEM. The system will streamline the grading process, improve data accuracy and consistency, and provide teachers and administrators with real-time access to student data. The system will include features such as grading, attendance tracking, and student/parent portals, and will integrate with existing systems and data sources.

KYAMAKANDA SECONDARY SCHOOL believes that the implementation of the school grading system will not only help to overcome the challenges faced by its staff, but also position the school as a leader in the use of technology in education in Uganda. The school is confident that this system will be critical in successfully implementing the new NCDC curriculum and ensuring the success of its students.

1.3. Problem statement

In recent years, the Ministry of Education and Sports in Uganda has placed a greater emphasis on student assessment and evaluation as part of its efforts to improve the quality of education in the country. However, most schools in Uganda continue to rely on a manual system for school grading system, which are time-consuming, prone to errors, and limit teachers' ability to track student progress and make informed decisions about their instructional practices.

The Ministry of Education and Sports recognizes the importance of accurate and consistent student performance data for informed decision-making, both at the school and national level. However, the lack of adoption of automated school grading systems by most schools in Uganda presents a major barrier to achieving this goal.

In light of these challenges, KYAMAKANDA SECONDARY SCHOOL has proposed to implement an SCHOOL GRADING SYSTEM that will streamline the grading process, improve data accuracy, and provide teachers and administrators with real-time access to student data. This system will help to ensure that the school is able to meet the Ministry's goals and standards for student assessment and evaluation, while also providing a foundation for data-driven decision-making at the school level.

1.4. Objectives

1.4.1. General Objective

To develop an SCHOOL GRADING SYSTEM that will bring effectiveness and increase efficiency in student data management, grading for KYAMAKANDA SECONDARY SCHOOL.

1.4.2. Specific objectives

- To review literature for SCHOOL GRADING SYSTEM for KYAMAKANDA SECONDARY SCHOOL.
- To design a system for managing grading at KYAMAKANDA SECONDARY SCHOOL.

1.4.3. Research questions

- What are the best practices and key features of school grading systems that can be applied to Kyamakanda Secondary School?
- How can the school grading system be designed to effectively manage student data and grading at Kyamakanda Secondary School?
- What are the perceptions and experiences of teachers and administrators regarding the effectiveness and efficiency of the newly implemented school grading system at Kyamakanda Secondary School?

1.5. Significance of The Study.

Improving the quality of education: The implementation of a school grading system will improve the accuracy and consistency of student performance data, providing a more accurate

picture of student progress and enabling teachers to make informed decisions about their instructional practices. This will ultimately contribute to an improvement in the quality of education provided to students at Kyamakanda Secondary School.

Supporting the Ministry of Education and Sports' goals: The proposed school grading system is aligned with the Ministry of Education and Sports' goals and objectives for student assessment and evaluation. The system will provide data to support the Ministry's efforts to improve the quality of education in Uganda and ensure that schools are meeting the Ministry's standards for student assessment and evaluation.

Reducing administrative burden: By automating the grading process and integrating with existing systems and data sources, the school grading system will reduce the administrative burden on teachers and improve the overall efficiency of the school. This will free up teachers' time to focus on instruction and student engagement, and reduce the administrative workload associated with tracking student performance.

Improving data-driven decision-making: The real-time access to student performance data provided by the school grading system will enable teachers and administrators to track student progress and make informed decisions about their instructional practices. This will support data-driven decision-making at the school level and contribute to a culture of continuous improvement.

1.6. Project Scope.

1.6.1. Physical scope

The scope of this project is to develop and implement an SCHOOL GRADING SYSTEM for KYAMAKANDA SECONDARY SCHOOL in Rukungiri District, Uganda. The system will automate the grading process and provide real-time access to student performance data for teachers and administrators.

1.6.2. Technical scope

The system will use both software and hardware components and will be developed using PYTHON 3.2.8 AND DJANGO FRAMEWORK 3.10.0, HTML, JavaScript, CSS and the database will be developed using SQLite for their simplicity.

1.6.3. Time scope

To get all the information and to design a full running system will take 5 months that is from December 2023 to April 2024.

CHAPTER TWO: LITERATURE REVIEW

2.0. Introduction

The literature review provides a comprehensive overview of the existing research and knowledge in the field of school grading systems. It is intended to identify the key issues and challenges that schools face in managing student performance data, and to provide context for the proposed school grading system for Kyamakanda Secondary School. The review draws on a range of international sources, including books, academic journals, and conference proceedings, to provide a comprehensive overview of the current state of the field.

2.1. The State of the Current system

Over the years, the school grading system at KYAMAKANDA SECONDARY SCHOOL has been manual where by teachers do the grading on physical mark sheets and calculations using calculators. The entries are done manually using pens.

Generally, the current manual school grading system at KYAMAKANDA SECONDARY SCHOOL is manual and requires paperwork, physical presence, time of various stakeholders to be executed.

2.2. Key Issues and Challenges of the current system

The current school grading system within Kyamakanda Secondary School is a manual file based management system where students' records are kept in mark books. The system faces many limitations like prone to errors, separation and isolation of data, duplication of data, time consuming and expensive. When data is isolated in separate files, it is more difficult to access data that should be available (Thomas, 2011). Thomas reveals the following as some of the problems of manual information systems:

1. Paper based systems are generally very bulky both to handle and to store.
2. Information manual techniques of processing information are more boring, difficult, slow and inefficient.
3. Labor productivity is low and the process is slower where large volumes of data need to be dealt with.

The key issues and challenges that schools face in managing student performance data are related to the accuracy, security, and accessibility of the data (Wang et al., 2018). The manual processes used to manage this data are often time-consuming and prone to errors (Herbst & Walker, 2015), and there is a growing recognition of the need for more efficient and effective systems to manage this data (Wang et al., 2018). Additionally, the increasing use of technology in schools has raised concerns about the security and privacy of student information (Herbst & Walker, 2015), and there is a need for systems that can ensure the secure and confidential management of this data (NCES, 2017).

The management of student performance data is a critical component of the educational process, and it has become increasingly important in recent years with the introduction of new educational policies and standards (Herbst & Walker, 2015). Schools are required to maintain accurate and up-to-date records of student performance, and to provide regular reports to parents, teachers, and administrators (NCES, 2017). The manual processes used to manage this data are often time-consuming and prone to errors (Herbst & Walker, 2015), and there is growing recognition of the need for more efficient and effective systems to manage this data (Wang et al., 2018).

In recent years, there has been an increasing trend towards the use of electronic systems to manage student performance data in schools (Herbst & Walker, 2015). These systems are designed to automate the grading process and provide real-time access to student performance data for teachers and administrators (Wang et al., 2018). The benefits of these systems include increased accuracy and efficiency (Wang et al., 2018), improved data security and privacy (Herbst & Walker, 2015), (NCES, 2017). However, there are also challenges associated with the implementation of these systems, including the need for teacher training (Herbst & Walker, 2015), the integration with existing systems and data sources (Wang et al., 2018), and the ongoing maintenance and support of the systems (NCES, 2017).

2.3. Proposed system

SCHOOL GRADING SYSTEM will have two actors who will interact with application. Firstly, teachers who will insert student bio and academic data. However, admin will distribute user accounts for each teacher to allow them access to the system and their privileges less than the admin. Teachers can also view profiles of students.

