



Klaegen

Senior Project Documentation

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ABSTRACT

Klaegen is a web-based application designed to issue and keep track of complaints made by students. It also has the feature to let its users issue anonymous complaint under a forum section. Administrators of the system will have for task to control all activities on the platform such as creating users, adding complaint categories and assigning task to different services (e.g: plant and service, departement, IT department). Features such as updating issues will also be available to provide feedbacks to users about their complaints. Klaegen can also generate statistical reports to track down certain metrics about complains (e.g: most occuring complaints, numbers of complaints under a specific factor).

Keywords: complaint, anonymous forum, statistical reports, feedbacks.

CHAPTER 1- INTRODUCTION

As an independent platform, Klaegen will focus on issues faced by students at Asia Pacific International University. It is very common for students at APIU to make complaints whenever they feel something is wrong. Currently the whole process to issue a complaint is done manually and happens to be slow sometimes. Which is why Klaegen comes as an aid to speed up the process and to make it more efficient. As far as the admin staff is concerned, the need to collect, review and assess different complaints can help to trigger different areas where APIU can better itself.

1.1 PROBLEMS WITH THE CURRENT SYSTEM

- Currently, In order to issue a complaint, students have to walk up to the office of the concerned party where they need to address the complaint. They will issue their complaint but have no feedback afterward nor any detail about the complaint.

This process usually takes a lot of time.

- Also there is communication issue. Some students really feel shy to bring up any issue to any staff member. Some are simply afraid to get their names associated to any discovered issue.
- Another inconvenience with the current system is that it's hard for staff members to have a statistical generated report of all the complains. As a result it appears to be a pain to know which area does the school need to improve or to track down complaints habits.

1.2 OBJECTIVES/PROPOSED SOLUTION

Below are the objectives of Klaegen:

- To enable complaints to be issued.
- To easily monitor and track complain.
- To speed up the complaint process and provide fast feedback to the users
- To help APIU identify and target areas where there seem to be recurring complaints.
- To provide anonymity to students when issuing a complaint.
- To provide better data storage and specific data retrieval(of complains).
- To generate statistical reports about complaint.

- To provide a flexible platform for different types of complaints.

1.3-Purpose of the study

Klaegen has for purpose to provide an online platform where students can issue their complains or where they can discuss about issues that need to be addressed to the University.Klaegen will have 2 interfaces.A private and a public.

The purpose of the private interface is to help issue complains while being anonymous and protect to protect the identity of the user.

Klaegen will be advantageous because it will provide a much more organized and centralized platform where students can issue complaints and staff members can keep tracks of those complaints issued.It also facilitates the storage of data and organize it in a more flexible way. Thus as a student of Asia Pacific I also felt the need to conduct this study in order to tackle or solve the issues previously mentioned so that students can be have a system they can rely to when they want to issue a complaint.

1.4-BENEFITS OF THE SYSTEM

The system will be beneficial for Asia Pacific International University in the following ways:

- It will make collection of data(complaints) easy.
- It will help target specific area that need to be addressed seriously
- Make complaints easy to be managed.

On the side of the students, they will benefit from the system as

- It will provide them a platform where they can issue any complaints without having to walk up to the office of the concernee
- Less time consuming.
- Track the state of their complaints.
- Solve communication barrier (For example with shy students).
- Provides anonymity.

1.5-METHODOLOGY

In Order to know the features and the requirement of the system, a short observation study has been conducted. The study consisted of submitting a complaint to the dean and see how it will be handled. Also with the help of the RA I could know in details how the complaint was treated. One big issue when submitting a complaint in the Dean's office is that there are no documents or file to support the complaints. Usually students won't think about having a video or a picture of what they want to be solved (If that requires one) and so it's hard for the dean to guess what the exact issue is. As such he/she has to either go to the source of the issue or Send an RA to do so. This whole process can take days because they sometime forget. After that, another issue is that students have no idea whether or not their complaint have actually been sent to be treated or if it is being treated they simply have to wait, which is very inconvenient.

Based on that research, Klaegen will implement some functionalities to allow students to attach a file when submitting a complaint. To also provide a way for student to track their complaints (With Feedbacks)

1.6-SCOPES AND CONSTRAINTS OF KLAEGEN

Klaegen is a web based application that allow students of Asia Pacific International University to submit their complaints easily.It is designed to be used only by Students of Asia Pacific International University and only within its boundary*(Intranet). Having a link In SARRA to redirect students to the platform would be advantageous.

Complaints submitted by the students will be stored in a database.(Preferably one allocated for that on the school server).

There will be 3 actors in the system:

- users who will be students
- staffUsers who will be any staff employee of Asia Pacific International University
- admin who will be the one in charge on all the activities occurring on Klaegen
(Preferably a staff employee)

Klaegen will be able show all the users in the system and keep track of who logs in or out.

Unfortunately Registration or Login details should be Provided by manually by the students and not by SARRA, as both API(s) do not communicate.

LANGUAGES USED

- HTML/CSS (bootstrap framework)
- PHP(for back-end)
- Mysql (database)

-Javascript (Client Side), Ajax (Not a programming language, used for asynchronous data exchange)

KLAEGEN USER REQUIREMENT

- A device with a Network Interface Controller (Since Klaegen)
- Be within APIU intranet.

CHAPTER 2- LITERATURE REVIEW

As previously mentioned, Klaegen was developed using languages such as PHP, MYSQL, HTML, CSS, JAVASCRIPT. the choice for these languages was that they best fit the web environment for what Klaegen is supposed to do. Below are some definitions and how they have proven to be useful to Klaegen.

-PHP:

PHP stands for Hypertext Pre-processor. It is a popular general-purpose scripting language that is especially suited to web development. (<https://en.wikipedia.org/wiki/PHP>) It runs on the server side and can be embedded into HTML.

PHP was useful to klaegen because as it served to manipulate, create, edit, delete and update data provided by users.

