DESIGN AND IMPLEMENT OF A STUDENT GRIEVANCE APPLICATION

BY

AKE VICTORY

PSC2009990

DEPARTMENT OF COMPUTER SCIENCE,

FACULTY OF PHYSICAL SCIENCES,

UNIVERSITY OF BENIN,

BENIN CITY,

EDO STATE.

NOVEMBER, 2025.

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A PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF COMPUTER SCIENCE, FACULTY OF PHYSICAL SCIENCES, UNIVERSITY OF BENIN, BENIN CITY.
IN PARTIAL FULFULLMENT OF THE REQUIREMENT FOR THE AWARD OF A BACHELOR OF SCIENCE (B.Sc) DEGREE IN COMPUTER SCIENCE.

NOVEMBER, 2025.

CERTIFICATION

This is to certify that this project work was carried out by **AKE VICTORY** with matriculation number **PSC2009990** under my supervision. It is adequate and satisfactory, both in scope and content, for the award of Bachelor of Science (B.sc) Degree in Computer Science of the University of Benin.

_____ _____

MR. I. E OBAYAGBONA **DATE**

(Project Supervisor)

APPROVAL

This project work is hereby approved in partial fulfillment of the requirement for the award of Bachelor of Science (B.Sc.) degree in Computer Science from the University of Benin.

_____ _____

DR. ROSEMARY USIOBAIFO **DATE**

(Head of Department)

DEDICATION

This project is dedicated to God almighty the giver of life for giving me the strength and wisdom to see through to completion, and even throughout my stay in the university of benin(UNIBEN). It is also dedicated to my loving parents Mr. and Mrs. Ake for their love, support and guidance throughout my academic sojourn.

ACKNOWLEDGEMENT

My utmost acknowledgement goes to God Almighty for giving me the strength, wisdom and direction throughout my academic journey. I would like to express my gratitude to my project supervisor Mr. I. E Obayagbona for his consistent guidance towards ensuring the successful completion of this project.

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Finally, I would also like to thank my family and friends for their support, words of encouragement, and consistent guidance throughout this project.

TABLE OF CONTENTS

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Deleted[user]: ….

Deleted[user]: .

Deleted[user]: i

Deleted[user]: iii

Deleted[user]: .i

Deleted[user]: ..

Deleted[user]: vii

Deleted[user]: ..

Deleted[user]: viii

Deleted[user]: ix

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

The Student Grievance Application is a web-based system developed to simplify and modernize the process of lodging, managing, and resolving student complaints in educational institutions. The traditional manual grievance-handling methods are often time-consuming, prone to data loss, and lack transparency. This project aims to overcome these limitations by providing an automated, efficient, and transparent platform where students can submit grievances, track their status, and receive timely feedback. The system is designed with a user-friendly interface that allows students to categorize their complaints such as academic issues, staff behavior, infrastructure, or administrative concerns and submit them securely. Administrators and grievance officers can then review, respond, and update complaint statuses through an integrated management panel. The application also maintains a centralized database for recordkeeping, monitoring trends, and generating analytical reports for institutional decision-making. The system was implemented using modern web technologies including HTML, CSS, JavaScript for the front end, PHP or Python for the back end, and MySQL for data storage. Security features such as authentication, authorization, and data validation were incorporated to protect user information. Overall, the Student Grievance Application enhances communication between students and the institution's management, promotes accountability, and ensures a more transparent and efficient grievance redressal process.

CHAPTER ONE
INTRODUCTION

1.1 BACKGROUND STUDY

Academic growth can be of various concerns in an academic environment to promote social and functioning educational system. There are several challenges in the academic environment that needs to be adequately handled in order to have an effective educational system. The university's complaints management system is a major example. In the past, this problem has greatly hindered academic advancement in many areas of the educational system. This study identifies a variety of methods that can be utilized to manage and resolve academic complaints in order to improve the academic environment. Taking care of complaints entails listening, comprehending, providing a solution, putting that solution into action, and then following up. Dogan and Wilkinson (2016) defined grievance as any expression of dissatisfaction about services or about any professional conduct.

This project defines the policy and steps for handling and resolving grievances and also to appeal for an un-favored situation and for this process to take place there must be automation of the system that will handle the complaints process and appeal method of registration. This automated system will be a platform to receive and act on complaints reported by students of the University, enabling prompt actions on any issue raised by them and to avail services more effectively. The automated system will include a user interface for students and coordinator/ grievance cell member's interface for managing the redressal.

1.2 STATEMENT OF THE PROBLEM

The current system works manually. People have to go directly to a SERVICOM window to give their complaint. It requires huge amount of paper work to maintain the complaint details, a huge expenditure and lots of time is spent on the existing system. Tracking and retrieving of data from bulk of papers is a difficult process.

In comparison to a computerized system, manual systems are usually taxing, less effective, and use unnecessary manpower.

This system is an application that will solve the problem facing student in the University environment. The basic problems facing grievance monitoring are:

i Lack of adequate protection and maintenance of the complaint record in the system creates a doorway for dissatisfaction and information control.

ii Lack of accurate, succinct information on the student's implicit behavior and character.

iii The workforce or any member of management may miss or make unfair grievances as a result of the manual system's poor performance. In this situation, there is no provision for surveying the grievance. This prevents the system from being maintained effectively.

iv There is no method or database in place to screen transfers of grievance made verbally or on paper.

1.3 AIM AND OBJECTIIVES OF THE STUDY

The aim of this project is to design and implement a grievance management system. To achieve this, we shall be guided by the following specific objectives:

i To evaluate the existing system

ii To design ad grievance redressal application that allows students to lay their grievances and receive rapid feedback in a much easier manner than the existing system.

iii To make complaints easier to coordinate, monitor, track and resolve the grievances.

iv To provide an effective tool to identify and target problem areas and find solutions.

v To control redundancy by storing the same data multiple times.

vi Enhancement in the completion of work within the constraints of time.

1.4 SCOPE OF THE STUDY

The system is intended to be an application. It is created to aid students in logging in their grievances and requesting for assistance with any problems. The system will have multiple interfaces, each user will have an interface. There will be an interface for the students, the department coordinators and the system admins. The interface will be accessed by various individuals whose roles will be explicitly defined.

The students will be able to make grievances and view their resolution status while the coordinators will be able to view grievances made by students in their respectful departments, verify them and update their resolution status.

At the server end will be a database containing information pertaining to the users such as usernames, passwords and complaints filed.

1.5 LIMITATIONS OF THE STUDY

The project is a study of the usability of a grievance redressal application and may not give or meet every expectation. The main focus of the project is to develop a system for students to directly file complaints within the university community. Other extended functionalities such as, processing penalties for anybody found being grieved or the punishment for any staff or student found at fault of any complaints, may not therefore be included or where they are, may lack some expected features. Other limitations are:

i The application was not developed to send a notifications.

ii It does not provide the means of any live communication between the complaint and the responder

iii The system cannot work with other web applications. This means that it is not a web service-oriented system.

1.6 SIGNIFICANCE OF THE STUDY

The study of the usability of a grievance redressal application is of paramount importance considering the number of problems that will be solved in the event of a successful adaptation. The significance of the study is to serve better than the existing system which is highly manual and therefore difficult in terms of monitoring grievances in the University, improve database and

enhance effectiveness, efficiency, and security of the system. It is also intended that the study will help in the development of a new and better computer-aided system.

This new system will save time, reduce improper handling of complaint system and also improve the relationship between student, lecturer, and management. The system is expected to be easy as a student can log their complaint anytime, staff and management also can equally respond to student grievances in an easier way.