Lastly, system will be developed based on Software Development Life Cycle (SDLC) with PYTHON 3.2.8 AND DJANGO FRAMEWORK 3.10.0 and SQLite server. PYTHON 3.2.8 AND DJANGO FRAMEWORK 3.10.0 is good for the development and design of web-based programs whiles SQLite is good for databases because it is secure and has advanced features and properties. HTML, Bootstrap and CSS will also be used to design the interface of the user to understand. JavaScript is to be used as well to implement scripts. Apache Web server is to be used in this case to make the system available on the school network.

2.4. Conclusion

The literature review provides a comprehensive overview of the existing research and knowledge in the field of school grading systems. It highlights the key issues and challenges that schools face in managing student performance data, and provides context for the proposed school grading system for Kyamakanda Secondary School. The literature review demonstrates the need for more efficient and effective systems to manage student performance data (Wang et al., 2018), and underscores the importance of ensuring the accuracy, security, and accessibility of this data (Herbst & Walker, 2015).

CHAPTER 3: PROJECT METHODOLOGY

3.1 Introduction

The chapter deals with methods of data collection that will be used in the system research study and design of the proposed system. An investigation of the current manual system will be carried out in order to determine the requirement and specifications for the SCHOOL GRADING SYSTEM. The process of data collection involves identifying all the major activities and selective observation/ investigation to choose what activities should be considered for the development of the system. During the fact-finding process, the researcher will use different techniques like observation, Interviewing, document review and questionnaires to learn more about the existing system.

3.2. Research Design

The research design for this study will be a qualitative case study design, which will involve the examination of the Kyamakanda Secondary School's grading system and the challenges faced by the school in implementing the new curriculum introduced by the National Curriculum Development Centre (NCDC). This design was chosen because it allows for in-depth exploration and understanding of the school's current school grading system, as well as the potential solutions to improve the system.

3.2.1 Target Population

The target population for this study will be teachers, students, and management at the KYAMAKANDA SECONDARY SCHOOL. A sample of this population will be selected from these about 1000 people for the data collection phase through convenient sampling.

3.2.2. Sampling.

A sample is an element of the population considered for actual inclusion in the study, or it is a subset of measurements drawn from a population we are interested in. therefore sampling can be defined as selecting or choosing a small portion of the total set of objects, events, persons, which together comprise the subjects of the study.

3.2.3. Sampling techniques.

Stratified sampling together with purposive sampling methods was used as the major sampling techniques, grouping population into different strata. The population sample is divided into

distinct. Independent strata that can enable the researchers to draw inferences about specific subgroups like school staff both teaching and non-teaching, students and others.

Strata	Total number of people in strata
School teaching staff	50
Non-teaching staff	20
Students	500
Others	80
Total	700

Table 1 showing the different strata and number in the strata

3.2.4. Sample Size.

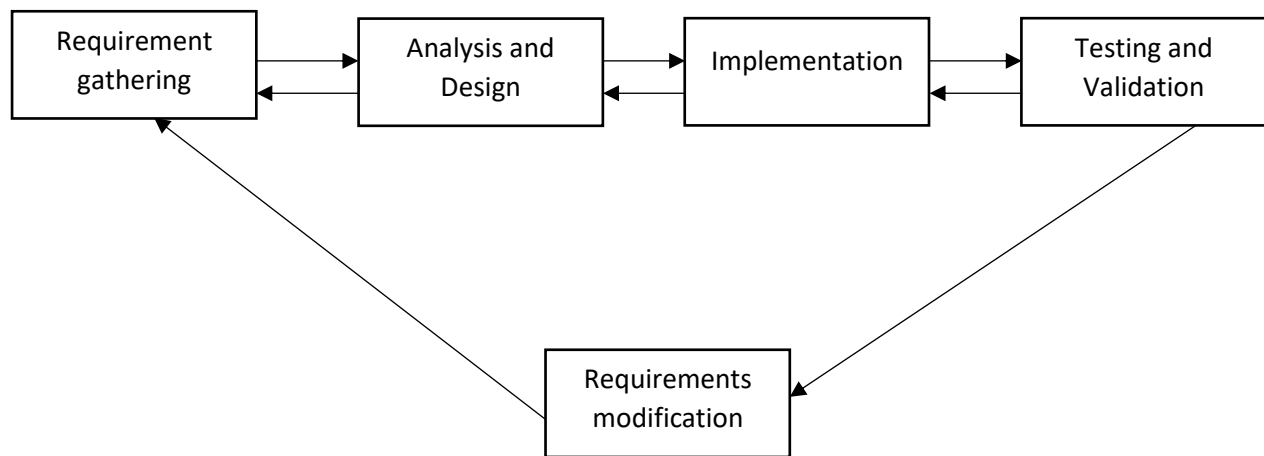
This research project basing on Kyamakanda Secondary school therefore from each category the researcher took a stratum population and used it to get some information about the manual system implemented one using research tools. The researcher took 10% of every strata and used it to get responses. (**sample size of strata = 10% * strata**)

Strata	Total number of people in strata	Sample size(10% strata)
School teaching staff	50	$(0.1*50) = 5$
Non-teaching staff	20	$(0.1*20) = 2$
students	500	$(0.1*500) = 50$
Others	80	$(0.1*80) = 8$
Total	700	65

Table 2 showing sample size

3.3. System Development Methodology

The SCHOOL GRADING SYSTEM for KYAMAKANDA SECONDARY SCHOOL will be developed using a software development life cycle (SDLC) approach, which includes the following phases:



- **Requirements gathering:** Data will be gathered through document review, interviews, and surveys to determine the requirements of the new school grading system.
- **System analysis and design:** Based on the data gathered in the requirements gathering phase, the system will be analyzed and designed to meet the needs of the school.
- **Development and testing:** The school grading system will be developed and tested to ensure that it meets the requirements and functions as intended.
- **Deployment:** The school grading system will be deployed to the Kyamakanda Secondary School and used for grading purposes.
- **Maintenance and support:** The system will be maintained and supported to ensure its continued functionality and to address any issues that arise.

3.3.1. Data Collection Techniques

The data for this study will be collected using a combination of methods including:

Document review: In this technique, the researcher will analyze publications of experts and previous studies about various SCHOOL GRADING SYSTEMS like SCHOOL journals and books to review literature on related systems. Having analyzed the existing school grading system and reviewed literature on related systems, the researcher will be able to stimulate the new system's requirements

I will use it because of its advantages, which include;

- It is not expensive because the data is already there
- It permits examination of trends over the past
- It doesn't interrupt program or client's routine in program
- There are few biases about information

Interviewing method: The researcher will carry one-on-one directed conversation with key users and stakeholders of the existing system among which included the administrators and bus conductors, and some clients to find out how they have been coping with the existing system, what difficulties encountered with the existing system and their expectations or suggestions for the new system. I will use this technique because;

- It gives accurate information on what you are researching.
- The researcher is able to ask all the questions and gets all the answers at that moment, since there is direct contact.
- It allows the researcher to get more information through probing and observing nonverbal messages.

3.3.2 System Requirements

Hardware Resources:

- A computer or laptop with internet access for the system administrator.
- A computer or laptop with internet access for each teacher.