-MYSQL

MySQL is a database management system that allows you to manage relational databases. (<https://www.mysqltutorial.org/what-is-mysql/>). It is based on SQL (Structured Query Language). The most common use for mySQL, is for the purpose of a web database. It can be used to store anything from a single record of

information to an entire inventory of available products for an online store. (<https://www.123-reg.co.uk/support/servers/what-is-mysql-and-why-do-i-need-it/>)

As far as Klaegen is concerned, It was used to store informations about students and staff members which is used for login purposes and also to store complaints made by students.

-HTML

Hypertext Markup Language (HTML) is the standard markup language for creating web pages and web applications . With Cascading Style Sheets (CSS) and JavaScript , it forms a triad of cornerstone technologies for the World Wide Web . Web browsers receive HTML documents from a web server or from local storage and render the documents into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document.

HTML was used in Klaegen to render out the UI or the web page that users will see in order to interact with the system. Additionally it serves and a tool for the building block of layouts that will make the UI/UX comfortable for users.

-CSS/BOOTSTRAP

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language like HTML previously mentioned. (https://en.wikipedia.org/wiki/Cascading_Style_Sheets) CSS is designed to enable the separation of presentation and content, including layout, colors, and

fonts. This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple web pages to share formatting by specifying the relevant CSS in a separate .css file, and reduce complexity and repetition in the structural content.

Bootstrap is a free and open-source CSS framework which aims for responsivity and front-end web development. It is commonly used as template to style HTML elements which was the case with Klaegen.

-JAVASCRIPT:

JavaScript is an open source & most popular client side scripting language supported by all browsers. JavaScript is used mainly for enhancing the interaction of a user with the webpage. (<https://www.guru99.com/interactive-javascript-tutorials.html>)

-AJAX

AJAX stands for Asynchronous JavaScript And XML. In a nutshell, it is the use of the XMLHttpRequest object to communicate with servers. It can send and receive information in various formats, including JSON, XML, HTML(Which was used in Klaegen), and text files. AJAX's most appealing characteristic is its "asynchronous" nature, which means it can communicate with the server, exchange data, and update the page without having to refresh the page.

The implementation of AJAX in Klaegen was to fetch user's informations and display them in a modal without having to refresh the page.

-Password Hash:

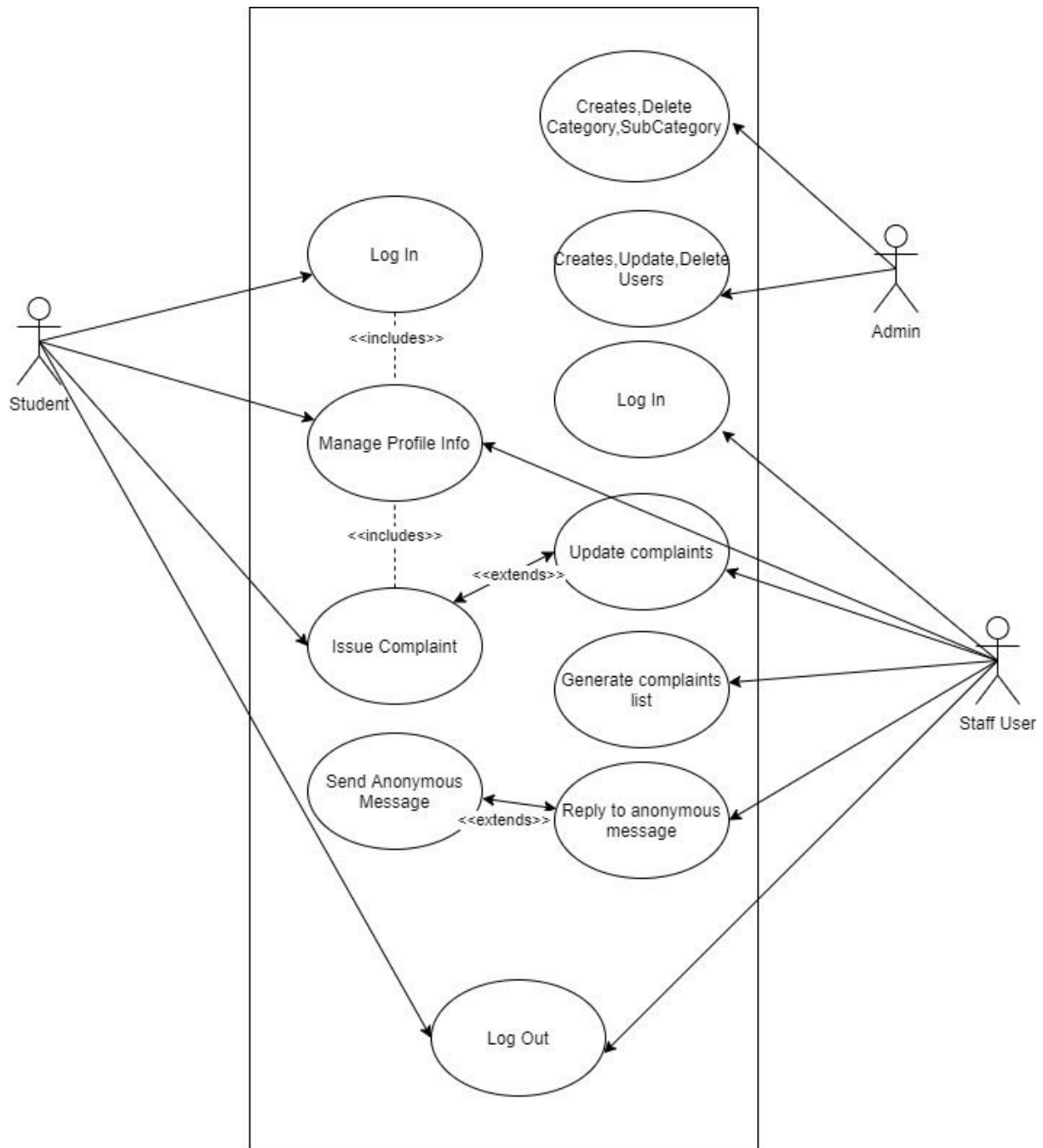
password hash is a php method used to create passwords hash using a strong one-way hashing algorithm. `password_hash()` is compatible with `crypt()` or `bcrypt()` by default. Therefore, password hashes created by `bcrypt()` can be used with `password_hash()`.