1.7 DEFINITION OF TERMS

a) **Lecturer:** A person who gives lectures, especially as an occupation at a university or college of higher education (Microsoft Encarta 2009).
b) **University:** A high-level educational institution in which students' study for degrees and academic research is done (Microsoft Encarta 2009).
c) **Academic:** Used to describe things that relate to the work done in schools, colleges, and universities, especially work which involves studying and reasoning rather than practical or technical skills (Oxford Languages).
d) **Registration:** The process of enrolling at a college or university, choosing courses and paying fees at the beginning of an academic term (Microsoft Encarta 2009).
e) **Staff:** A particular group of employees within a company, institution, or organization (Microsoft Encarta 2009).
f) **Grievance:** An official statement of a complaint over something believed to be wrong or unfair (Oxford Languages).

g) **Appeal:** Request by a complainant to have a matter heard and/or reconsidered after receiving an unfavorable decision (Microsoft Encarta 2009).

h) **Procedure:** An established or correct method of doing something (Microsoft Encarta 2009).

i) **Tedious:** Too long, slow, or dull; tiresome or monotonous (Oxford Languages)

j) **Monitoring:** To observe and check progress or quality of something over a period of time; keep under systematic review (Oxford Languages).

k) **Complaint:** A problem or issue which has not been resolved through discussion and progresses to a written complaint (Microsoft Encarta 2009).

CHAPTER TWO
LITERATURE REVIEW

2.0 INTRODUCTION

Universities are a major component of society, and each student has expectations that the institution is responsible for meeting. Such as any general public or government need laws to govern the procedure among its citizen, academic institutions, as well, need regulations to characterize the procedure among its students, academic regulations ought to both involve the faculty's requirements for a grievance and give student the rules to achieving their individual goals or objectives. Students occasionally feel uneasy or resentful about specific decisions, practices, or service circumstances due to varying psychological reasons. For smooth running of the institution is important to pay immediate attention on these grievances and complaints.

A grievance can be defined as an official statement of a complaint over something believed to be wrong or unfair. It can also be defined as an employee's dissatisfaction or sense of personal unfairness relating to his or her employment relationship. This feeling does not have to be expressed to become a grievance or neither does it have to be true or correct.

A grievance, according to Dale Yader, is "a written complaint made by an employee alleging unjust treatment." Keith Davis defines a grievance as "any genuine or imagined feeling of personal unfairness which an employee has over his job relationship,". However, according to Michael J. Jucius, a grievance is "any discontent or dissatisfaction, whether expressed or not, whether or not arising out of anything connected with the company that an employee thinks,

believes, or even feels to be unfair, unjust, or in equitable," regardless of whether it is expressed or not. People are expected to be able to voice their displeasure in a democratic system, whether it be a minor annoyance, a significant issue, or a disagreement with a superior.

The International Labour Organisation (ILO) defines grievances as “a complaint of one or two workers in respect of wages, allowances, conditions of work and interpretation of service stipulations, covering such areas as leave, transfer, promotion, job assignment and termination of service.”

This project aims to provide a standard student grievance system that is functional and effective for recording student issues. These issues include complaints regarding University environment, faculty feedback and fee collection. Thus, this project ensures a democratic campus environment, acquaints all faculty and students about their rights, and also provides a qualitative and quantitative development of the university.

By using complaint management system, a user can upload his complaint from anywhere by using this application on his phone or PC. Users can submit their complaints by easily creating his/her own profile; also, users can check current status of their complaints. It is based on centralize management and only admin can check or solve the complaint, admin also have authority to remove a user.

The main objective of the complaints management system is to make complaints easier to resolve and to target problem areas. It is used to record, resolve and respond to students’ complaints.

Complaint resolution is considered a parameter for measuring the effectiveness of an organization. No organization can be said to be responsive and easy to use unless it establishes a

comprehensive grievance/grievance redressal system. Considering the nature of the complaint and the magnitude of the complaint, a thorough investigation is conducted by cell members (department coordinator), followed by administering of the appropriate solution/punishment.

2.1 REVIEW OF RELATED LITERATURE

According to Advocacy Research (2021), it's critical that grievances be filed before they can be handled. It's crucial to learn the specifics of a complaint and, if possible, to provide supporting evidence.

According to Surbhi (2018), Management can be defined as the process of administering and controlling the affairs of the organization, irrespective of its nature, type, structure and size. It is the act of establishing and upholding a setting in which the organization's members may cooperate and accomplish business goals successfully and efficiently. The practice of managing the issues of discontent or displeasure voiced by complainants, as defined by the terms themselves, is known as complaint management. The handling and control of complaints made by complainants are made possible by complaint management. A collection of people working in the organization and coordinating their efforts to achieve the shared goal are guided by management (Surbhi, 2018).

It is important to note that Salemme (2020) identifies ten steps to effective complaint management. The steps include the following:

1) Listen and Emphasize: When you start a complaint management process by simply hearing the complainant, you will establish a tone of empathy that will help the complainant trust you.

2) Become an Advocate: Empathy is only the first step, complainants also want to know that you will fix the problem and make them satisfied again, and otherwise they would not take the time to reach out.

3) Learn More: You need to know as much about the circumstances as possible.

4) Reiterate the Core Issues: When you listen to understand instead of listening to respond, you communicate a genuine interest in what the person has to say. It is called "active listening", and one of its core tenets is clarifying what you heard before you respond.

5) Identify the cause: Once you know the complaint, you can identify why it happened. Sometimes it will be the company's fault, in which case you'll need to move toward rectifying the issue.

6) Ask the Complainant to Suggest a Solution: Many complainants will already have an idea of what would "make it right", so ask them what they want.

7) Explain Next Steps: Whether you execute the solution yourself or not, your first job is to tell the complainant what happens next. Keeping them informed is another way to show you care. 8) Make It happen: Make sure you know what's happening and when, so if a complainant contacts you to ask about progress, you'll be able to update them.

9) Report Back: When the problem has been fixed, contact the complainant and let them know.

10) Offer Something Extra: Post-resolution is an extremely effective time for companies to "go the extra mile".

Providing top-notch complainant service requires an efficient grievance redressal system. It aids in measuring complainant satisfaction and serves as a useful source of data and feedback for services improvement. People who file grievances are frequently the first to notice when something is not functioning properly (Ombudsman, 2020). It's also important to note that

Grievance Redressal Systems are crucial in organizations where customers come first because they help to comprehend customers' perspectives, foster greater rapport between customers and administrators, and, most importantly, guarantee the highest level of customer satisfaction. Databases used by grievance redressal systems keep track of complainant information and grievances. This can serve as a source of establishing a better connection between the complainant and administrator.

Sudhash C. et al 2012, analysis of various online services provided by, specifically four Indian states, has been presented and the importance of online grievances redressal mechanism is highlighted to combat corruption in the bureaucracy. Various metrics associated with the GRSs have been taken into account, and a scale has been devised. The performance of the states into consideration has been measured on the scale.

Dipankar M. 2012, explores the utility of complaint registration system in India. Fear of revealing the identity makes complainant go anonymous or pseudonymous. It becomes a tough job for the authorities to know the authenticity of the complainant. Therefore, the solution is presented so that complainants can complain being intrepid, at the same time allowing the authorities to examine the originality of the complaints.

The success of an e-governance system, online public grievance redressal system (OPGRS), from the perspective of the citizens of India in Nripendra, P.R et al 2015 is examined using an integrated IS success model. The model includes the elements like system quality, information quality, service quality, perceived usefulness, and perceived ease of use, perceived satisfaction, perceived risk, and behavioral intention. It is hence emphasized as a useful tool for a transparent and corruption free country.

Designed to make government–citizen relationship more effective and transparent, the implications described in van Jasper, T et al 2011 are that new forms of GRSs result in an ebased divide between those who utilize newer forms of grievance redressal for quality improvements in service provision and adverse incorporation of those who still work through 'negotiated spaces' to realize a basic level of service provision.

In Anju, T 2015, there is an emphasis on developing a value-based work culture in educational institutes. Also, there are some ways suggested to structure a preventive measure and fair procedure to develop a better and reliable organizational culture in educational institutions free from issues related to sexual harassment and exploitation.

There is a study of sexual victimization of college women and its methodologically sound assessment is given in Bonnie, S.F et al 2000.

There have been various researches done and papers available on GRSs but all of them are for public sectors companies, municipal corporations, and e-governance systems or contain only one or two of the problems faced by the students in the educational institutions but none of them include each and every domain of grievances related to students.

In addition to that, many systems lack proper channelization of complaints to solve them in time with proper understanding and solution. There is also a need for more transparency and guaranteed solutions.