Software Resources:

- Web Server (Apache)
- PYTHON 3.2.8 AND DJANGO FRAMEWORK 3.10.0 or higher
- SQLite database
- HTML5, CSS3, JavaScript

3.7. Logical System Design

User Authentication:

- The system will have three types of users: administrators and teachers.
- The administrator will have the highest level of access to the system and will be responsible for registering students and teachers, grading students.
- Teachers will be responsible for entering student marks into the system.
- Management will be responsible for approving the grades entered by the teachers.

Student and Teacher Registration:

- The administrator will use a form to register new students and teachers in the system.
- The form will collect information such as name, date of birth, class, and subject taught (for teachers).
- The administrator will also assign a unique username and password for each registered user.

Grading:

- Teachers will enter marks for each student in each subject.
- The system will automatically calculate the student's average identifier for each subject.
- The administrator will use the system to assign final grades for each student based on the identifiers and averages.
- Management will review and approve the final grades.

Data Management:

- The system will use a database (SQLite) to store all student and teacher information.
- The database will be secured with appropriate measures to protect sensitive information by a root password that only the administrator knows.
- The system will also have backup and recovery procedures to ensure data integrity in case of system failure or other issues.

3.9. Database design.

To design a database for the school grading system, you can start by identifying the entities or objects that will be stored in the database and their relationships. For this particular system, the entities will include: Students, Teachers, Classes (S1, S2, S3 and S4), Grades among others

The relationships between these entities can be: Each student belongs to one class, each teacher teaches one or more classes, each class has one or more students and one or more teachers, each grade belongs to one student and one class among others.

Based on these entities and relationships, I'll create a database schema with tables for each entity and columns that represent the attributes of each entity. For example, the students table can have columns for student ID, first name, last name, guardian, home location, class ID, etc. The grades table can have columns for grade ID, student ID, class ID, marks, etc.

Once the schema is complete, will use SQL commands to create the tables and relationships in a relational database management system in this case is SQLite.

3.9.1. Implementation Techniques

This will be focused on the details of implementation including the programming environment, data structures and the language to be used, whereby BOOTSTRAP, HTML, PYTHON 3.2.8 AND DJANGO FRAMEWORK 3.10.0, CSS, JQUERY, and SQLite will be used to develop the system because of the following reasons;

Bootstrap; Bootstrap is an open source toolkit for developing with HTML, CSS, and JS. Quickly prototype your ideas or build your entire app with our Sass variables and mix ins, responsive grid system, extensive prebuilt components, and powerful plugins built on jQuery.

Bootstrap is the third-most-starred project on GitHub, with more than 131,000 stars, behind only freeCodeCamp (almost 300,000 stars) and marginally behind Vue.js framework. According to Alexa Rank, Bootstrap getbootstrap.com is in the top-2000 in US while vuejs.org is in top-7000 in US.

Hypertext Mark-up Language; Hypertext Mark-up Language (HTML) is a popular mark-up language used in web pages. HTML, can be simply written in a text editor and tested through web browser. Writing in html is easy; with html, it is also possible to add media and images to the web page. HTML contains special mark-up tags like <title>, <h>, <p> etc. To declare the title of the page for example, the title has to be included in the title tags. Similarly, the paragraphs, headings and other different contents in website pages have to be included inside the respective HTML tags. It is easy to store HTML code; in a simple text file with filename followed by .html or .htm extension. HTML gives developers the possibility of creating sections in the document. As <title>

tag gives the title for the web page, <H1> for example specifies the main content of the web page. Similarly, with H2, H3 and so on tags, HTML creates minor contents. There are tags for other features such as paragraphs (<p>), style of font (bold) and tables (<table>) etc.

JQuery; JavaScript library designed to simplify HTMLDOM tree traversal and manipulation, as well as event handling, CSS animation, and Ajax. It is free, open-source software using the permissive MIT License. Web analysis (from 2017) indicates that it is the most widely deployed JavaScript library by a large margin.

JQuery's syntax is designed to make it easier to navigate a document, select DOM elements, create animations, handle events, and develop Ajax applications. JQuery also provides capabilities for developers to create plug-ins on top of the JavaScript library. This enables developers to create abstractions for low-level interaction and animation, advanced effects and high-level, theme able widgets. The modular approach to the jQuery library allows the creation of powerful dynamic web pages and Web applications.

JavaScript; JavaScript is one of the most popular script languages for webpages today. JavaScript (JS) is an object-oriented language that supports features such as imperative and functional programming. The syntax is similar to other object-oriented languages such as Java and C++, hence making it easy to learn for people who know these languages. JS is used to add interactive features such as buttons,

Cascading Style Sheet (CSS); Is a language that was developed in 1992-1993. CSS helps design each element of the mark-up elements language such as HTML by giving complete control to the designer. While the HTML elements enables the web page designers to add what content they want, CSS makes it possible how to display the content to the user. CSS covers the areas such as colors, layout, advanced positions of elements, fonts and allows the content to adapt the content to different devices such as phones, tablets, bigger screens and printers. CSS can operate independently as well as be used with any mark-up languages based in XML. CSS uses simple, everyday English words and has an easy syntax. CSS is crucial in advanced web designing as it gives control to the layout and offers numerous techniques to make the web page look sophisticated. Currently, all main browsers such as Internet Explorer, Safari, Opera, Chrome and Firefox support the basic features of CSS. (UKOLN 2006.) CSS has been used in the web pages

for the development of sample SCHOOL booking system for this thesis for positioning, layout, margins and colours for the HTML elements.

SQLite Database; Databases are collections of similar data. Databases are used for organized collection and storing of similar data, to be later used for specific purposes. A database contains tables with rows and columns populated with objects, which displays connection between them. A database acts as a shared resource for the programs, which can use the information from the database. Many enterprises rely on databases today to store a wide range of information systematically. Databases are used almost everywhere: in small companies, which can use database to save customers' information, and for more advanced scientific and military areas. Databases facilitate the task of searching hundreds and thousands of records much simpler by storing them in an organized manner. Among many database programs available today, SQLite Database is to be used in the development work for this thesis

3.9.2. Testing and Validation.

The testing and validation procedure for the school grading system would involve several steps to ensure the system meets the requirements and works as intended.

- **Unit Testing:** This involves testing each component of the system individually to ensure it works as expected. For example, testing the user registration and authentication, teacher's mark input and management's approval.
- **Integration Testing:** This involves testing how well the different components of the system work together. This would test the integration between the front-end and back-end, database and user interface, etc.
- **System Testing:** This involves testing the entire system to ensure it works as a whole and meets the requirements specified. This would test the functionality, performance, and usability of the system.
- **User Acceptance Testing:** This involves having real users test the system to ensure it meets their expectations and requirements. This would involve teachers, management, and admin of Kyamakanda Secondary School.
- **Security Testing:** This involves testing the system's security features such as password protection, data encryption, etc. to ensure the system is secure and protects sensitive data.

Finally, the system would be validated through a formal review process involving stakeholders such as the Ministry of Education and Sports and the National Curriculum Development Centre (NCDC) to ensure it meets the standards and regulations set by these organizations.

3.9.3. Future Work

The future work provisions section outlines potential future developments and improvements for the school Grading System for Kyamakanda Secondary School. Some potential additions could include:

- **Integration with other school management systems**, such as student and staff management systems, to improve efficiency and reduce manual data entry.
- **Development of a mobile application**, which allows teachers and administrators to access the system on-the-go and update records as necessary.
- **Implementation of machine learning algorithms** to help with grade predictions and to provide insights into student performance trends.
- **Expansion of the system** to support additional subjects and to be used by other classrooms within the school or other schools in the district.
- **Improving the system's security features** to ensure the confidentiality and integrity of student data.