This method was used in Klaegen to make sure that the information of the sender remains anonymous whenever students want to send anonymous messages.

By using the `password_hash()` method we are getting a unique salt each time the function is used thus making the hash to also randomise and unique. having new salt generated each time slows down attack and make it hard to decrypt any data.

CHAPTER 3 - ANALYSIS AND DESIGN

3.1) Use Case Diagram



Fig(3.0) Use case diagram depicting the interaction of different actors with the system.

Use Case Definitions

Name	Log In
Actor	Student, Staff User, Admin
Goal	Allow access to the system
Pre-Conditions	-Provide valid Student ID number and Password for Student -Provide valid username and Password for Staff Users as well as Admin
Triggers	Access to use the system
Priority	High
Description	1)During login the actor is asked for his credentials. 2)He/She inputs the requested data 3)If correct, the system grant access to the actor
Alternative	3.1)The system provides a feedback to the actor when the data provided are incorrect. 3.2)The actor has to repeat Step 2 or Use the reset password option
Post-conditions	Actor's session is created.

Basically the login function allows the actor to have an access to the system while maintaining a session for that actor.

Name	Manage Profile Info
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Actor	Student, Staff User
Goal	Allow actor to update their Personal Information
Pre-Conditions	-Actors need to have a login session created
Triggers	New Personal information assigned to actors.
Priority	Medium
Description	1-The actor session is created. 2-clicks on a links that directs him to page where he can fill in his information 3-Fill in his information 4-clicks on update 5-New information entered will be saved in the database
Alternative	-The user didn't input his information{The system will trigger a feedback } -The actor provided an invalid file for his picture.
Post-conditions	Actor's Personal data are updated

Manage Profile Info gives the actor the ability to modify or update his identity informations or credentials such as password.

Name	Register a Complaint
Actor	Student
Goal	To send a complaint to a chosen staff user
Pre-Conditions	Actor need to have a session created
Triggers	Submission of a new complaint
Priority	High
Description	1-Logs in to the system

	2-Clicks on Issue Normal Complaint 3-Fills in the required data 4-Selects a receiver 5-Clicks on Send 6-The system sends the complaint to the chosen receiver.
Alternative	1-The actor doesn't have a session created 1.1-The system sends back the actor to the login page. 2-The actor forgets an input 2.1-The system notifies that to the actor 2.2-The actor goes to the forgotten field and fills it 2.3-The actor sends the complaint
Post-conditions	A new complaint has been sent and saved in the database

Register a Complaint is a function that is only available to one type of actor which is the student. This function enables him to send a complaint to a staff member. As of now the student can only send one complaint to one staff member at a time.

Name	Sends Anonymous Message
Actor	Student
Goal	To send an anonymous message without no identity attached to the message
Pre-Conditions	Have a session established
Triggers	Submission of a message
Priority	High
Description	1-Actor has an established session 2-Clicks on Encrypted Complaint 3-Fills in the form(Description) 4-Choose whom to send the message to 5-Clicks on Send

	6-Gets a notification that the message has been sent.
Alternative	1-Actor no session established 1.1-Gets Redirected to the Login page 2-Actor has an established session 2.1-Don't select a receiver or fill in the description. 2.2-Get a notification from the system 2.3-Selects a receiver and fills in the form 3-Clicks Send 4-Gets a notification
Post-conditions	Sends a message to the selected receiver without revealing the identity of the sender(actor)

Name	Update Complaint
Actor	Staff User
Goal	To update the state or set the feedback of a complaint
Pre-Conditions	Have a staff user session created
Triggers	The updation of a complaint
Priority	HIGH
Description	1-Staff user has an established session 2-Clicks on Pending Complaints or Processing Complaints 3-See a list of Complaints 4-Click on the desired one 5-Reads the complaint as well as the attached file(If provided by the user) 6-Set a Status to the complaint(Processing or Closed) 7-Type in a feedback for the complaint 8-Clicks on Update
Alternative	1-Actor no session established

	1.1-Gets Redirected to the Login page
Post-conditions	Update the complaints to the selected status in the database and set a feedback to it.