Proper channelization means a structured way or passage to forward complaints by categorizing them according to their nature, intensity, and urgency and passing them to the concerned authorities in that way. There has no work been done specifically in the domain of problems faced by students in the educational institutions. So, there is a need for developing a system that

is robust, transparent, and fair and allows fast and reliable solutions to each and every problem faced by the students.

Thus, the communication gap between the students and the system may be managed by an automated system of GRS, where students generally are unaware of their rights and hence do not know what to do and what action to take at the time of difficulty or trouble. This lack of information and unawareness among the students is only due to the hazy way of working.

It is good to air a grievance rather than to keep it bottled up. To realize the primary needs of the students and teachers and secure civil liberties for the institute stakeholders, a Grievance Redressal System needs to be constituted. A "Grievance/Complaint" can be defined as any communication that conveys dissatisfaction about an action or lack of action, about services/deficiency of services in an institute and the complainant asks for remedial action.

Grievance Redress Mechanism is part and parcel of the machinery of any administration. No administration can claim to be accountable, responsive and user-friendly unless it has established an efficient and effective system for grievance redressal. In fact, the grievance redressal mechanism of an organization is the gauge to measure its efficiency and effectiveness as it provides important feedback on the working of the administration. With respect to educational institutions, an application for registering and disposing of grievance can do a lot to solve issues and grievances pertaining to admission, attendance, discipline matters, student conduct, fee related matter, evaluation process, observation of norms and standards, violation of rules, discrimination, harassment and other academic and non-academic issues.

The primary objective of the grievance tracking system is to develop a responsive and accountable attitude among all institute constituents in order to maintain a harmonious educational atmosphere in the institute. Grievance redressal technology establishes structured interaction with the complainants to elicit information, identifies systemic flaws in the administration and institutes a monitoring mechanism to oversee the working of the institutional policies.

Alve (2017), in their study created a web application for tracking and resolving complaints. The system was created to handle a variety of issues in the dorms and colleges. The system's goal was to make it simpler to organize, monitor, manage, and handle complaints as well as to give organizations a useful tool for keeping complaint data records and using them to identify service gaps and issue areas. The system has two modules: one for the administrator and one for the user. Consequently, the system has a client-server interaction. Each user is identified uniquely by their user email ID.

2.2 ANALYSIS OF THE EXISTING SYSTEM

The current system manually records and handles complaints. In the current system, different grievances are handled in different ways. For example, the current system has a set of procedures it takes when someone complains about missing scripts.

1. The student informs the course adviser about the problem.

2. The student is then instructed to write a letter to the department's head for official signature.

3. The letter is forwarded by the department's head to the appropriate body to investigate the issue.

4. The personnel in charge then investigates the cause of the missing result i.e., if the student was present for the exam or not.

5. If the student was present for the exam, the script is manually searched for and the problem is rectified.

The current method is not just time-consuming and frustrating. Additionally, it causes delays in the reporting of complaints, particularly those that require immediate attention. By establishing an automated student complaint management system for tertiary institutions, this endeavor attempts to close the gap by giving students a much easier way than the current method to file complaints and obtain prompt feedback. It aims to meet students' demands while making the job of the system administrator and lecturers easier.

2.3 ANALYSIS OF THE PROPOSED SYSTEM

The way in which the current system handles and processes student complaints makes it susceptible to various issues. The proposed system will increase effectiveness by cutting down on the amount of time spent responding to student complaints. Two functional modules of the proposed system are explored in the analysis of the system. The modules are:

1. An application that allows complainants (students) to file their grievances and track the progress of those complaints.

2. A terminal that the system administrator uses to manage users, add new complaint categories, view user logins, and address student complaints.

2.4 USERS OF THE INTERFACE

- Complainant (student)

- Admin
- Grievance cell member/coordinator

2.4.1 COMPLAINANT'S INTERFACE

- Lodge grievances by students, teachers, parents and other staff
- View status of the complaints posted
- View the reply for the complaint posted
- Reopen the grievance case for further investigation
- Detailed account of the grievance in less than 4000 words
- View notifications from the grievance cell members
- Send alert on pending grievances
- Edit and reset profile
- Attach supporting files in favor of the grievance

2.4.2 ADMIIN INTERFACE

- Add grievance cell members
- Create and monitor accounts of grievance cell members
- Verify and approve registered users (complainants)
- Add details of the institution and a management representative
- View complaints sent by the users
- Check the authenticity of the complaints
- Assign complaints to grievance cell members based on the complaint type
- Generate reports on a monthly basis in word/pdf/excel format
- Account Settings to edit and reset admin profile

2.4.3 GRIEVANCE CELL MEMBER INTERFACE

- Option to view complaints sent by the user
- Send reply to the complaints along with attachments, if any.
- View reminders on pending complaints
- Generate report on the total/pending/closed complaints, assigning start and end date
- Give satisfactory solution to re-opened complaints
- Edit and reset profiles.

2.5 BENEFITS OF THE PROPOSED SYSTEM

The mechanism for registration and disposal of grievances enables a complainant to express feelings by initiating and pursuing the grievance procedure in accordance with the rules and regulations of the institution. The portal's key benefit is that it stops unfair practices in higher education institutions and offers a useful method for grievance redress. Additionally, it enables the grievance cell member to conduct inquiries and grievance analyses in a totally private but open way.

- Provides security for affected person to participate without fear of intimidation or retribution
- It provides a fair and speedy means of grievance handling
- Shows clarity in procedures, processes, and time frames adopted
- The affected person need not consult grievance cell members directly to register complaints
- Saves time of affected person and cell members

- Automates entire grievance procedure right from its registration to closure
- Greater confidentiality and transparency in complaints dealing procedure
- Advantage over paper-based systems
- Alerts users immediately on the grievance, action taken etc.
- Round the clock availability
- Builds harmonious education atmosphere in campus
- It’s in compliance with existing systems without undermining them
- Streamlined and systematic grievance reporting
- Serves as an outlet for petitioner’s frustration and discontents.

CHAPTER THREE
SYSTEM ANALYSIS AND DESIGN

3.0 RESEARCH METHODOLOGY

Research methodology is the specific procedures or techniques used to identify, select, process and analyze information about a topic.

In systems engineering, information systems and software engineering, the system development life cycle (SDLC) also referred to as the application development life-cycle is a process for planning, creating, testing and deploying an information system. It can be divided into the following phases:

i) Planning

ii) Analysis

iii) Design

iv) Implementation

v) Documentation

The waterfall development methodology was selected as a methodology for the development of this project.

3.1 WATERFALL METHODOLOGY

The waterfall methodology uses a sequential or linear approach to software development. The project is broken down into a sequence of tasks, with the highest level grouping referred to as phases (Sherman, 2015). The name came from its visual depiction of the process of the model (Pressman, 2005). Its major advantage is in its simplicity and ease of use in implementing the

software. It also gives the developer targeted milestones at the end of every phase as the completion of the first phase is a prerequisite for the continuation onto the second phase (Boehm, 2003).

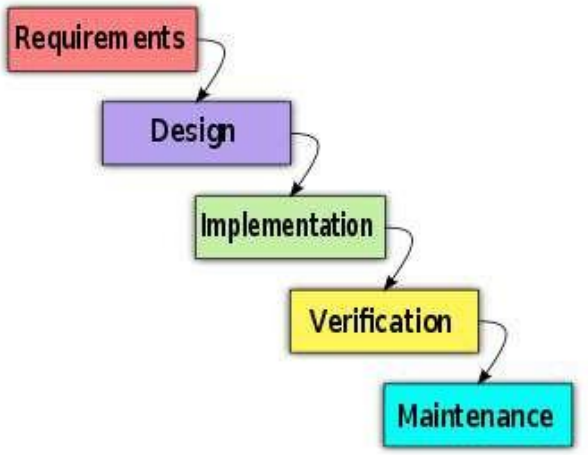


Figure 3.1 the Waterfall Method

3.2 SYSTEM ANALYSIS

System development is a set of structured activities that create a new system or modify an existing system, it refers to all aspects of the process from identifying problems to be solved or opportunities to be exploited to the evaluation and possible refinement of the chosen solution.