By including these provisions, the school Grading System for Kyamakanda Secondary School can be continuously developed and improved to better serve the needs of the school and its students.

3.9.4. CONCLUSION

In conclusion, the school grading system for Kyamakanda Secondary School in Rukungiri District is designed to address the issue of the new curriculum by NCDC and the need for schools to adopt a grading management system. The proposed system was designed using HTML, CSS, PYTHON 3.2.8 AND DJANGO FRAMEWORK 3.10.0, SQL, JavaScript, JQuery, Bootstrap to meet the system requirements. The project methodology involved research design, data collection techniques, system methodology, document review, target population, and testing and validation procedures. The logical system design was based on the access of the system by admin, staff and management with the admin having full control over the system. The database design and flow chart were formulated to ensure that the system works efficiently. The testing and validation

procedures were put in place to ensure that the system meets the set objectives. Finally, the conclusion highlights the importance of the school grading system and the future work provisions that need to be put in place to continuously improve the system.

CHAPTER 4: DATA ANALYSIS, PRESENTATION AND INTERPRETATION OF FINDINGS.

4.1 Introduction

This chapter serves as a critical component of this research, providing a comprehensive and systematic examination of collected data. This chapter plays a pivotal role in extracting meaningful insights, identifying patterns, and drawing conclusions from the gathered information. By employing various analytical techniques and statistical methods, researchers can explore relationships, test hypotheses, and derive valuable findings, thereby contributing to the overall objectives and knowledge advancement of the research project.

4.2.1 Data Analysis

Gender Distribution: Out of the 65 respondents, 40 were male, and the remaining were female.

Gender	Count	Percentage
Male	40	61.54%
Female	25	38.46%

- **Mean:** The mean gender distribution is calculated by dividing the count of males by the total number of respondents:

$$\begin{aligned}\text{Mean} &= (\text{Number of Males} / \text{Total Respondents}) * 100 \\ &= (40 / 65) * 100 \\ &\approx \underline{\underline{61.54\%}}\end{aligned}$$

- **Median:** Since we have an odd number of respondents, the median is 50% for both males and females.

Age Distribution: Among the respondents, 15 were above 18 years old, while the rest were below this age.

Age Group	Count	Percentage
Above 18 years	15	23.08%
Below 18 years	50	76.92%

Acceptance Rate: Out of the 65 respondents, 50 accepted to participate in the research project, while the remaining respondents declined.

Acceptance by age

	Acceptance	Denial
Above 18 years	10	5
Below 18 years	40	10

Acceptance by Gender.

	Acceptance	Denial
Male	30	10
Female	20	5

CHAPTER 5: DISCUSSION OF FINDINGS, CONCLUSIONS AND RECOMMENDATION

5.1 Discussion of findings

Gender Distribution: Out of the 65 respondents, 61.54% were male, while the remaining 38.46% were female. The mean gender distribution indicates that males constituted the majority of the sample, with a percentage of approximately 61.54%. The median distribution reveals an equal gender split, with 50% of the respondents being males and 50% being females. This suggests that the sample had a slightly higher representation of males compared to females.

Age Distribution: Among the respondents, 23.08% were above 18 years old, while the remaining 76.92% were below 18 years old. This indicates that a larger proportion of the sample consisted of individuals below the age of 18. However, without additional context or comparison to the population's age distribution, it is challenging to draw further conclusions from this information alone.

Acceptance Rate: Out of the 65 respondents, 76.92% accepted to participate in the research project, while the remaining 23.08% declined. This suggests a relatively high acceptance rate within the sample, with the majority of participants agreeing to be part of the research project. The acceptance rate can provide insights into the willingness of individuals to engage in the study, but it would be beneficial to compare this rate to similar research or establish a baseline for a more comprehensive analysis.

Acceptance by Age and Gender: Unfortunately, the data analysis findings do not provide specific details about acceptance rates by age or gender. To further explore the relationship between acceptance and age or gender, we would need the observed frequencies for acceptance and denial within each category. This information would allow us to conduct a comprehensive analysis, such as chi-square tests, to determine if there are any significant associations between acceptance and age or gender.

In conclusion, the initial data analysis provides an overview of the gender distribution, age distribution, and acceptance rate within the sample.

5.2 Conclusion

In conclusion, the SCHOOL GRADING SYSTEM has the potential to revolutionize the grading process at Kyamakanda Secondary School. The system provides a modern, user-friendly, and efficient solution to manage the school grading process, and will help to address the challenges faced by schools in adopting the new curriculum. The successful implementation of the system will not only improve the quality of education at the school, but also serve as a model for other schools in Uganda looking to improve their grading processes.

5.3 Recommendations;

- The SCHOOL GRADING SYSTEM should be integrated with the school's existing IT infrastructure to ensure seamless operation and minimize downtime.
- The school administration should provide adequate training and support to teachers and staff members to ensure effective utilization of the system.
- The system should be periodically updated and maintained to ensure its continued functionality and effectiveness.
- The school should consider expanding the system to cover all classes and subjects, in order to maximize its benefits.

CHAPTER 6: ARTIFACT DESIGN AND IMPLEMENTATION

6.1 System Design

INPUT DESIGN

Input design is the process of converting user-oriented input to a computer based format. Input design is a part of overall system design, which requires very careful attention. Often the collection of input data is the most expensive part of the system. The main objectives of the input design are ...

1. Produce cost effective method of input
2. Achieve highest possible level of accuracy
3. Ensure that the input is acceptable to and understood by the staff.

Input Data

The goal of designing input data is to make entry easy, logical and free from errors as possible. The entering data entry operators need to know the allocated space for each field; field sequence and which must match with that in the source document. The format in which the data fields are entered should be given in the input form. Here data entry is SCHOOL; it makes use of processor that accepts commands and data from the operator through a key board. The input required is analyzed by the processor. It is then accepted or rejected. Input stages include the following processes

- Data Recording
- Data Transcription
- Data Conversion
- Data Verification
- Data Control
- Data Transmission
- Data Correction

One of the aims of the system analyst must be to select data capture method and devices, which reduce the number of stages so as to reduce both the changes of errors and the cost. Input types, can be characterized as.

- External
- Internal
- Operational
- Computerized
- Interactive

Input files can exist in document form before being input to the computer. Input design is rather complex since it involves procedures for capturing data as well as inputting it to the computer.

OUTPUT DESIGN

Outputs from computer systems are required primarily to communicate the results of processing to users. They are also used to provide a permanent copy of these result for latter consultation. Computer output is the most important and direct source of information to the users. Designing computer output should proceed in an organized well throughout the manner. The right output must be available for the people who find the system easy for use. The outputs have been defined during the logical design stage. If not, they should have defined at the beginning of the output designing terms of types of output connect, format, response etc.

Various types of outputs are

- External outputs
- Internal outputs
- Operational outputs
- Interactive outputs
- Turn around outputs

All screens are informative and interactive in such a way that the user can full fill his requirements through asking queries.

