SECP2523: DATABASE

<SEMESTER 1 2020/2021>

DATABASE DESIGN DESCRIPTIONS: CONCEPTUAL DATABASE DESIGN FOR SPACE SYSTEM MANAGEMENT

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Stakeholder: KOLEJ VOKASIONAL PERDAGANGAN JOHOR BAHRU

Pn Mastura Md Hassan	**15 December 2020**

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1.0 INTRODUCTION

1.1 Overview about the company

The purpose is to create a new system from the current system that is being used by Kolej Vokasional Perdagangan Johor Bahru. The client representative is Puan Mastura Binti Md Hassan. This new system is similar to the computerized system which is more efficient in record-keeping for staff use. Furthermore, the system is invented to avoid human error. With the built-in database (database user, asset, complaint), the record of complaints from users input can be taken far more quickly compared to manual processing. Users now can easily see the result of the data which is the compilation of complaints in the system. Especially for admin, they can review the data faster if they have any inquiries and to do some actions. The system goals are to satisfy client requirements and be able to solve the client's problems. Thus, the system will be more functional , reliable and more user friendly. In this system, there are 4 types of users that will be explained briefly in the next section.

1.2 Problems

The **current system** being used by the client is a paper document filing system where the Lab PIC should fill in the form in order to make a complaint on certain issues that occur in their room. However, according to the client's representative, nowadays most of the PIC of the room will fill in the complaint form by using google form where the admin will collect the complaints data from both platforms and merge it into one spreadsheet. There are several **problems** that have been faced by the client as they don't have an automated system (electronic filing) that will be proposed in this project. First and foremost, the current system lacks security. Paper document filing can be less secure than electronic filing systems since misplaced documents can easily be placed in the wrong hands.

Moving on to the next issue where their current system used poorly designed data management to keep all of their user information and the complaint's record since they're using a spreadsheet. A spreadsheet seems to have several consequences such as lack of accessibility and speed, did not follow the standardized integrity rules and high risk of data redundancy. On the other hand, using a spreadsheet is very risky for misinterpretation to occur between the PICs and the assistants. This is because the entries are being conducted by humans where there is always room for misunderstanding. Everyone's mind thinks differently and understands things in different ways and the same goes for data entry.

Next, the current system takes up a lot of space. As a famous organization with a large number of employees, manual document filing might take up rooms just to fit the files in and may take up a lot of space to save the data in several hard disks. This also one of the consequences where the user should hunt down a file that piled up with another thousands of files. This is just one big headache that a user doesn't need. It interrupts the organization's productivity levels since the system is conducted by humans.

Last but not least, it's hard for the user to make any changes especially for the PIC on a certain room in undertaking the data entry process. For example, if the PIC has already made a complaint by using the paper filing system and he/she has to make a correction on the complaint, he/she has to fill another form in order to correct any of the mistakes that has been made. And this problem could affect the assistant technician and engineers since the complaints that they had will be doubled than the real value. Thus, it will create a confusion amongst them while doing the repairing task

1.3 Proposal

The system that we will be inventing is a system that could help to ease the client in managing especially the complaints and the user. The system consists of 4 users which are Admin, room PICs , Technician Assistant and Engineer Assistant.

The first function that will be included in the system is the **login and logout** function where every user (admin, PIC, Technician Assistant and Engineer Assistant) are able to perform or use the function. Next function is to **manage complaints** where every user (admin, room PICs, Technician Assistant and Engineer Assistant) also can perform this function however each one of them has their boundaries in this function. For example, PIC who will produce the report complaints while Technician Assistant and Engineer Assistant update the status of the complaints in one function instead of updating their work progress in a log book.

In addition, **managing user** functions also will be included in order to facilitate the admin task where admin will create the staff profile that consists of room PICs, assistant technicians, assistant engineers and the admin itself. Admin will also remove the lab PIC incase of the room PICs were transferred to another place or have retired or any other cases. On the other hand, the user such as room PICs, Technician Assistant and Engineer Assistant are able to edit their profile by undergoing the **manage profile** function just in case the user might want or need to change their profile details or password.

Moreover, admins are able to undergo the **manage assets** which is a centralized system that allows the admin of the organization to track important details about each asset in real time. This decreases administrative costs, improves service and gives the client organization greater visibility into asset utilization, costs and maintenance.

Finally yet importantly, the dashboard where it will be displayed on the main page of each user consist of their position, room and name. The dashboard helps the user to perform their task easily without wasting their time to find their task since each of the users (admin, room PICs, assistant technician and assistant engineer) will have different types of dashboard.