System analysis is used as a way of describing and formalizing how all of the elements of a system interact with each other and also show how complex sections of the system are or show the complexity of the system as a whole.

3.2.1 ANALYSIS OF PROPOSED SYSTEM

The proposed system is a mobile application based on the android platform that will address the students' issues and grievances to ensure a conflict-free atmosphere by promoting good student-teacher relationships.

Students may voice their grievances regarding academic matters, harassment, health services, library and other services. Then the Coordinator or a member of the student's grievance cell will work on addressing said issues. Coordinators can view the resolving status of grievances.

3.3 UNIFIED MODELLING LANGUAGE (UML)

UML is a standard documentation for the exhibiting of certifiable objects as an underlying stage in building up an object-oriented outline methodology. It shows the overall system design that enables right decisions to be made early in the process of developing the software. It empowers simplicity of upkeep by giving more viable visual representations of the system.

UML is used primarily for software intensive systems like: systems software and business processes. The following are the most commonly used UML diagrams (Schneider & Winters):

- Use Case Diagrams
- Behavioral Diagrams
- State chart diagrams
- Object diagrams
- Activity diagrams
- Interaction diagrams
- Sequence diagrams

- Collaboration diagrams
- Implementation Diagrams
- Component diagram
- Deployment diagram
- Class Diagrams

3.3.1 USE CASE DIAGRAMS

A use case is a methodology used as a part of a system examination to recognize, illustrate, and form system necessities. A use case is simply an illustrated scenario where a user performs an action with the application (Martin, 2002). The peculiar aspect of a use case is that it makes use of the universal modelling language (UML) diagrams to illustrate the sequence or flow of activities (use cases) that is within the parameters of the created application (subject) carried out by the user (actors (Shaw & Garlan, 2006). This UML diagram makes it very easy for any future programmer or user working on the system to understand it.

A use case scenario was drawn up for the student grievance application and is shown in fig 3.2 below.

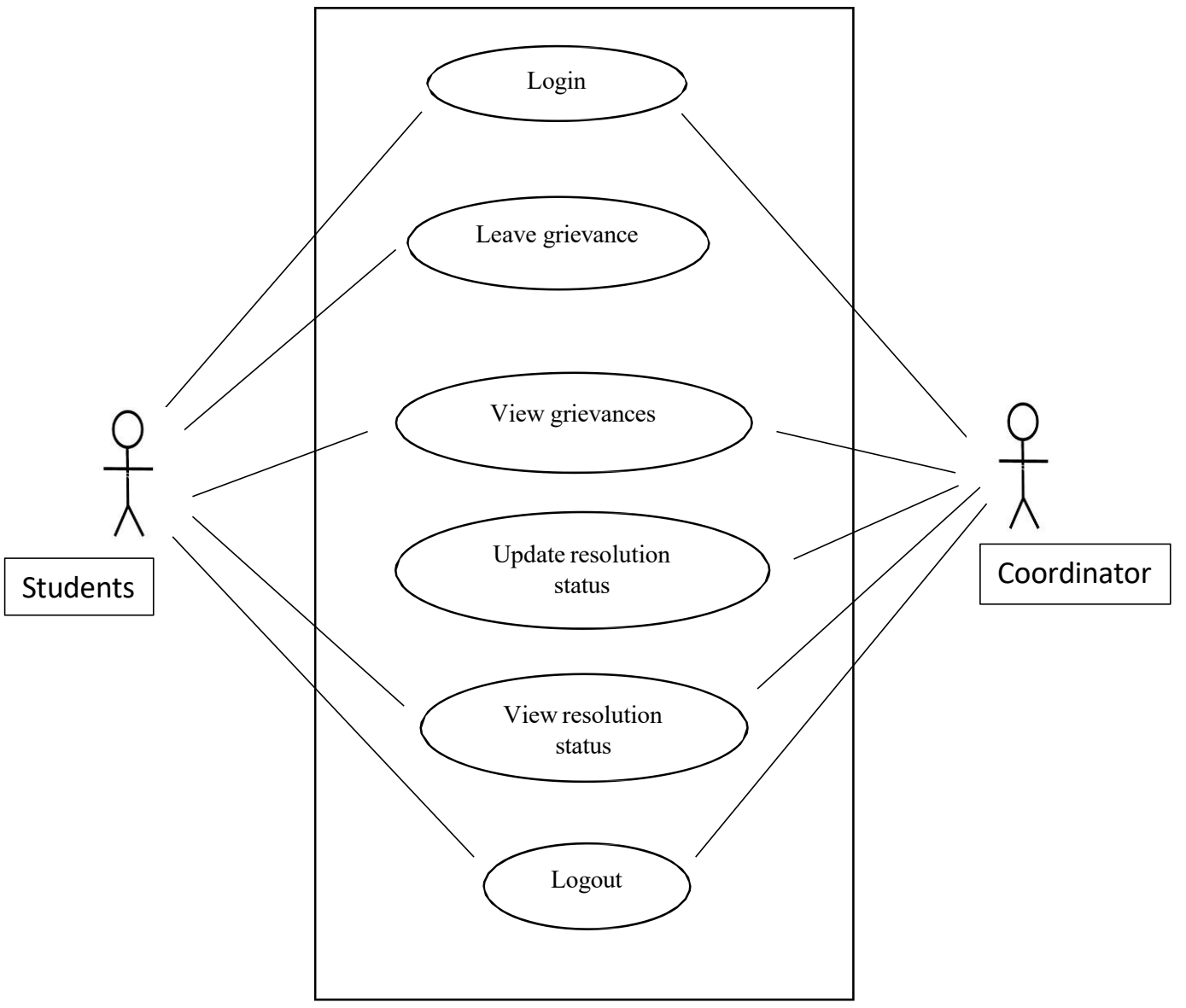


Fig 3.2 Use Case Diagram for Student Grievance Application

3.3 2 SEQUENCE DIAGRAMS

The Sequence Diagram models the cooperation of objects considering a period progression. It shows how the objects interface with others in a particular circumstance of a use case. A

sequence diagram is primarily used to illustrate the flow of logic and also interactions between its various components and users (Bruegge & Dutoit, 2004)

A sequence diagram is also a significant part used as a piece of methodology related to analysis, configuration and documentation. A sequence diagram is otherwise called a timing diagram; event diagram and event scenario.

A simple sequence diagram for the application has been illustrated and is shown in fig 3.3 below

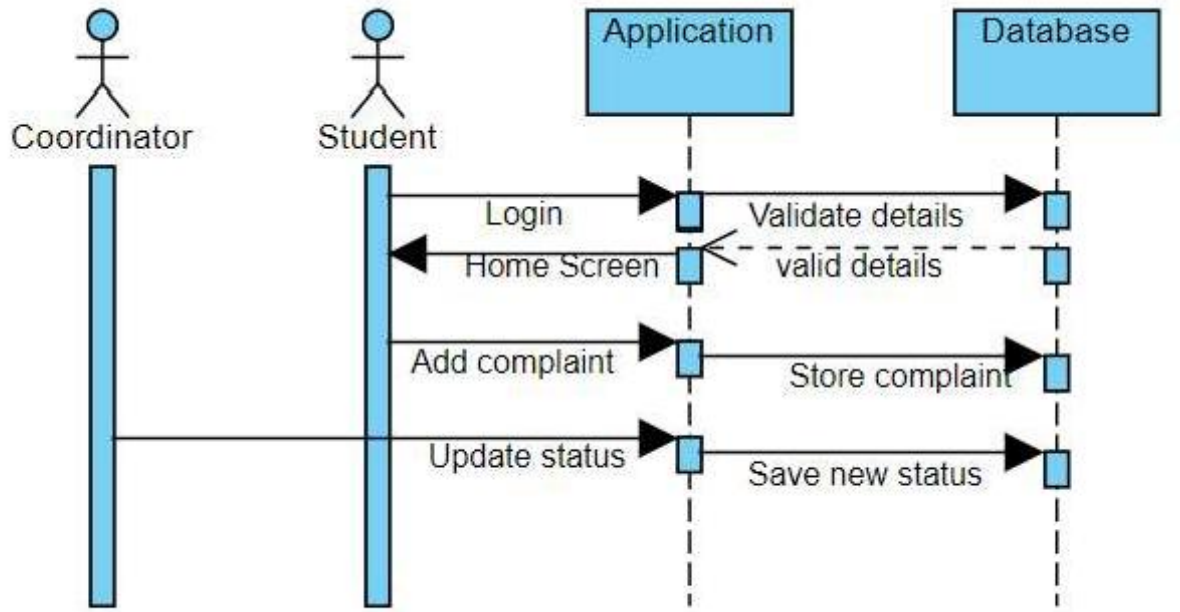


Figure 3.3 Sequence Diagram

3.3.3 ACTIVITY DIAGRAM

Activity diagram is basically a flow chart to represent to the stream structure of one activity to another activity. The activity can be delineated as an operation of the system.). Activity

diagrams are graphical representations of work procedures of stepwise activities and activities with sponsorship for choice, cycle and concurrence.