DATABASE DESIGN

The general theme behind a database is to handle information as an integrated whole. A database is a collection of interrelated data stored with minimum redundancy to serve many users quickly and effectively. After designing input and output, the analyst must concentrate on database design or how data should be organized around user requirements. The general objective is to make

information access, easy quick, inexpensive and flexible for other users. During database design the following objectives are concerned:

- Controlled Redundancy
- Data independence
- Accurate and integrating
- More information at low cost
- Recovery from failure
- Privacy and security
- Performance
- Ease of learning and use

Figure i System structure

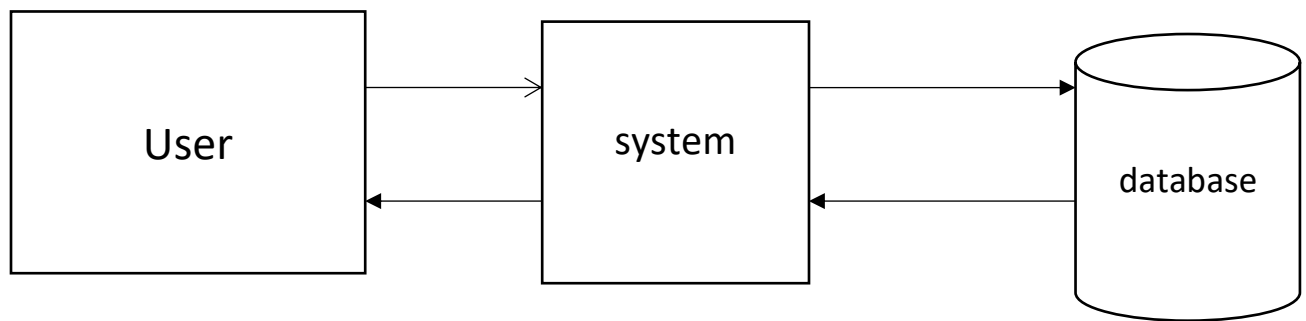
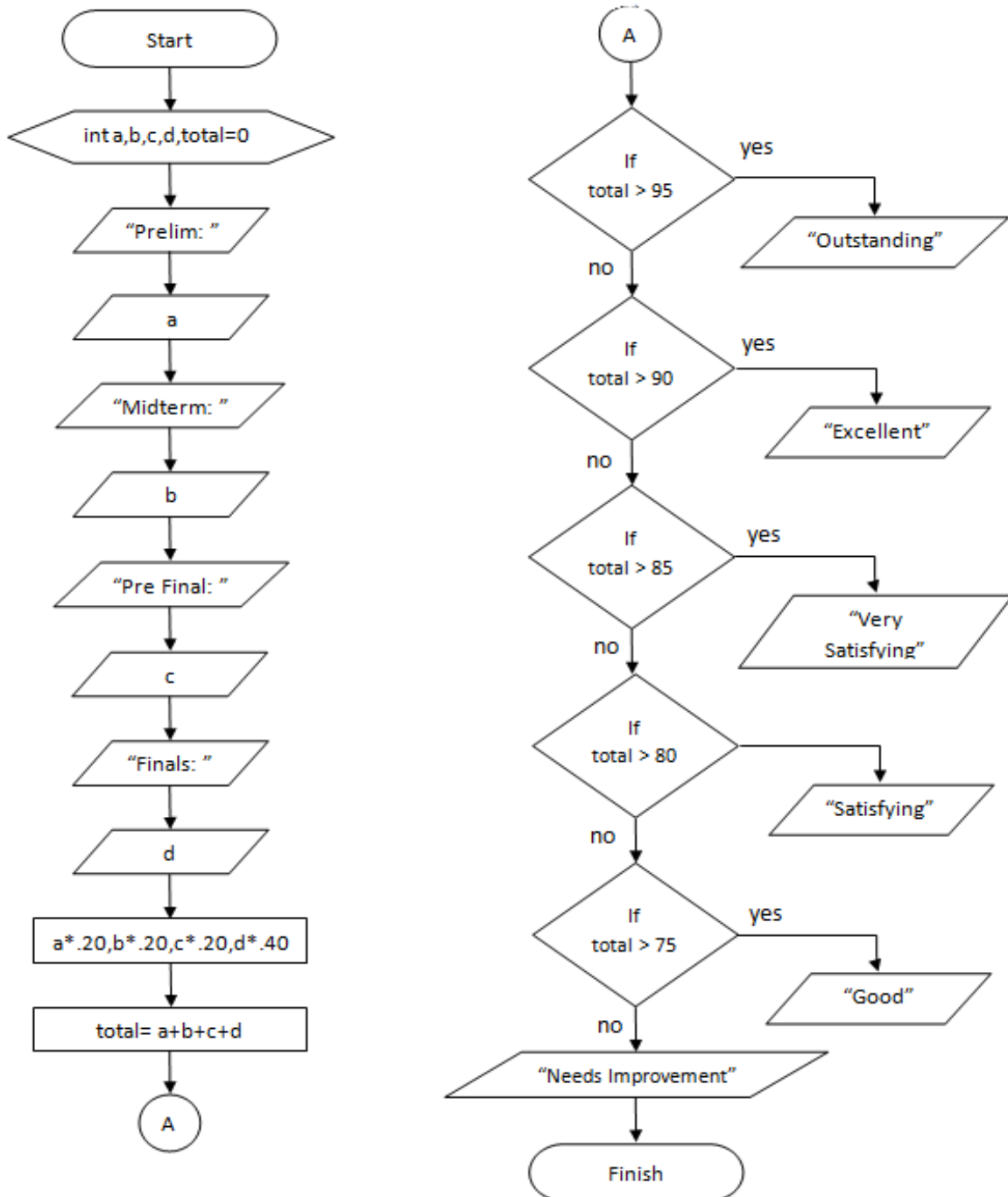


Figure ii showing ER diagram

Figure iii showing Flow chart



6.2 System Implementation

In this part of research, we translate theoretical concepts into practical solutions. It involves addressing technical challenges, collaborating with interdisciplinary teams, and validating research findings. By considering feasibility, ethics, and documenting the process, we ensure successful execution and real-world impact.

6.2.1. System interface

Figure iv showing Login that accommodates all three users.