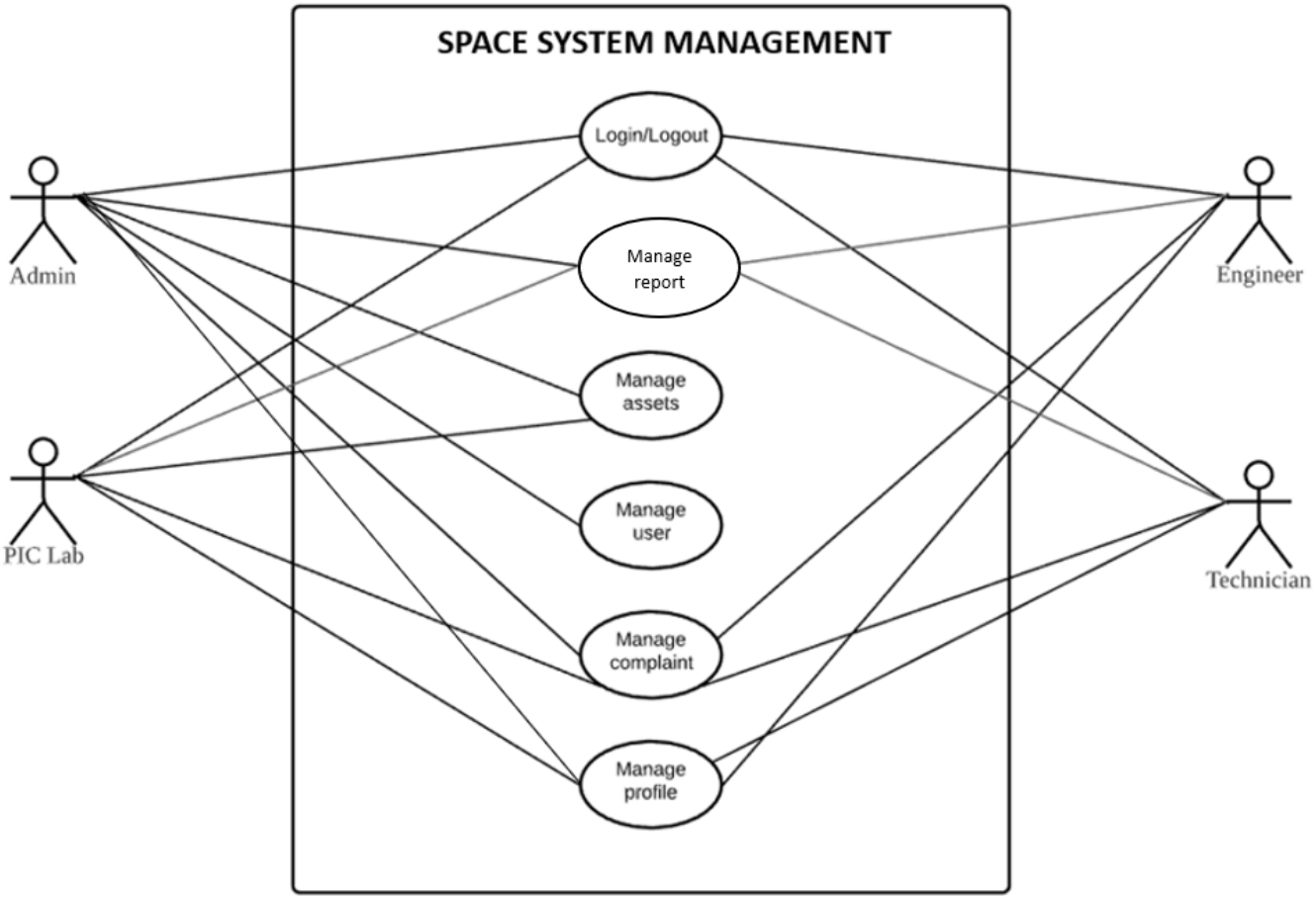
1.4 Definitions, Acronyms and Abbreviations

No.	Acronyms	Definitions
1	PIC	Person In Charge of a lab
2	ICT	Information and communication technology
3	CRUD	Create,Read, Update and Delete

2.0 DATABASE SYSTEM REQUIREMENT

2.1 System Overview

The system that we were about to develop is a space management system. This system is mainly **to help the user to easily insert complaints regarding any damages on the assets** and keep all of the data in a well-designed database.