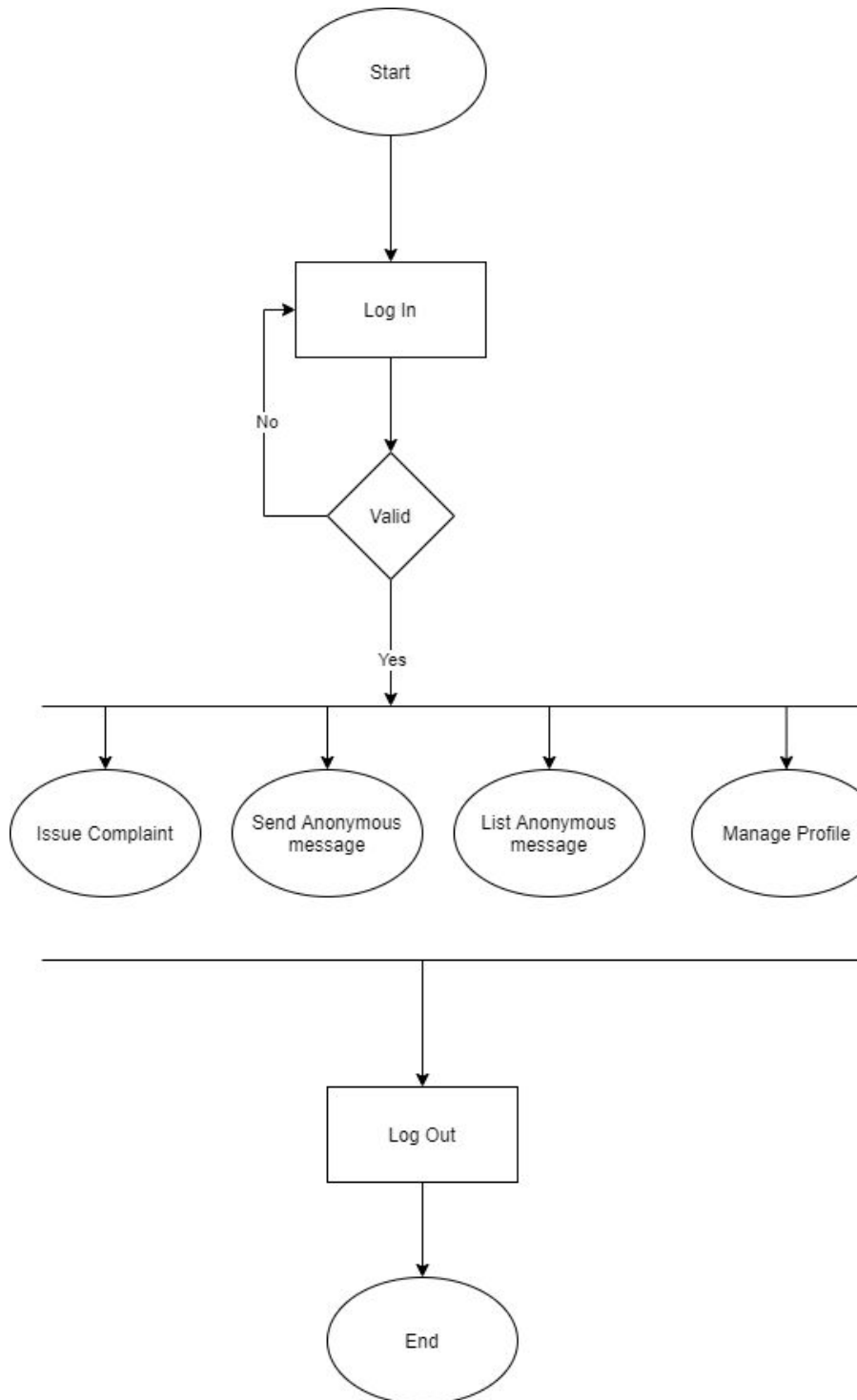
Name	Generate Complaint List.
Actor	Admin,Staff User.
Goal	Generate a list of Complaints.
Pre-Conditions	Have an established session.
Triggers	A list of complaints under specific criteria.
Priority	Low.
Description	1-Actor has an established session. 2-Clicks on the desired Complaint Status. 3-Is Presented with a table of data. 4-Has the option to search for a specific criteria. 5-Has the option to filter the table. 6-Has the option to Print,Download as CSV. or copy into Clipboard the presented data.
Alternative	1-Actor no session established. 1.1-Gets Redirected to the Login page.
Post-conditions	Generates a list of complaints based on the actor's input.

Name	Log Out.
Actor	Student, Staff user, Admin.

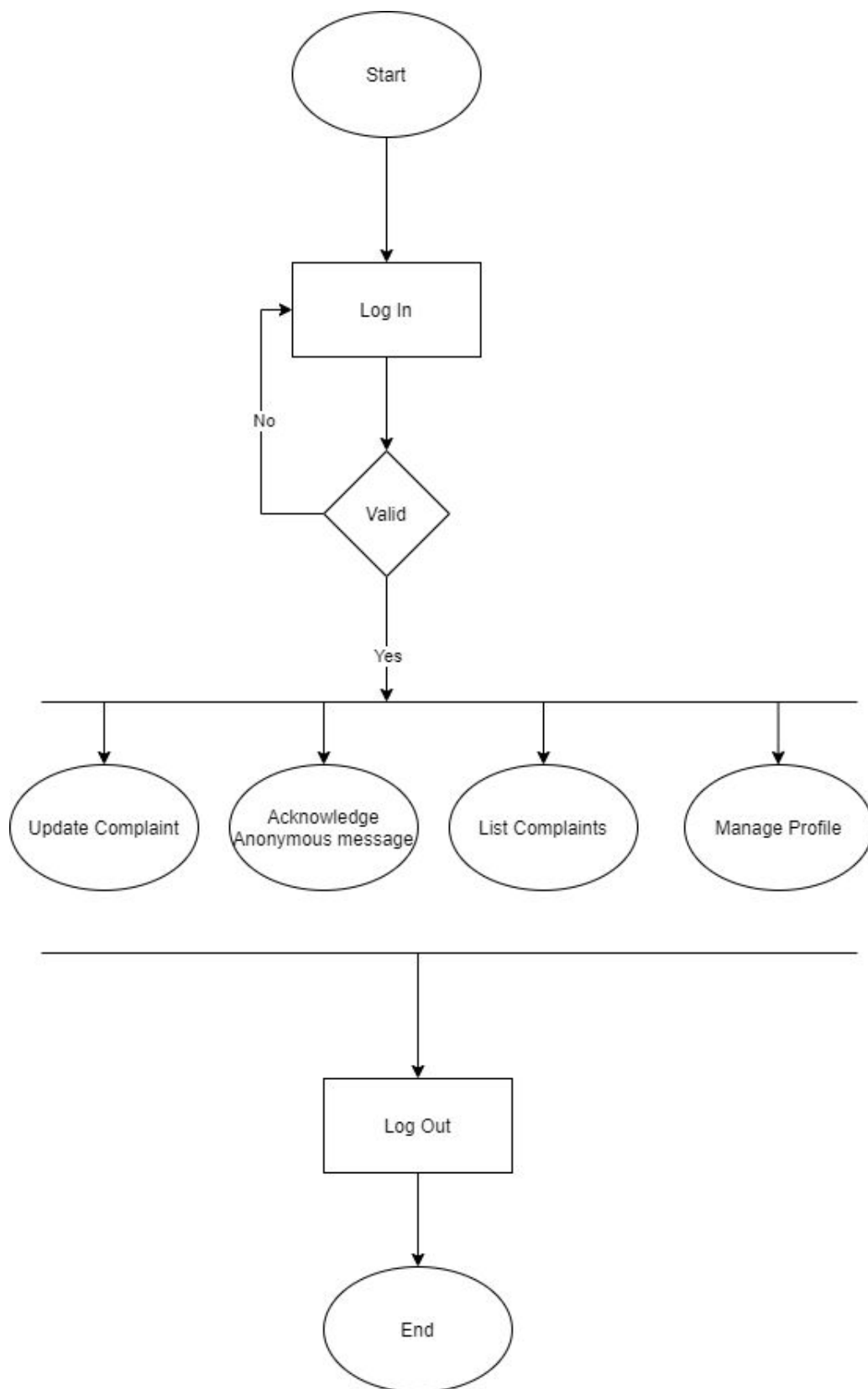
Goal	Allow the user to exit the system.
Pre-Conditions	Have a session established.
Triggers	The destruction of the established session.
Priority	High.
Description	1-The actor clicks on any link having for url: 00Logout.php 2-The system destroys the actor's session. 3-The actor is redirected to the Login Page.
Alternative	
Post-conditions	Terminates the session of the actor.