In UML, activity charts are proposed to indicate both computational and various leveled techniques (i.e. workflows). Activity charts show the general stream of control. Figure 3.4 shows the activity chart for the application.

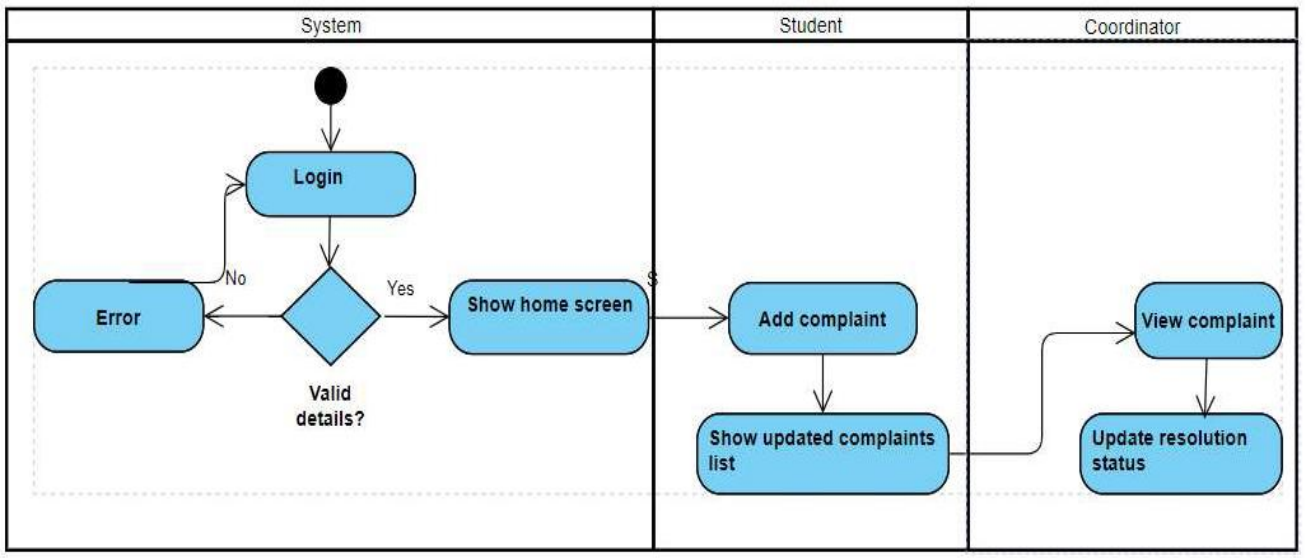


Fig 3.4 activity chart

3.3.4 CLASS DIAGRAM

One of the more popular types in UML is the class diagram. Popular among software engineers to document software architecture, class diagrams are a type of static structure diagram because they describe what must be present in the system being modeled. It describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among objects.

Graphically, a class is rendered as a rectangle, ordinarily including its name, properties, and operations in discrete, doled out compartments. It likewise shows the classes inside of a particular model with each of the classes having their own unmistakable traits, name and operations that can be completed on them and class charts can likewise relate with different classes in a model. Fig 3.5 below shows the class diagram

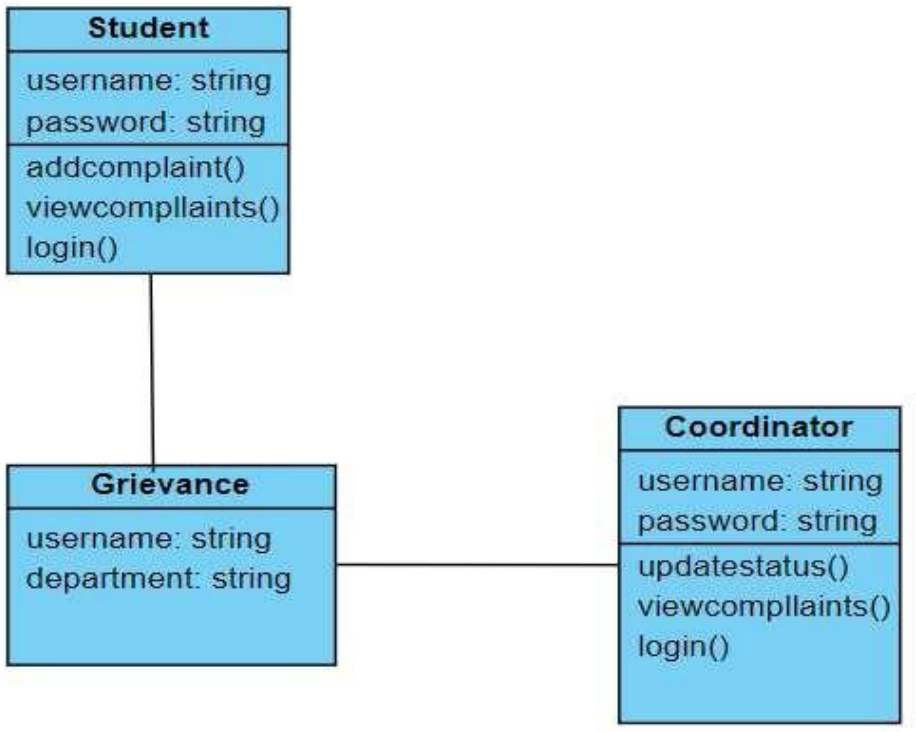


Fig 3.5 class diagram

3.4 DATABASE DESIGN

A database is an organized collection of structured information, or data, typically stored electronically in a computer system. It provides an organized mechanism for storing, managing and retrieving information (Ojo, 2009). The system has an integrated database that allows data to be inputted and retrieved from the database.

A relational database is made up of tables, each of which is an organized arrangement of records and fields. There are three major databases involved in this system and are shown in table 3.1, table 3.2 and table 3.3 below

FIELD NAME	TYPE	DESCRIPTION
User ID	String	Unique identifier for each user
Name	String	Name of the student
Mat No.	String	Matriculation number used for authentication
Password	String	String of characters used for authentication
Grievances	Array<string>	List of grievances made by the student

Table 3.1 Student data table

FIELD NAME	TYPE	DESCRIPTION
Username	String	Unique identifier for each user

Password	String	String of characters used for authentication
Department	String	Department of the coordinator

Table 3.2 Coordinator data table

FIELD NAME	TYPE	DESCRIPTION
Grievance	String	The details of the grievance listed
Department	String	The department the grievance is listed against
Status	String	The status of the resolution of the grievance

Table 3.2 Event data table

CHAPTER FOUR

4.0 IMPLEMENTATION

Implementation is the process of translating the detailed design into codes,

According to Tapadiya (1997), implementation can be best seen as a realization of the entire effort of design. The idea of software development is conceived by the programmer at design time and implementation time.

This section takes a detailed look at the implementation of the student grievance system, this is the aspect that involves writing codes which suits the proposed system.