2.2 Module <login/logout>

AZRIANA BINTI ZAINAL ABIDIN (A19EC0027)

2.2.1 Module Description

This module is for every user. They must use this module(login) to enter the system. When they **enter their username** or **password** wrongly, they cannot enter the system. Users also can **click on "Forgot Password"** if they cannot remember their password. Other than that for this module(logout), every user will **click on the logout button** when they want to end their session in the system.

2.2.2 Transaction Requirement: Data Entry

- **2.2.2a** Enter username and password to login into the system
- **2.2.2b** Enter forgot password to get new password

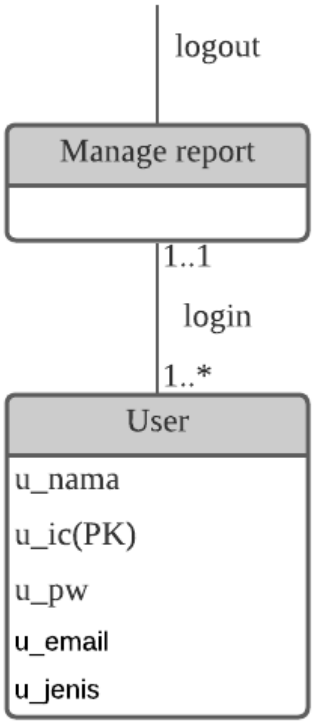
2.2.3 Transaction Requirement: Data Update/Deletion

- **2.2.3 a** Update details of new password if forgot password

2.2.4 Transaction Requirement: Data Queries

- **2.2.4 a** List username of every user(Admin, Pic, Technician Assistant, Engineer Assistant)
- **2.2.4 b** List password of every user(Admin, Pic, Technician Assistant, Engineer Assistant)

2.2.5 Local Data Model (ERD) for Module 1



2.3 Module <manage report>

AZRIANA BINTI ZAINAL ABIDIN (A19EC0027)

2.3.1 Module Description

This module is for every user. Every user has a managed report because it is **different based on their position. Admin** can see everything in their dashboard such as list of pic, list of technician assistant, list of engineer assistant. **Admin** can control everything in the dashboard while **PIC, a Technician Assistant and Engineer Assistant** can manage complaints and edit their profile. Although they have the **same function but their interface will be slightly different** from others. When these users login into the system, their position will appear in each dashboard interface(top left).

2.3.2 Transaction Requirement: Data Entry

- No transaction for data entry/data input

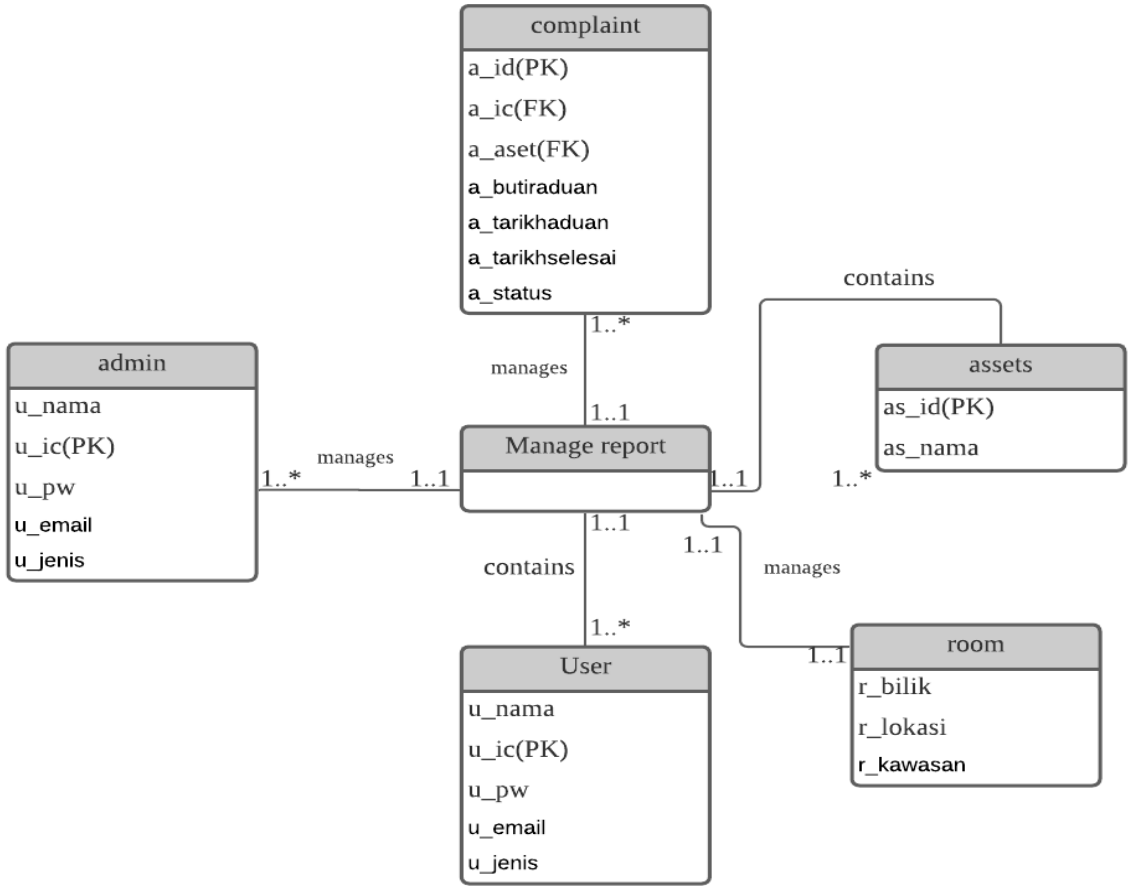
2.3.3 Transaction Requirement: Data Update/Deletion