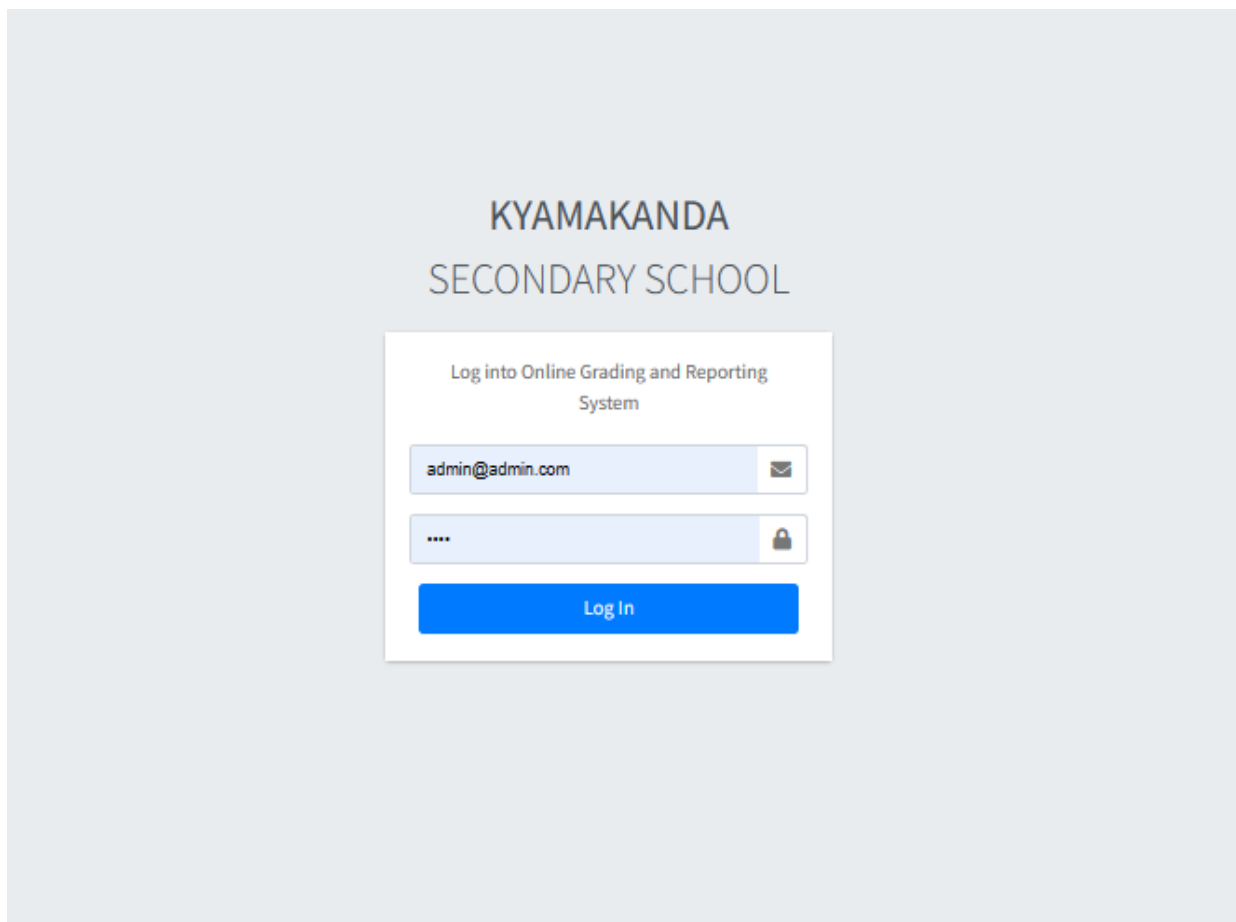


Figure v showing the Admin/HOD dashboard

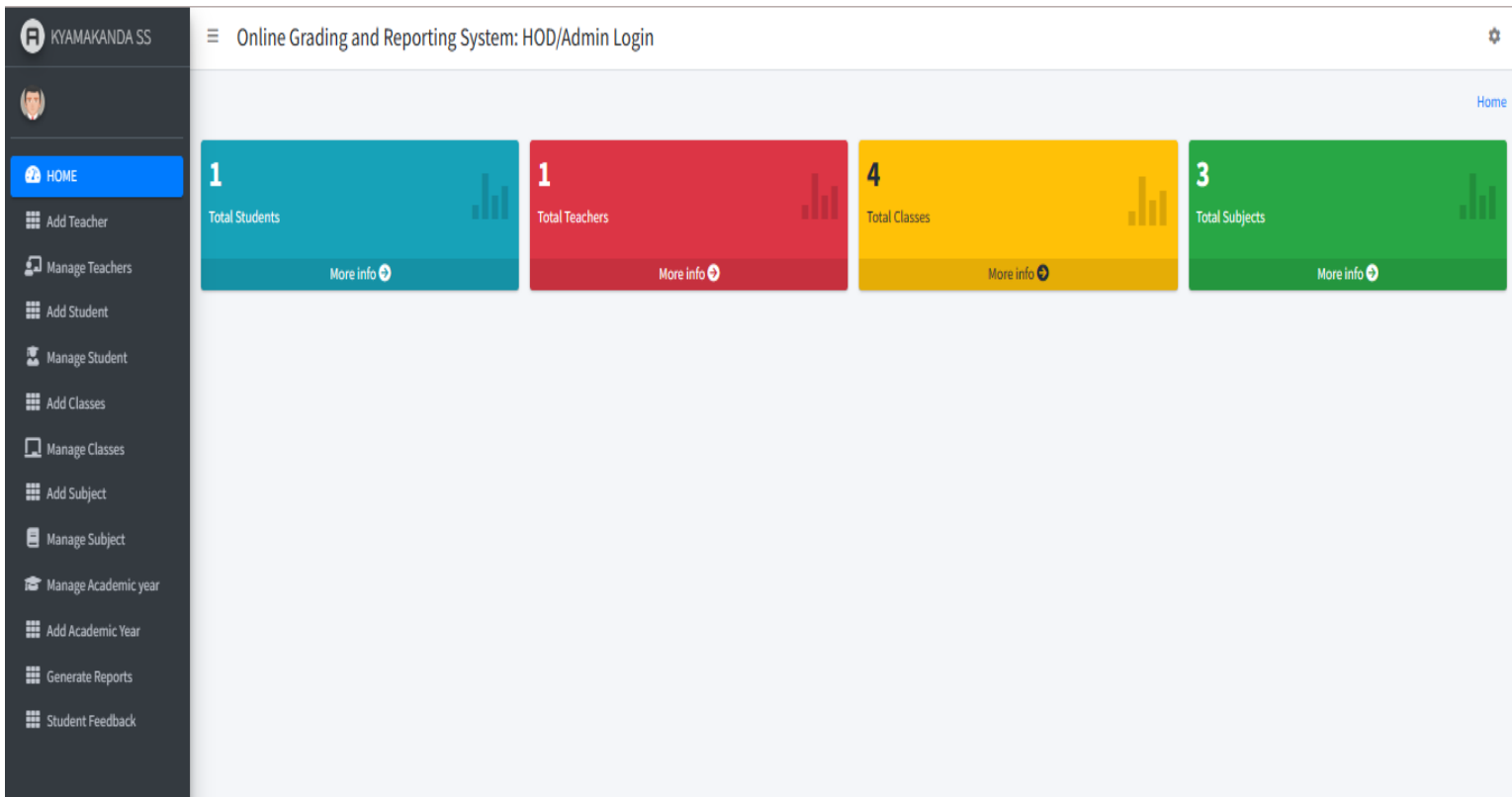


Figure vi showing Teacher's dashboard

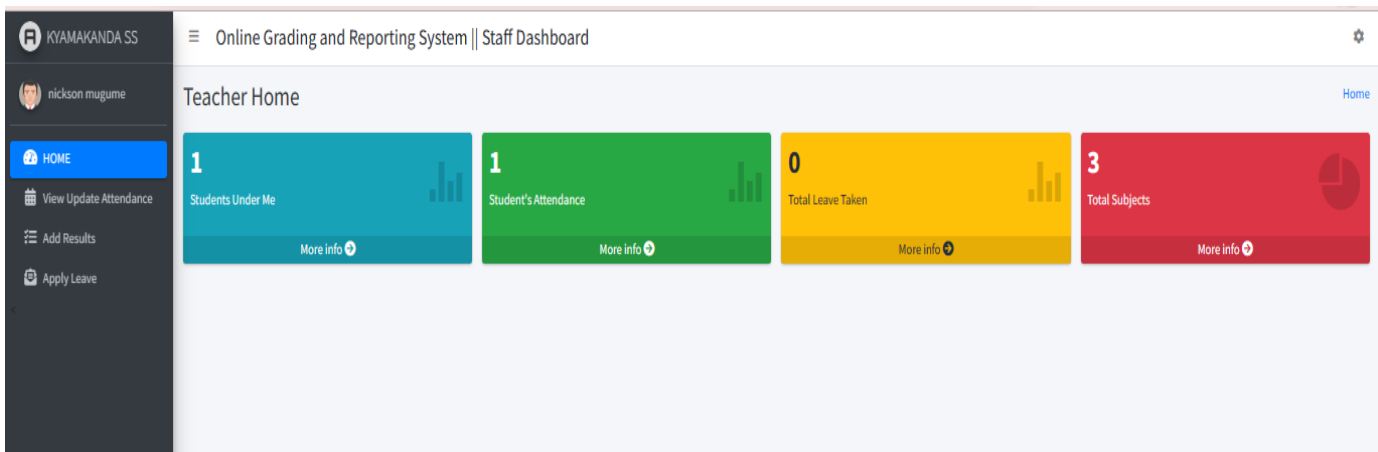


Figure vii showing Student Dashboard

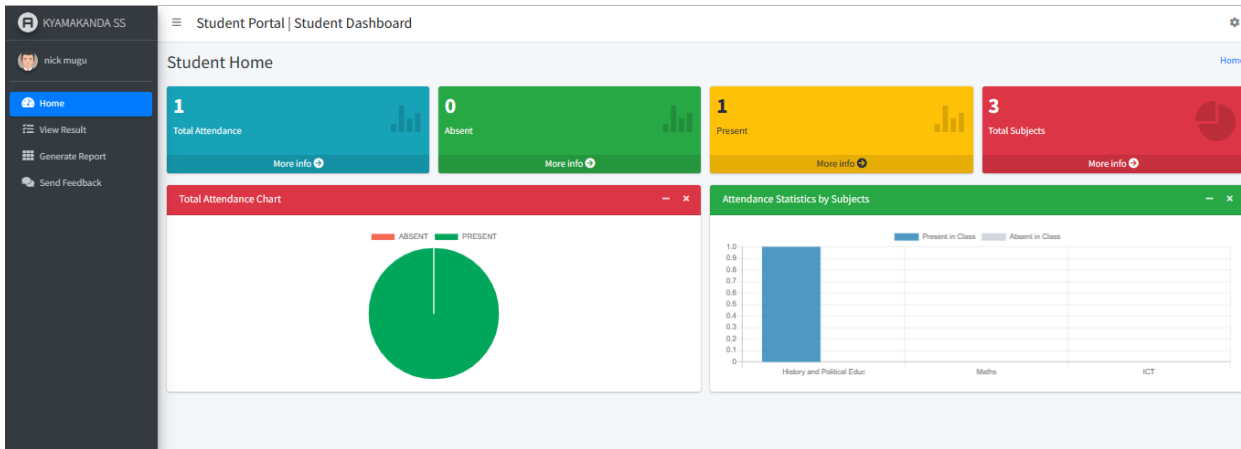


Figure viii showing Student's marks view

Student Portal | Student Dashboard

Results

#ID	Subject	CW 1 Of 10	CW 2 Of 10	CW 3 Of 10	Total CW	CW identifier	EOT/80	Final Grade	Comment
1	History and Political Educ	9.0	9.0	9.0	0.0	0.0	70.0	0.0	
2	Maths	10.0	10.0	10.0	0.0	0.0	80.0	0.0	
3	ICT	9.0	9.0	9.0	20.0	3.0	80.0	3.0	Outstanding

Figure ix showing Updating student profile

Student Portal | Student Dashboard ⚙️

Update Profile [Home](#)

Update Profile

Username

Email

First Name

Last Name

Address

Password

Update Profile

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Figure x showing Adding a new teacher

☰ Online Grading and Reporting System: HOD/Admin Login ⚙

Add Teacher [Home](#)

Add Teacher

Email address

Username

Password

First Name

Last Name

Address

Figure xi showing Managing teacher in Admin

Online Grading and Reporting System: HOD/Admin Login

Manage Teacher

[Home](#)

[+ Add Teacher](#)

Teacher Details

ID	First Name	Last Name	Username	Email	Address	Last Login	Date Joined	Action
2	nickson	mugume	teacher1@teacher.com	teacher1@teacher.com	kabale	May 5, 2023, 8:08 a.m.	May 4, 2023, 5:53 p.m.	Edit Delete

Figure xii showing Admin Add Student

Online Grading and Reporting System: HOD/Admin Login

Add Student

[Home](#)

Add Student

Email:

Password:

First Name:

Last Name:

Username:

Address:

Course:

Gender:

Session Year:

Profile Pic:

Figure xiii showing Managing student in Admin

Online Grading and Reporting System: HOD/Admin Login ⚙

Manage Student Home

[+ Add Student](#)

Student Details Search 🔍


ID	First Name	Last Name	Username	Email	Address	Gender	Profile Pic	Start Year	End Year	Course	Last Login	Date Joined	Action