The Log Out function destroys the session established by the Log In function. And also exit the user from accessing the main components of the the system.

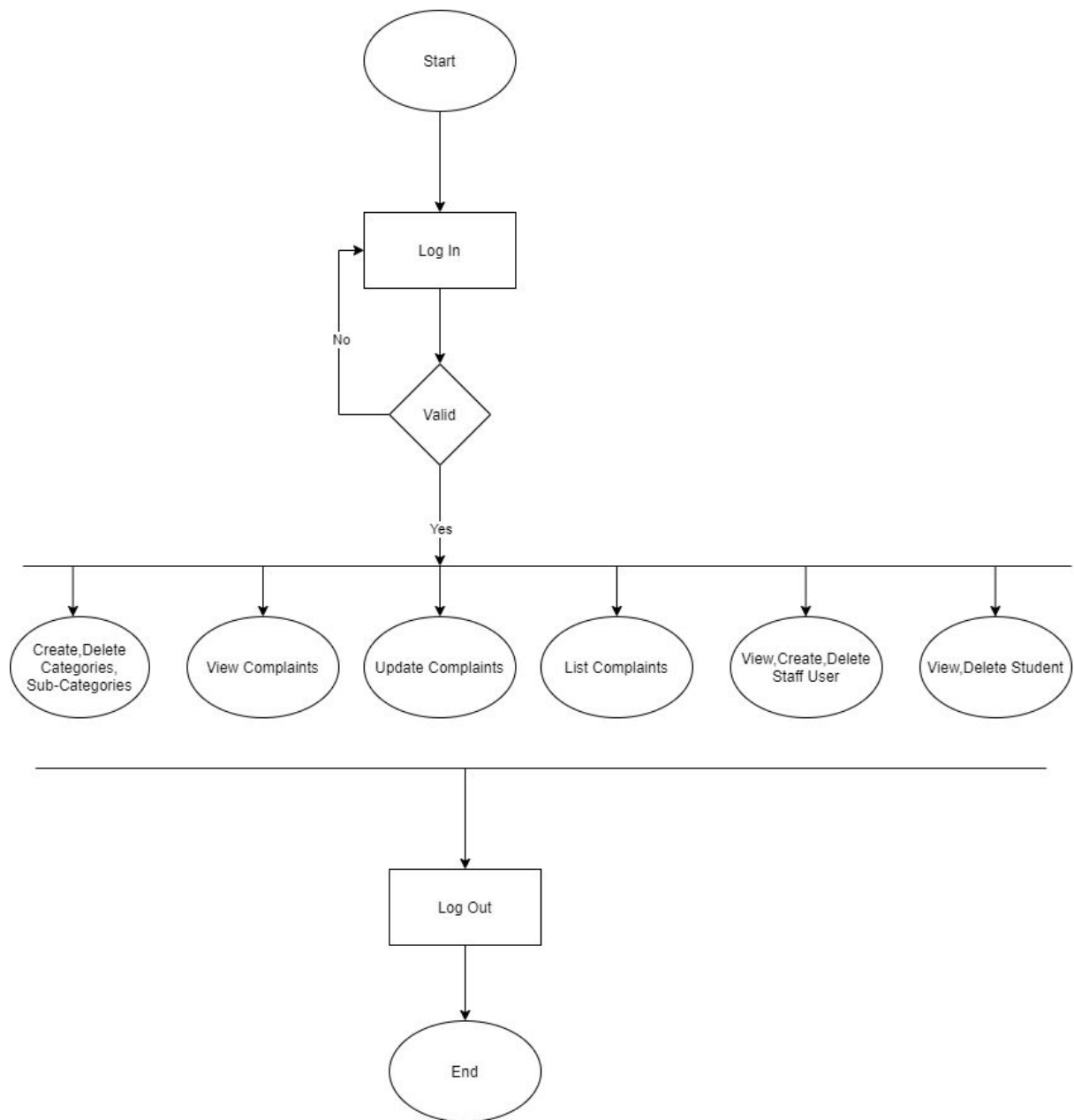
3.2 Activity Diagram



(Fig 3.1) Student Activity Diagram

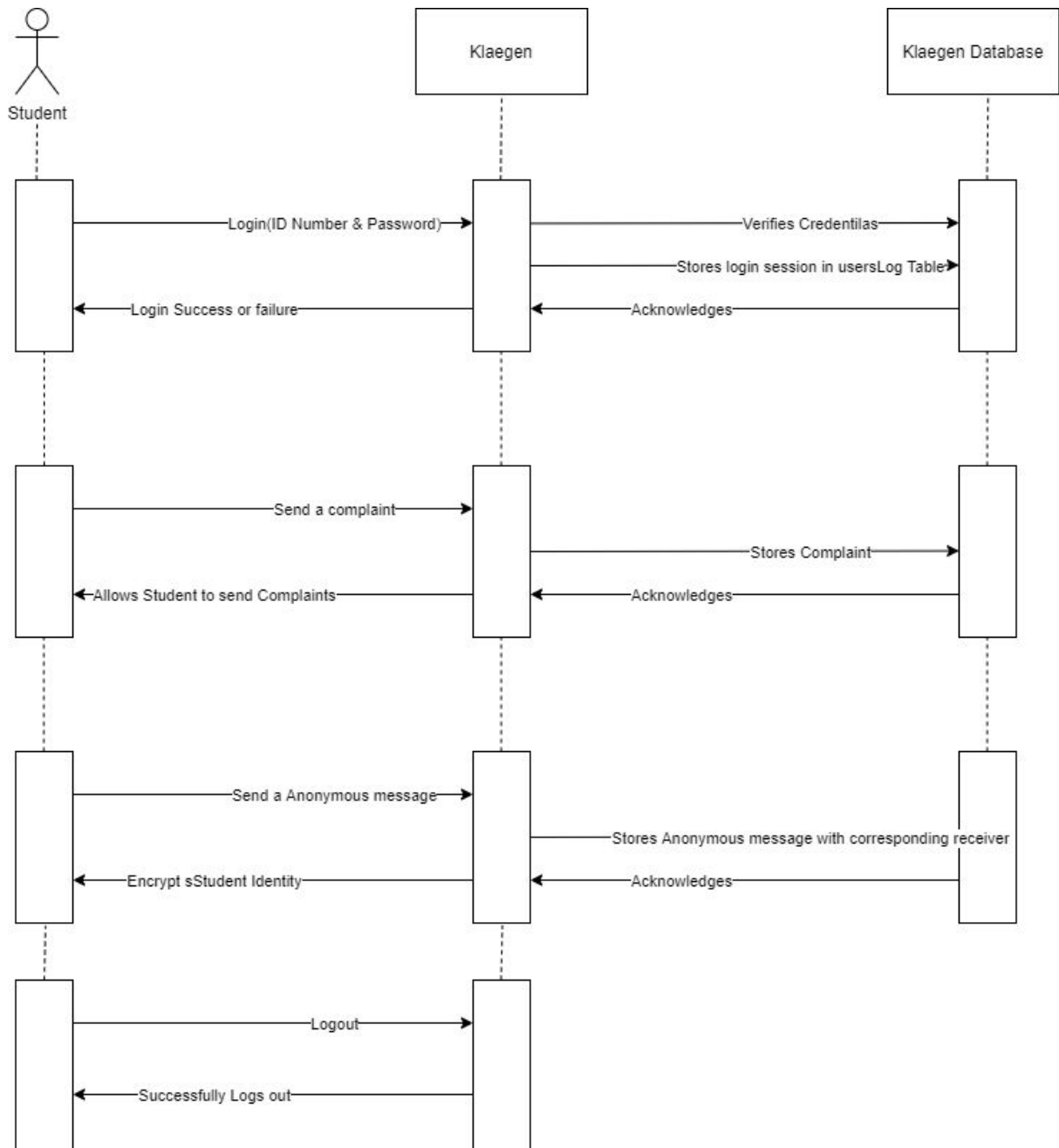


(Fig 3.2) Staff User Activity Diagram

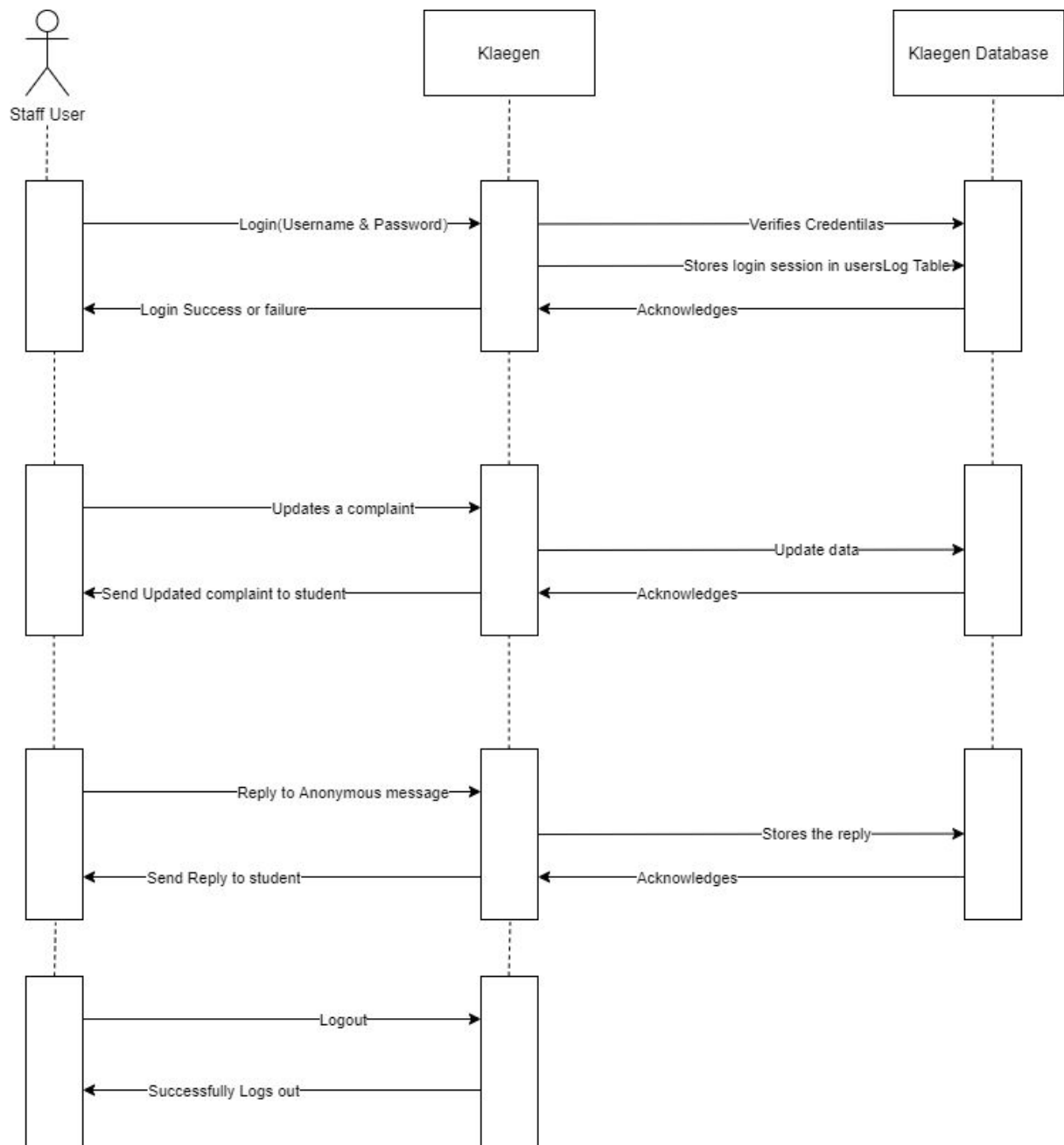


(Fig 3.4) Admin Activity Diagram

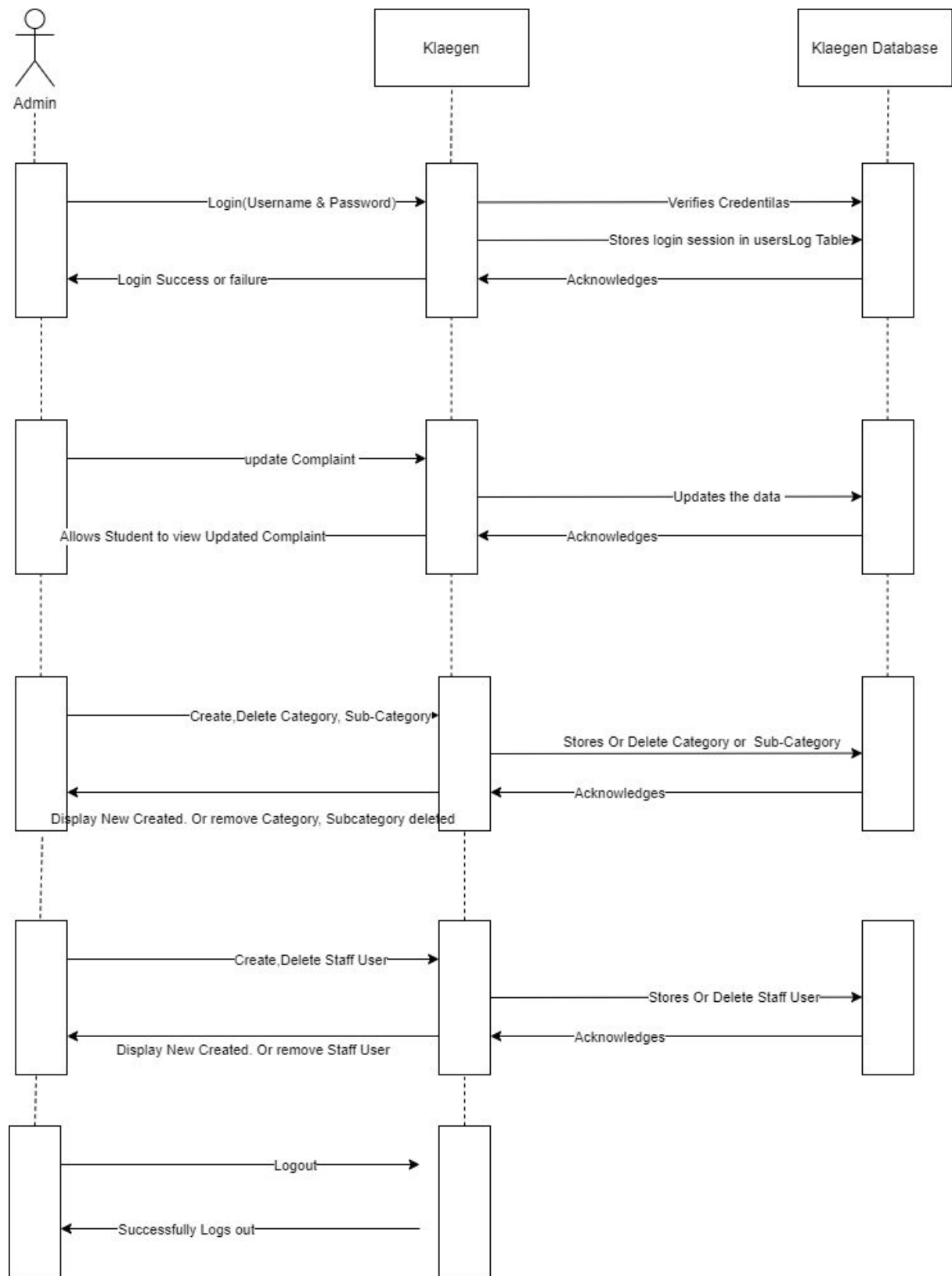
3.3 Sequence Diagram



(Fig 3.5) User activity Sequence Diagram



(Fig 3.6) Staff Activity Sequence Diagram



(Fig 3.7) Admin Activity Sequence Diagram

3.3 ER Diagram

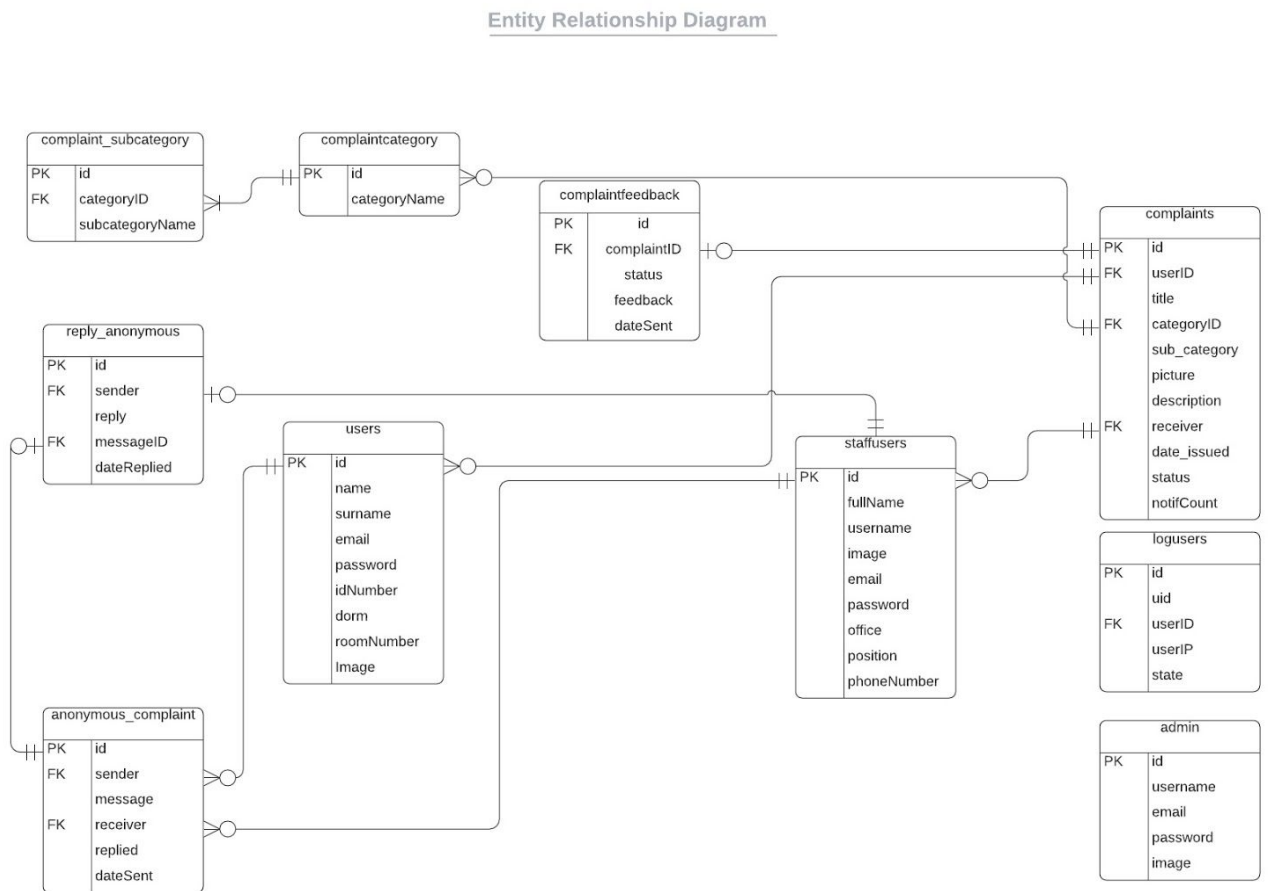


Fig 3.8) ER Diagram depicting the relationship that exists between between entities of the system.

CHAPTER 4- TESTING