- No transaction for update/ delete data.

2.3.4 Transaction Requirement: Data Queries

- List of every function that **Admin** can do.
- List of every function that **PIC** can do.
- List of every function that a **Technician Assistant** can do.
- List of every function that an **Engineer Assistant** can do.

2.3.5 Local Data Model (ERD) for Module 2



2.4 Module <manage assets>

Nur Hadirah Munawarah Binti Rozmizan (A19EC0201)

2.4.1 Module Description

This module is specified for **admin and PIC makmal**.The function is **add, modify and delete** assets from **admin and PIC lab**. There are several assets such as doors, windows, computers depending on what asset needs to be fixed. The **assets** are also **different** in the view of Technician assistant and engineer assistant. Take for example, a technician assistant can view only the assets of **ICT** assets such as computers, lcd projector and so on.Meanwhile, an engineer assistant can only view **non-ICT** assets such as doors, lamps and so on. In the admin side, if the admin wants to add the asset, they can just choose the drop down options and click add. However, if they spot an error and want to modify the mistake, they can just click modify and edit the asset again. Lastly, they also are able to delete the asset if the complaint gets cancelled.

2.4.2 Transaction Requirement: Data Entry

- **2.4.2.a** Enter the details of asset (such as '*Lampu*') to be added
- **2.4.2.b** Enter the location of asset

2.4.3 Transaction Requirement: Data Update/Deletion

- **2.4.3.a** Update/delete the details of an asset.

2.4.4 Transaction Requirement: Data Queries

- **2.4.4.a** List details of assets from **Technician Assistant view.**
- **2.4.4.b** List details of assets from **Engineer Assistant view.**
- **2.4.4.c** List all the details of assets from **PIC**'s page
- **2.4.4.d** List all the details of assets from **admin**'s page

2.4.5 Local Data Model (ERD) for Module 3

2.5 Module <manage user>

Nur Aleeya Syakila Binti Muhamad Subian (A19EC0127)

2.5.1 Module Description

This module is specifically for admin. Admin can use this module to easily manage all of the users including admin itself ,PIC, Technician Assistant and Engineer Assistant. Admin will be the one who will **add** a user in the system, **specify** the user type (admin,PIC, Technician Assistant and Engineer Assistant), remove any user (if cases like a PIC no longer work there).

2.5.2 Transaction Requirement: Data Entry

- **2.5.2 a** Enter the details of new user that is to be added
- **2.5.2.b** Enter PIC's room

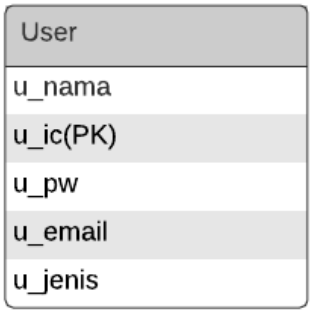
2.5.3 Transaction Requirement: Data Update/Deletion

- **2.5.3 a** Update/delete the details of PIC
- **2.5.3 b** Update/delete the details of Technician Assistant
- **2.5.3 c** Update/delete the details of Engineer Assistant

2.5.4 Transaction Requirement: Data Queries

- **2.5.4 a** List details of PIC
- **2.5.4 b** List details of Technician Assistant
- **2.5.4 c** List details of Engineer Assistant
- **2.5.4 d** Produce list of all user details

2.5.5 Local Data Model (ERD) for Module 4



2.6 Module Manage Complaint

Nor Hafiyzha Binti Md Husni

2.6.1 Module Description

It provides the complaint report form for the PIC to report some complaints that will be sent to Assistant Technician or Assistant Engineer for further actions and divided into 2 types of assets which are ICT and non-ICT assets. It also covers all room or space in the organization.