3	nick	mugu	student1@student.com	student1@student.com	Rukungiri	Male		Jan. 4, 2023	Dec. 4, 2023	S1	May 5, 2023, 8:08 a.m.	May 4, 2023, 5:55 p.m.	Edit Delete

Figure xiv showing Managing classrooms in Admin

Online Grading and Reporting System: HOD/Admin Login ⚙

Manage Classroom Home

[+ Add Classroom](#)

Class Details Search 🔍

ID	Class	Created At	Updated At	Action
1	S1	May 4, 2023, 5:52 p.m.	May 4, 2023, 5:52 p.m.	Edit Delete
2	S2	May 4, 2023, 5:52 p.m.	May 4, 2023, 5:52 p.m.	Edit Delete
3	S3	May 4, 2023, 5:52 p.m.	May 4, 2023, 5:52 p.m.	Edit Delete
4	S4	May 4, 2023, 5:52 p.m.	May 4, 2023, 5:52 p.m.	Edit Delete

Figure xv showing Adding Subject in admin

Online Grading and Reporting System: HOD/Admin Login ⚙

Add Subject Home

Add Subject

Subject Name

Class

Teacher

Figure xvi showing Managing Subjects in Admin

Online Grading and Reporting System: HOD/Admin Login ⚙️

Manage Subjects Home

[+ Add Subject](#)

Subject Details Search 🔍

ID	Subject Name	Course	Teacher	Created At	Updated At	Action
1	History and Political Educ	S1	nickson mugume	May 4, 2023, 5:53 p.m.	May 4, 2023, 5:53 p.m.	Edit Delete
2	Maths	S1	nickson mugume	May 4, 2023, 5:53 p.m.	May 4, 2023, 5:53 p.m.	Edit Delete
3	ICT	S1	nickson mugume	May 4, 2023, 5:53 p.m.	May 4, 2023, 5:53 p.m.	Edit Delete

Figure xvii showing Academic year page

Online Grading and Reporting System: HOD/Admin Login ⚙️

Add Academic Year Home

[Add Academic Year](#)

Academic Year start
 📅

Academic Year ends
 📅

[Add Academic Year](#)

Figure xviii showing Adding Results on Teacher page

Add Results

[Home](#)

Add Results

Subject

Academic Year

[Fetch Student](#)

Student List

Assignment1 Marks :	Assignment2 Marks :
<input type="text" value="Assignment1 Marks"/>	<input type="text" value="Assignment2 Marks"/>
Assignment3 Marks :	Exam Marks :
<input type="text" value="Assignment3 Marks"/>	<input type="text" value="Exam Marks"/>

[Save Result](#)

6.3 Validation/Evaluation

Testing and Validation.