4.0.1 IMPLEMENTATION ISSUES

Implementation issues occupy a strategic position in the software development no matter what software. The following issues are considered before and during the implementation of the student grievance system;

1. Choice of programming language
2. Hardware and software requirements

4.1 CHOICE OF PROGRAMMING LANGUAGE

The language chosen for designing this system is Python a high level, general-purpose programming language with language constructs and an object-oriented approach to writing clear and logical code for various types of projects.

Kivy an opensource multi-platform GUI development library for Python was used as a framework for the development of the app. It can run on iOS, Android, Windows, OS X, and

GNU/Linux. It helps develop applications that make use of innovative, multi-touch UI. The fundamental idea behind Kivy is to enable the developer to build an app once and use it across all devices, making the code reusable and deployable, allowing for quick and easy interaction design and rapid prototyping.

SQLite was used in the design of the database. Python SQLite3 module is used to integrate the SQLite database with Python. It is a standardized Python DBI API 2.0 and provides a straightforward and simple-to-use interface for interacting with SQLite databases. The development was made on Visual Studio Code, a free source code editor which is made by Microsoft for windows, Linux and macOS with features such as debugging, syntax highlighting, code navigation etc. that make programming easier

4.2 HARDWARE AND SOFTWARE REQUIREMENTS

4.2.1 Hardware requirements

1. 1.6 GHz or faster processor
2. 1 GB of RAM and above
3. 10 GB of hard disk and above

4.2.2 Software requirements

1. Microsoft windows operating system
2. Python
3. Visual Studio Code

4.3 PROGRAM DESIGN METHODOLOGY

Object-oriented programming is a computer programming model that organizes software design around data, or objects, rather than functions and logic. OOP focuses on the objects that developers want to manipulate rather than the logic required to manipulate them. This approach to programming is well-suited for programs that are large, complex and actively updated or maintained.

Once an object is known, it is labelled with a class of objects that defines the kind of data it contains and any logic sequences that can manipulate it.

The grievance system has the following classes;

• The log-in class

This interface is the first instance of the grievance system, it admits users into the system by taking their usemames and passwords which users enter into the system to gain access. New users (students) can create an account which will be verified using matriculation number while coordinators are provided a usemame and password by system admins

• The create account class

This interface allows students to create an account containing their first and last names, matriculation number, usernames and passwords, it stores this in a database

• The table class

This allows users to view griveanves. The students can view the status of their complaints and the coordinators and view the complaints made and update their status

• The complaint class

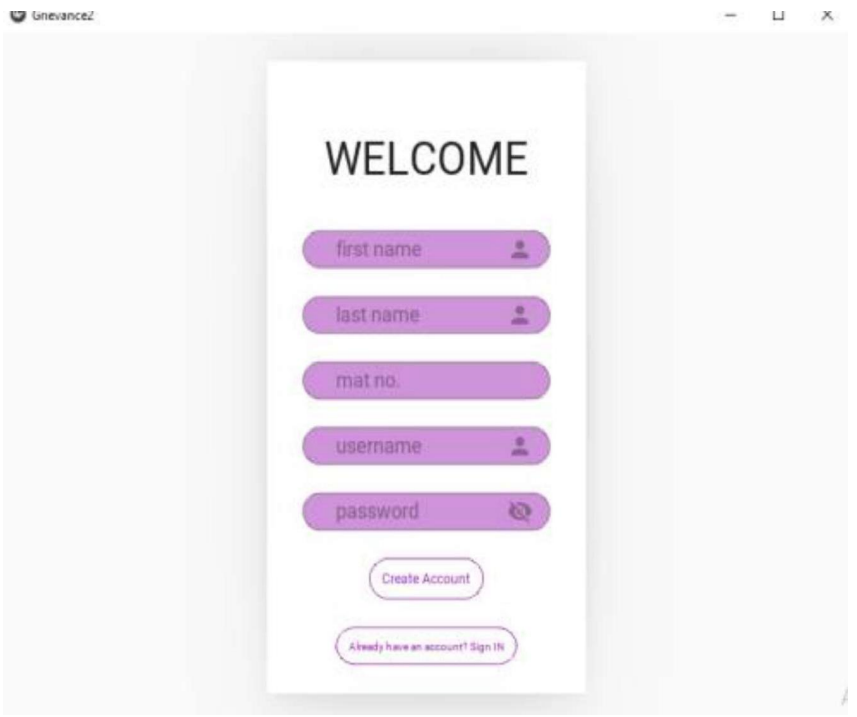
This class allows students to write up a grievance and submit it for review/investigation

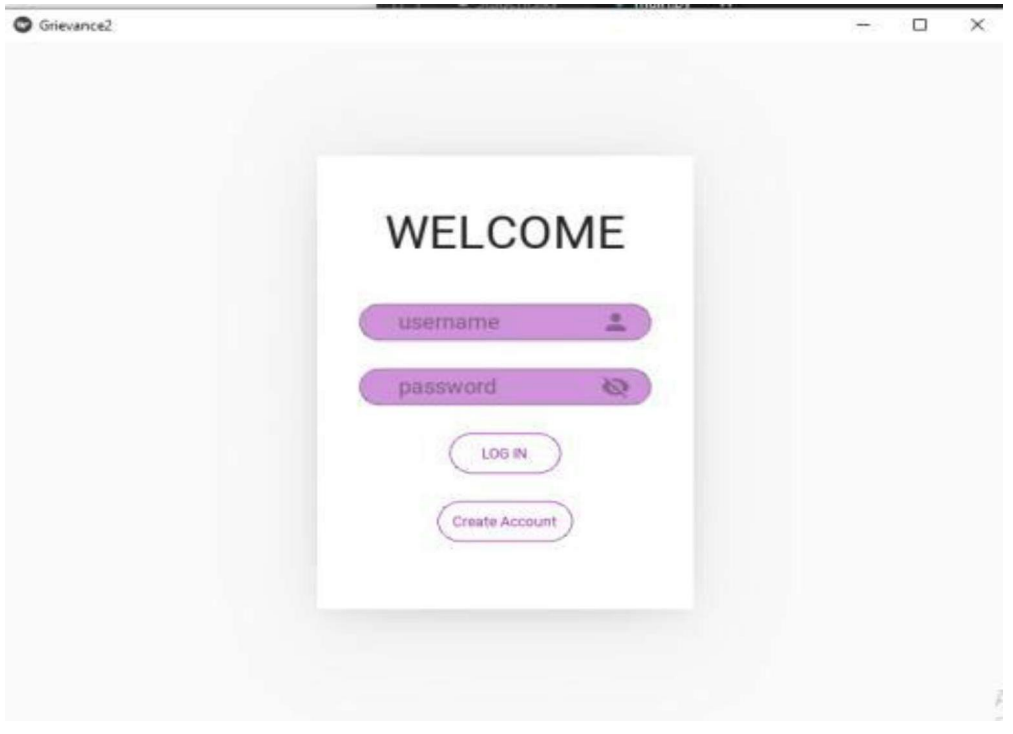
• The log-out class

This enables users to exit the grievance system.