2.6.2 Transaction Requirement: Data Entry

- **2.6.2.a** Enter the PIC's name.
- **2.6.2.b** Enter the details of a complaint

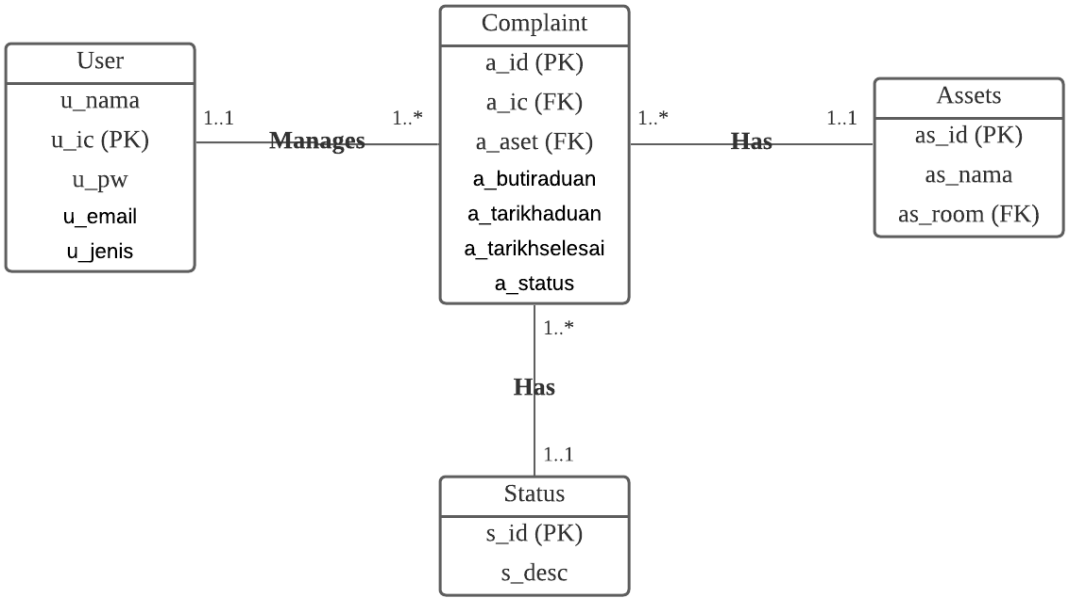
2.6.3 Transaction Requirement: Data Update/Deletion

- **2.6.3.a** Update/delete the details of a complaint.
- **2.6.3.b** Update the status of a complaint.

2.6.4 Transaction Requirement: Data Queries

- **2.6.4.a** List details of all PICs alphabetically by name in the organization.
- **2.6.4.b** List details of a complaint (including date, room name, room's location, complaint's description)
- **2.6.4.c** Identify types of assets (ICT or non-ICT)
- **2.6.4.d** Display the details of a complaint
- **2.6.4.e** Produce a list of all complaints

2.6.5 Local Data Model (ERD) for Module 5



2.7 Module <manage profile>

Nur Aleeya Syakila Binti Muhamad Subian (A19EC0127)

2.7.1 Module Description

This module is accessible for all users including admin, PIC, Technician Assistant and Engineer Assistant. This module is to make sure that all users can edit their profile in cases of if there's changes in their details such as password or email etc.

2.7.2 Transaction Requirement: Data Entry

- **2.7.2 a** Enter new password *
- **2.7.2 b** Enter new email

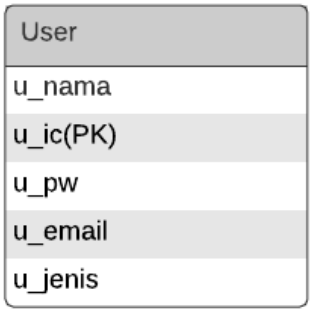
2.7.3 Transaction Requirement: Data Update/Deletion

- **2.7.3 a** Update/delete current password
- **2.7.3 b** Update/delete current information