The testing and validation procedure for the school grading system would involve several steps to ensure the system meets the requirements and works as intended.

- **Unit Testing:** This involves testing each component of the system individually to ensure it works as expected. For example, testing the user registration and authentication, teacher’s mark input and management’s approval.
- **Integration Testing:** This involves testing how well the different components of the system work together. This would test the integration between the front-end and back-end, database and user interface, etc.
- **System Testing:** This involves testing the entire system to ensure it works as a whole and meets the requirements specified. This would test the functionality, performance, and usability of the system.

- **User Acceptance Testing:** This involves having real users test the system to ensure it meets their expectations and requirements. This would involve teachers, management, and admin of Kyamakanda Secondary School.
- **Security Testing:** This involves testing the system's security features such as password protection, data encryption, etc. to ensure the system is secure and protects sensitive data.

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APPENDIX
WORKPLAN

PHASE	DESCRIPTION	DURATION (WEEKS)	PERIOD	EXPECTED OUTCOME
1	<u>Planning</u> Problem Identification. Analyzing the feasibility	2.5	December 2022	Feasibility study
2	<u>Report writing</u> Literature review and writing all sections.	3	December 2022	Report writing
3	<u>Preliminary analysis</u> Identification of the system requirements.	3	January 2023	Requirements done.
4	<u>System design</u> Physical system interface programs	9	January- March 2023	Designing the system
5	<u>Analysis and system design</u> Software testing and Evaluation	2	April 2023	Testing the system
6	<u>Report writing</u> Writing detailed account of the project.	1	April 2023	Report writing
7	<u>Project presentation</u>	1	April 2023	Project presentation

Sample codes

```
from django.contrib.auth.models import AbstractUser
from django.db import models
from django.db.models.signals import post_save
from django.dispatch import receiver

class SessionYearModel(models.Model):
    id = models.AutoField(primary_key=True)
    session_start_year = models.DateField()
    session_end_year = models.DateField()
    objects = models.Manager()

# Overriding the Default Django Auth User and adding One More Field (usertype)
class CustomUser(AbstractUser):
    user_type_data = ((1, "HOD"), (2, "Staff"), (3, "Student"))
    user_type = models.CharField(default=1, choices=user_type_data, max_length=10)

class AdminHOD(models.Model):
    id = models.AutoField(primary_key=True)
    admin = models.OneToOneField(CustomUser, on_delete = models.CASCADE)
    created_at = models.DateTimeField(auto_now_add=True)
    updated_at = models.DateTimeField(auto_now=True)
    objects = models.Manager()

class Staffs(models.Model):
    id = models.AutoField(primary_key=True)
```

```
admin = models.OneToOneField(CustomUser, on_delete = models.CASCADE)
address = models.TextField()
created_at = models.DateTimeField(auto_now_add=True)
updated_at = models.DateTimeField(auto_now=True)
objects = models.Manager()
```

```
class Courses(models.Model):
```

```
    id = models.AutoField(primary_key=True)
    course_name = models.CharField(max_length=255)
    created_at = models.DateTimeField(auto_now_add=True)
    updated_at = models.DateTimeField(auto_now=True)
    objects = models.Manager()
```

```
    # def __str__(self):
    #     return self.course_name
```

```
class Subjects(models.Model):
```

```
    id =models.AutoField(primary_key=True)
    subject_name = models.CharField(max_length=255)
    course_id = models.ForeignKey(Courses, on_delete=models.CASCADE, default=1) #need to
give default course
    staff_id = models.ForeignKey(CustomUser, on_delete=models.CASCADE)
    created_at = models.DateTimeField(auto_now_add=True)
    updated_at = models.DateTimeField(auto_now=True)
    objects = models.Manager()
```

```
class Students(models.Model):
```

```
    id = models.AutoField(primary_key=True)
    admin = models.OneToOneField(CustomUser, on_delete = models.CASCADE)
```

```
gender = models.CharField(max_length=50)
profile_pic = models.FileField()
address = models.TextField()
course_id = models.ForeignKey(Courses, on_delete=models.DO_NOTHING, default=1)
session_year_id = models.ForeignKey(SessionYearModel, on_delete=models.CASCADE)
created_at = models.DateTimeField(auto_now_add=True)
updated_at = models.DateTimeField(auto_now=True)
objects = models.Manager()
```

```
class Attendance(models.Model):
```

```
    # Subject Attendance
```

```
    id = models.AutoField(primary_key=True)
    subject_id = models.ForeignKey(Subjects, on_delete=models.DO_NOTHING)
    attendance_date = models.DateField()
    session_year_id = models.ForeignKey(SessionYearModel, on_delete=models.CASCADE)
    created_at = models.DateTimeField(auto_now_add=True)
    updated_at = models.DateTimeField(auto_now=True)
    objects = models.Manager()
```

```
class AttendanceReport(models.Model):
```

```
    # Individual Student Attendance
```

```
    id = models.AutoField(primary_key=True)
    student_id = models.ForeignKey(Students, on_delete=models.DO_NOTHING)
    attendance_id = models.ForeignKey(Attendance, on_delete=models.CASCADE)
    status = models.BooleanField(default=False)
    created_at = models.DateTimeField(auto_now_add=True)
    updated_at = models.DateTimeField(auto_now=True)
    objects = models.Manager()
```

```
class StudentResult(models.Model):
```

```
    id = models.AutoField(primary_key=True)
```

```

student_id = models.ForeignKey(Students, on_delete=models.CASCADE)
subject_id = models.ForeignKey(Subjects, on_delete=models.CASCADE)
subject_assignment1_marks = models.FloatField(default=0)
subject_assignment2_marks = models.FloatField(default=0)
subject_assignment3_marks = models.FloatField(default=0)
subject_exam_marks = models.FloatField(default=0)
total_assignment_marks = models.FloatField(default=0)
exam_marks = models.FloatField(default=3)
final_assignment_marks = models.FloatField(default=0)
final_grade = models.FloatField(default=0)
comment = models.CharField(max_length=20, default='N/A')
created_at = models.DateTimeField(auto_now_add=True)
updated_at = models.DateTimeField(auto_now=True)
objects = models.Manager()

def calculate_grade(self):
    self.total_assignment_marks = (self.subject_assignment1_marks +
        self.subject_assignment2_marks +
        self.subject_assignment3_marks
    )
    if self.subject_exam_marks == 0:
        self.final_grade = 'N/A'
        self.comment = "
    else:
        self.exam_marks = (self.subject_exam_marks/80) * 3
        self.final_assignment_marks = (self.total_assignment_marks / 20) * 3
        self.final_grade = round((self.exam_marks + self.final_assignment_marks) / 2, 0)
        if self.final_grade >= 3:
            self.comment = 'Outstanding'
        elif self.final_grade >= 2:
            self.comment = 'Moderate'

```

```
elif self.final_grade >= 1:  
    self.comment = 'Basic'  
else:  
    self.comment = 'Fail'  
return self.final_grade, self.comment
```