Klaegen was first tested under unit testing. Meaning small component of the system were tested on their own to make sure they were doing what they were supposed to. After that, an implementation of module testing was necessary as those small components needed to work together without any issue.

Afterward Klaegen was tested under subsystem testing which put all the modules together and run the system in search for bugs and error to target which modules weren't compatible together and how to fix that.

The test showed to be positive by the end, but some minor bugs still need to be fixed such as sessions timeout issues and sessions notifications when adding or deleting a category. Overall the App does what it was intended to do (See Objectives).

4.1-Limitations

- The system is unable to redirect users on the page where they left off after a session timeout.
- The system doesn't give the ability to delete users anonymous messages yet.
- Unable to send a complaint to many staff users at once
- Only one reply can be assigned to a message(It's a limitation that was made on purpose)
- No real time message notification.

-Assign permission(s) to staff users is still under development.

CHAPTER 5- CONCLUSION AND RECOMMENDATION

After observation and studies of the current complaint process at AIU, the development of Klaegen was made possible to tackle all the issues students were facing. Though it is proven to do what it is supposed to do, Klaegen can still be improved in order to provide better service to students, as well as helping Asia Pacific International University. Perhaps it already provides a good foundation where students can express themselves and be understood.

Suggestion:

Klaegen needs to remain independent and needs to constantly be updated in terms of UI/UX and security. Strong moral and ethical value need to be taken into consideration when using the system, such as respecting the privacy of its users.

5.1 Update, Modification from project defense (as of 11 May 2020)

During the project defense of this system some recommendations and observations have been pointed out by the members of the defense council. Observations such as the user ID issue resetting to 0 for the registration of some new user. After investigation it was found that the issue was caused by a manual deletion of users from the database without truncating the table. This issue has now been fixed.

Also from the suggestions, what needs to be added to the system is the ability for a student to delete his complaint or anonymous message.

It was also mentioned that having a landing page for the system will make navigation easier. This issue has been solved and an index page is now available.

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