2.7.4 Transaction Requirement: Data Queries

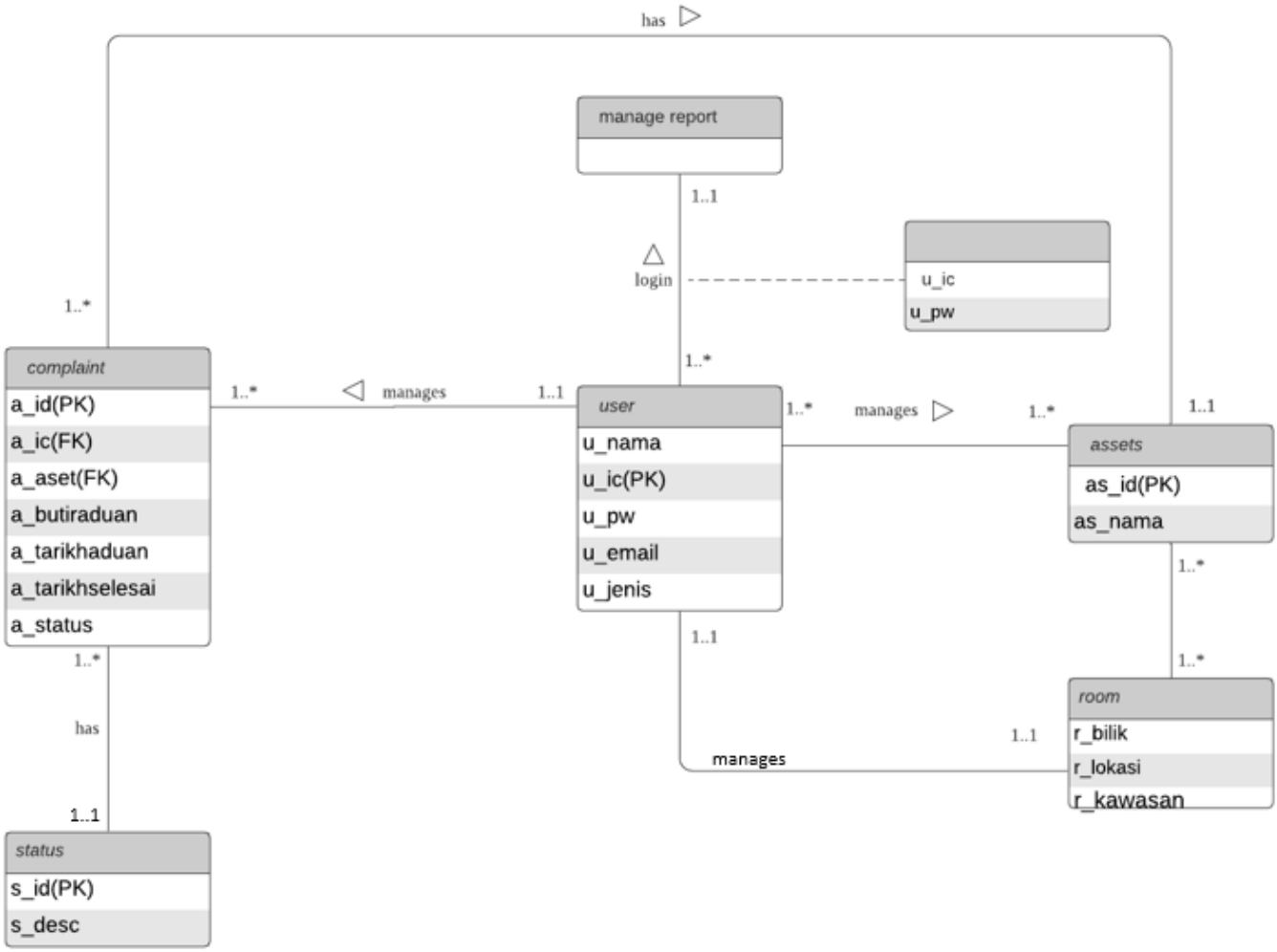
- **2.7.4 a** List the profile details

2.7.5 Local Data Model (ERD) for Module 6

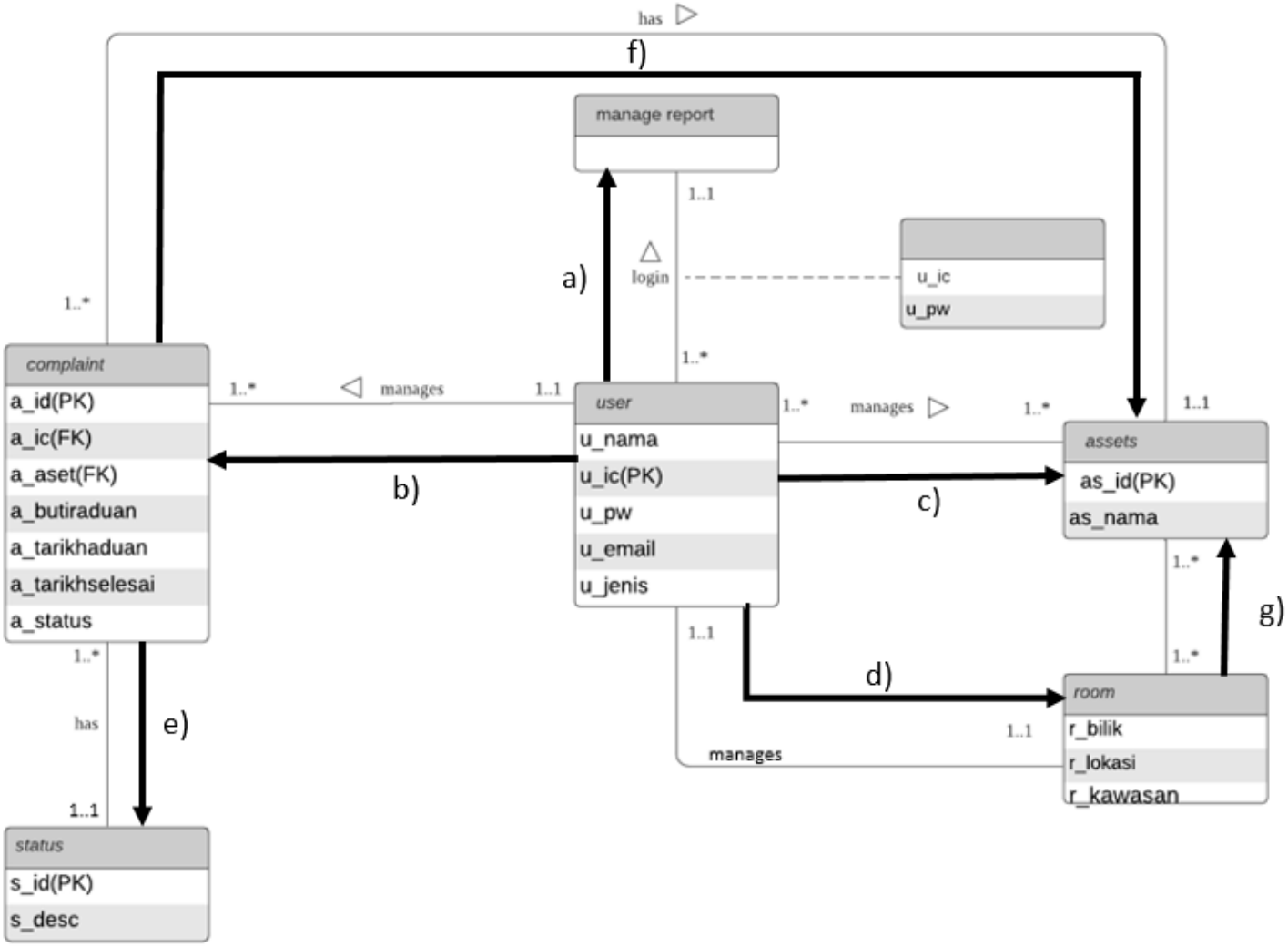


3.0 GLOBAL CONCEPTUAL DATA MODEL (GLOBAL ERD)

3.1 Global Conceptual Design (ERD)



3.2 Verified Global Conceptual Design (Verified ERD)



Symbol	Transaction
a)	**2.2.2a, 2.2.2b,2.2.3 a, 2.2.4 a, 2.2.4 b**
b)	**2.6.2.a, 2.6.2.b, 2.6.3.a, 2.6.4.a, 2.6.4.b,2.6.4.c**
c)	**2.4.2.a, 2.4.3.a, 2.4.4.a, 2.4.4.b, 2.4.4.c, 2.4.4.d**
d)	**2.5.2.b**
e)	**2.6.3.b**
f)	**2.6.4.c**
g)	**2.4.2.b**

Table 1 - Verified ERD transactions

3.3 Data Dictionary

3.3.1 Data Dictionary - identify entities

Entity name	Description	Aliases	Occurrence
Manage report	General term describing dashboard	Control panel	Each report differs with one another based on the type of user.s
User	General term describing all users exist in the system	End user	Each user has access to the same system but differs in activity.
Complaint	General term describing all complaints	Issue	Each complaint is managed by the user.
Asset	General term describing all the assets	Inventory	Each asset is managed by the users.
Status	General term describing all the status	Condition	Each complaint has a status.