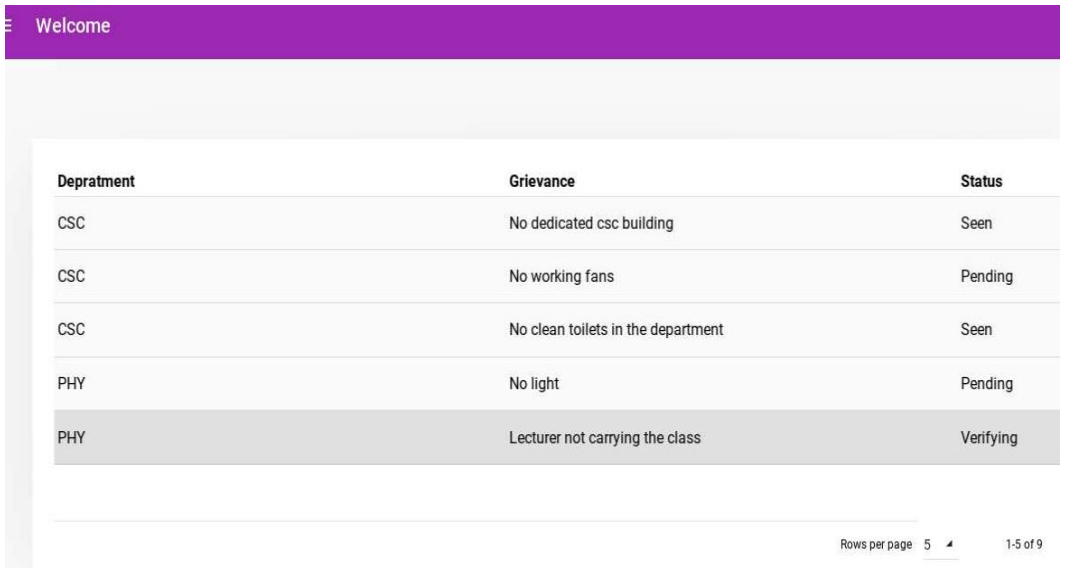
4.3.1 Screenshot Samples

Login screen

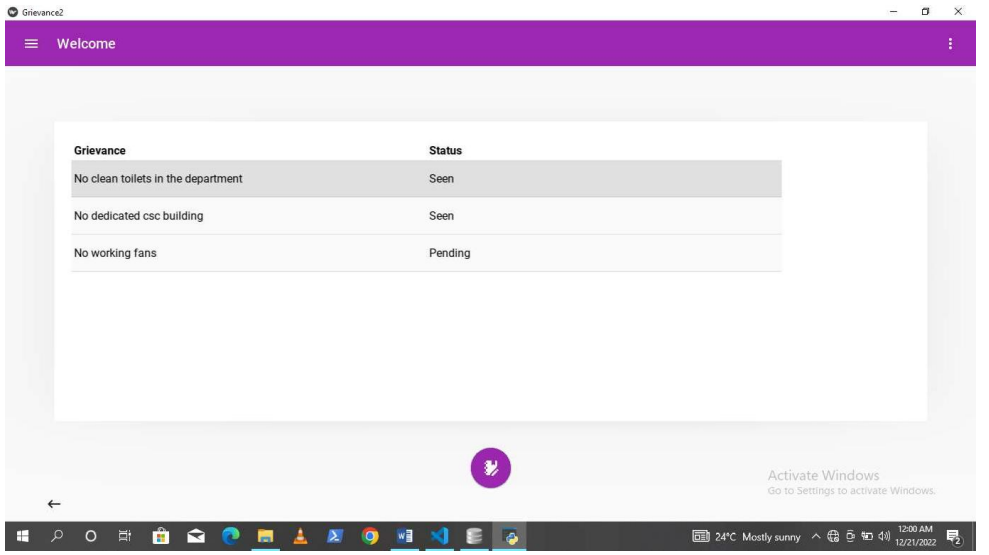




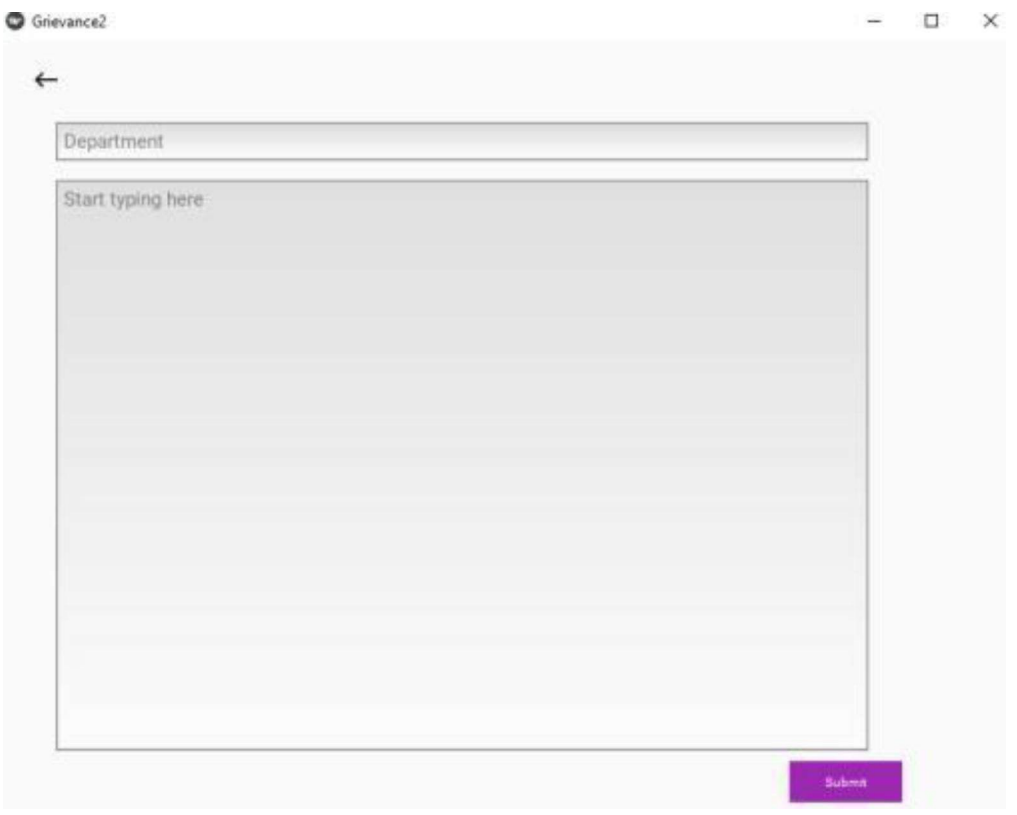
Account creation screen



Student home screen



Coordinator of CSC department home screen



Add grievance screen

4.4 SOFTWARE TESTING

Testing is the process of testing of newly developed systems to ensure the hardware and the operating software is properly intsalled and confugured ensuring other systems parameters are properly established. The developed system will be subjected to various forms of testing

4.4.1 IMPLEMENTATION OF THE SUBSYSTEM

Unit testing deals with testing a unit as a whole. This would test the interaction of many functions. This would test the interaction of many functions but confine the test within one unit. Table 4.1 shows the unit test of the system; i.e. the test data, thee expected result and the actual result. When a user fills the login form with the correct data, it is expected that the page will be redirected to another page based on the login type. The result of the test is the redirection of the page to another, based on the login type.

Table 4.1 Unit testing. The Test Data, Expected Data, and Actual Result

The Test Data	Expected Test Result	Actual Test Result
Login Screen	The page where users are redirected to their home screen	The login screen
Home Screen	The page where users are redirected to other screens	The home screen
Fill grievance	Expected to see the students grievance form	The students grievance form appears

Submit	Expected that information submits to database	Students' information submits to database
View grievance	Expected that the form is displayed	Form is displayed

QUERY SUBSYSTEM IMPLEMENTATION: The following are the result of the subsystem queries.

Users form: The users' database holds the usemame and password of all users of the application. Access is denied or granted based on a match between the user entered values and the values stored in the database.

Students' grievance form: The students' grievance form table contains the grievances submitted by the student, including the student's usemame, department, etc.

4.4.2 THE TEST PLAN

During the testing of the proposed system, the following were targeted:

a. The fully integrated software applications including the external computer peripherals devices, were tested in order to check how components interact with one another and with the system as a whole (This is also called End to End scenario testing)

b. Verification through thorough testing of every input in the application to check for desired outputs.

c. Testing of the user's experience with the proposed system application.

d. Building of detailed test cases and test suites that test each aspect of the application as seen from the outside without looking at the actual source code.

4.4.3 TEST DATA

Various forms where filled with input data that is compatible with the data type defined in the database. An example is the students' information form with input fields like first name, last name, Mat. No etc. and the corresponding inputs as Emmanuella, Tudome, PSC1707584. Incompatible data types were also used to test for abnormally and exceptions and such data were not rejected.

4.5 DOCUMENTATION

Documentation is the process of writing the written text or illustrations that accompany computer software. It explains how the software is being used from the input design to the output design

CHPTER FIVE

CONCLUSION

This project has demonstrated a proposed GRS system for the grievance redressed of students covering various domains of complaints which could be lodged easily and thus leading to easy and sure solutions or redress to the problems being faced by a student on a regular basis. The technologies used comprise of Python to design a user-friendly graphical user interface, SQLite to keep track of the records at the back end. This system would be suitable for any organization for the resolution of complaints and thus lead to a qualitative and quantitative development of the organization

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APPENDIX

SOURCE CODE LISTING

Main code

```
from kivy.lang import Builder
from kivymd.app import MDApp
from kivy.uix.screenmanager import ScreenManager, Screen
from kivymd.uix.list import OneLineListItem
import sqlite3
from kivy.properties import ObjectProperty
from kivymd.uix.datatables import MDDataTable
from kivy.metrics import dp
from kivymd.uix.menu import MDDropdownMenu
from kivy.uix.anchorlayout import AnchorLayout


class Login(Screen):
    pass

class CreateAcc(Screen):
    pass

class WinMan(ScreenManager):
    pass

class Com(Screen):
    pass

class Home(Screen):
    pass
```

```
class Ahome(Screen):
    pass

class Update(Screen):
    pass

class Grievance2(MDApp):

    def build(self):
        self.theme_cls.theme_style = "Light"
        self.theme_cls.primary_palette = "Purple"

        return Builder.load_file("students.kv")

    def cre(self):
fname = self.root.get_screen("create").ids.fname.text
lname = self.root.get_screen("create").ids.lname.text
mno = self.root.get_screen("create").ids.mno.text
uname = self.root.get_screen("create").ids.uname.text
passw = self.root.get_screen("create").ids.passw.text
conn = sqlite3.connect("whynot.db")
c = conn.cursor()
sql = ("""INSERT INTO users
            (First_Name, Last_Name, Mat_No, Username, Password)
            VALUES (?, ?, ?, ?, ?);""")
udata = (str(fname), str(lname), str(mno), str(uname), str(passw))
c.execute(sql, udata)
conn.commit()
conn.close()
```

```
def log(self):
    user = self.root.get_screen("log").ids.user.text
    passw1 = self.root.get_screen("log").ids.passw1.text
    conn = sqlite3.connect("whynot.db")
    c = conn.cursor()
    mop = ("""SELECT * from users
              WHERE Username = ? AND Password = ? """)
    uin = (str(user), str(passw1))
    c.execute(mop, uin)
    dat = c.fetchall()
    amop = ("""SELECT * from admins
                WHERE Username = ? AND Password = ? """)
    c.execute(amop, uin)
    adat = c.fetchall()
    if (len(dat) >= 1):
        self.root.current = "home"
    elif (len(adat) >= 1):
        self.root.current = "ahome"
    else:
        self.root.get_screen("log").ids.welcome_label.text = "Account not found"
        self.root.get_screen("log").ids.user.text = ""
        self.root.get_screen("log").ids.passw1.text = ""
    conn.commit()
    conn.close()

def submit(self):
    dmnt = self.root.get_screen("comt").ids.dmnt.text
    griev = self.root.get_screen("comt").ids.griev.text
```

```
    sup = self.root.get_screen("log").ids.user.text
    conn = sqlite3.connect("whynot.db")
    c = conn.cursor()
    c.execute("PRAGMA foreign_keys = ON")
    sub = ("""INSERT INTO grievance
                (Department, Grievance, Supplicant)
                VALUES (?, ?, ?);""")
    gdata = (str(dmnt), str(griev), str(sup))
    c.execute(sub, gdata)
    conn.commit()
    conn.close()
    self.root.get_screen("comt").ids.dmnt.text = ""
    self.root.get_screen("comt").ids.griev.text = ""


def table(self):
conn = sqlite3.connect("whynot.db")
c = conn.cursor()
c.execute("PRAGMA foreign_keys = ON")
supl = self.root.get_screen("log").ids.user.text
c.execute("""SELECT Department, Grievance, Status from grievance
            WHERE Supplicant = ? """, [supl])
rows = c.fetchall()
conn.commit()
conn.close()

hm = self.root.get_screen("home")
self.gtable = MDDataTable(
    pos_hint = {"center_x": 0.5, "center_y": 0.5},
    use_pagination = True,
```

```
            size_hint = (0.9, 0.6),
            column_data = [
                ("Depratment", dp(100)),
                ("Grievance", dp(100)),
                ("Status", dp(100)),
            ],
            row_data = rows

        )
        hm.add_widget(self.gtable)
        return hm

    def atable(self):
        conn = sqlite3.connect("whynot.db")
        c = conn.cursor()
        c.execute("PRAGMA foreign_keys = ON")

        alog = (self.root.get_screen("log").ids.user.text)

        c.execute("""SELECT grievance.Grievance, grievance.Status from grievance
                    INNER JOIN admins  ON grievance.Department = admins.Department
                    WHERE admins.Username = ?""", [alog])
        glist = c.fetchall()

        conn.commit()
        conn.close()

        ahm = self.root.get_screen("ahome")
        gtable = MDDataTable(
```

```
            pos_hint = {"center_x": 0.5, "center_y": 0.5},
            size_hint = (0.9, 0.6),
            rows_num = 10,
            column_data = [
                ("Grievance", dp(100)),
                ("Status", dp(100)),
            ],
            row_data = glist
        )
        ahm.add_widget(gtable)
        return ahm
Grievance2().run()
```

The UI/UX

```
#:kivy 2.0.0
 WinMan:
    Login:
    CreateAcc:
    Com:
    Home:
    Ahome:
    Update:
<Login>:
    name: "log"
    user: user
    passw: passw1
    Screen:
        MDCard:
            size_hint: None, None
```

```
size: 300, 400
pos_hint: {"center_x": 0.5, "center_y": 0.5}
elevation: 10
padding: 25
spacing: 25
orientation: 'vertical'

MDLabel:
    id: welcome_label
    text: "WELCOME"
    font_size: 40
    halign: 'center'
    size_hint_y: None
    height: self.texture_size[1]
    padding_y: 15

MDTextFieldRound:
    id: user
    hint_text: "username"
    icon_right: "account"
    size_hint_x: None
    width: 200
    font_size: 18
    pos_hint: {"center_x": 0.5}

MDTextFieldRound:
    id: passw1
    hint_text: "password"
    icon_right: "eye-off"
```

```
    size_hint_x: None
    width: 200
    font_size: 18
    pos_hint: {"center_x": 0.5}
    password: True

MDRoundFlatButton:
    text: "LOG IN"
    font_size: 12
    pos_hint: {"center_x": 0.5}
    on_release:
        app.log()
        root.manager.transition.direction = "left"

MDRoundFlatButton:
            text: "Create Account"
            font_size: 12
            pos_hint: {"center_x": 0.5}
            on_release:
                app.root.current = "create"
                root.manager.transition.direction = "left"

        Widget:
            size_hint_y: None
            height: 10

<CreateAcc>:
    name: "create"
    fname: fname
```

```
lname: lname
mno: mno
uname: uname
passw: passw
Screen:
    MDCard:
        size_hint: None, None
        size: 300, 550
        pos_hint: {"center_x": 0.5, "center_y": 0.5}
        elevation: 10
        padding: 25
        spacing: 25
        orientation: 'vertical'

        MDLabel:
        id: welcome_label
        text: "WELCOME"
        font_size: 40
        halign: 'center'
        size_hint_y: None
        height: self.texture_size[1]
        padding_y: 15

MDTextFieldRound:
    id: fname
    hint_text: "first name"
    icon_right: "account"
    size_hint_x: None
    width: 200
```

```
    font_size: 18
    pos_hint: {"center_x": 0.5}

MDTextFieldRound:
    id: lname
    hint_text: "last name"
    icon_right: "account"
    size_hint_x: None
    width: 200
    font_size: 18
    pos_hint: {"center_x": 0.5}

MDTextFieldRound:
    id: mno
    hint_text: "mat no."
    size_hint_x: None
    width: 200
    font_size: 18
    pos_hint: {"center_x": 0.5}

MDTextFieldRound:
    id: uname
    hint_text: "username"
    icon_right: "account"
    size_hint_x: None
    width: 200
    font_size: 18
    pos_hint: {"center_x": 0.5}
```