3.3.1 Data Dictionary - identify relationship type

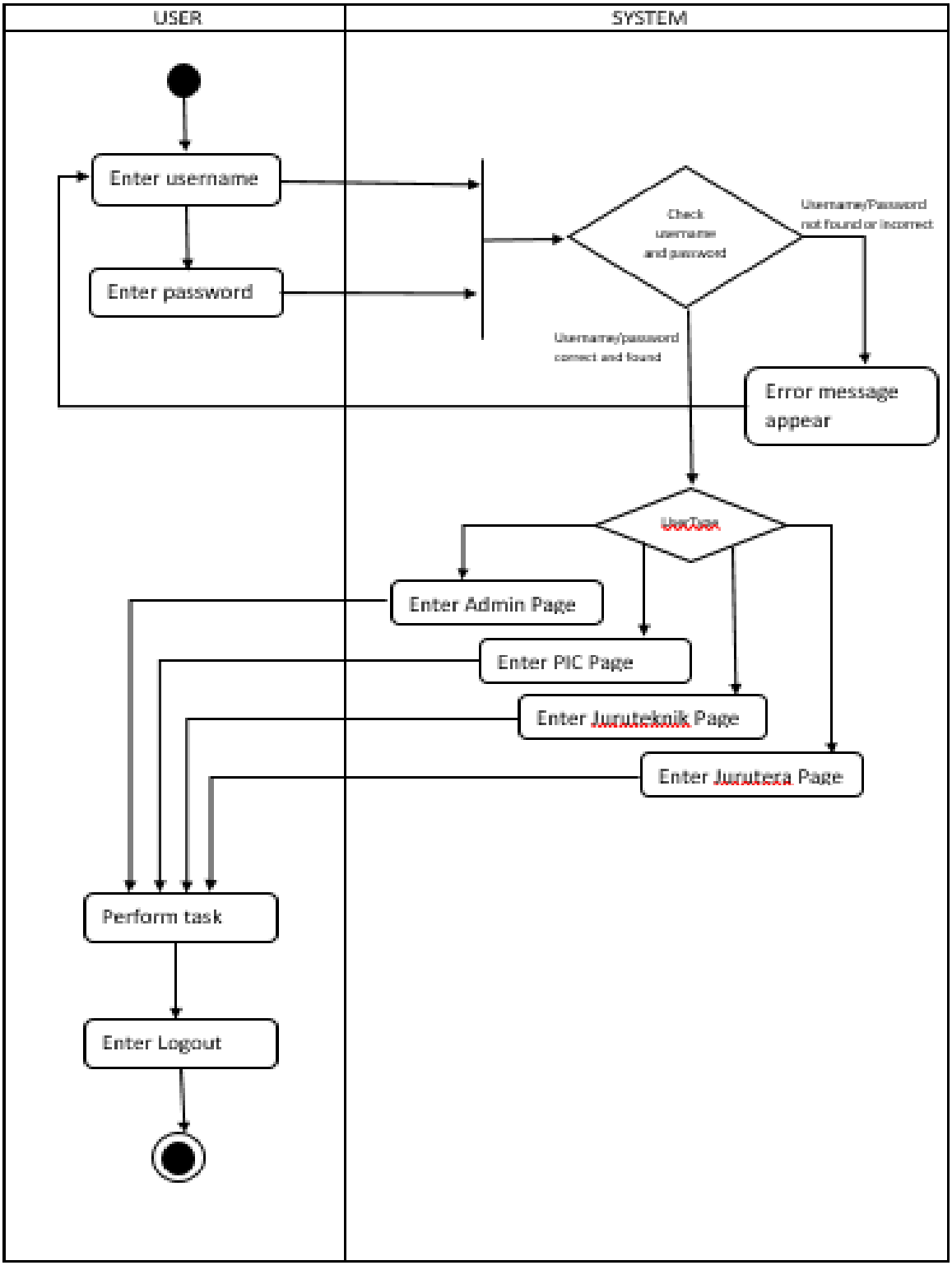
Entity Name	Multiplicity	Relationship	Entity Name	Multiplicity
	1..1	accesby	user	1..*
User	1..* 1..* 1..1 1..1	accesses manages makes manages	dashboard assets complaint user	1..1 1..* 1..* 1..*
Complaint	1..1 1..1	has has	status assets	1..* 1..1
Asset	1..*	manageby	user	1..*
Status	1..*	has	complaints	1..1

3.3.2 Data Dictionary - Description of attributes

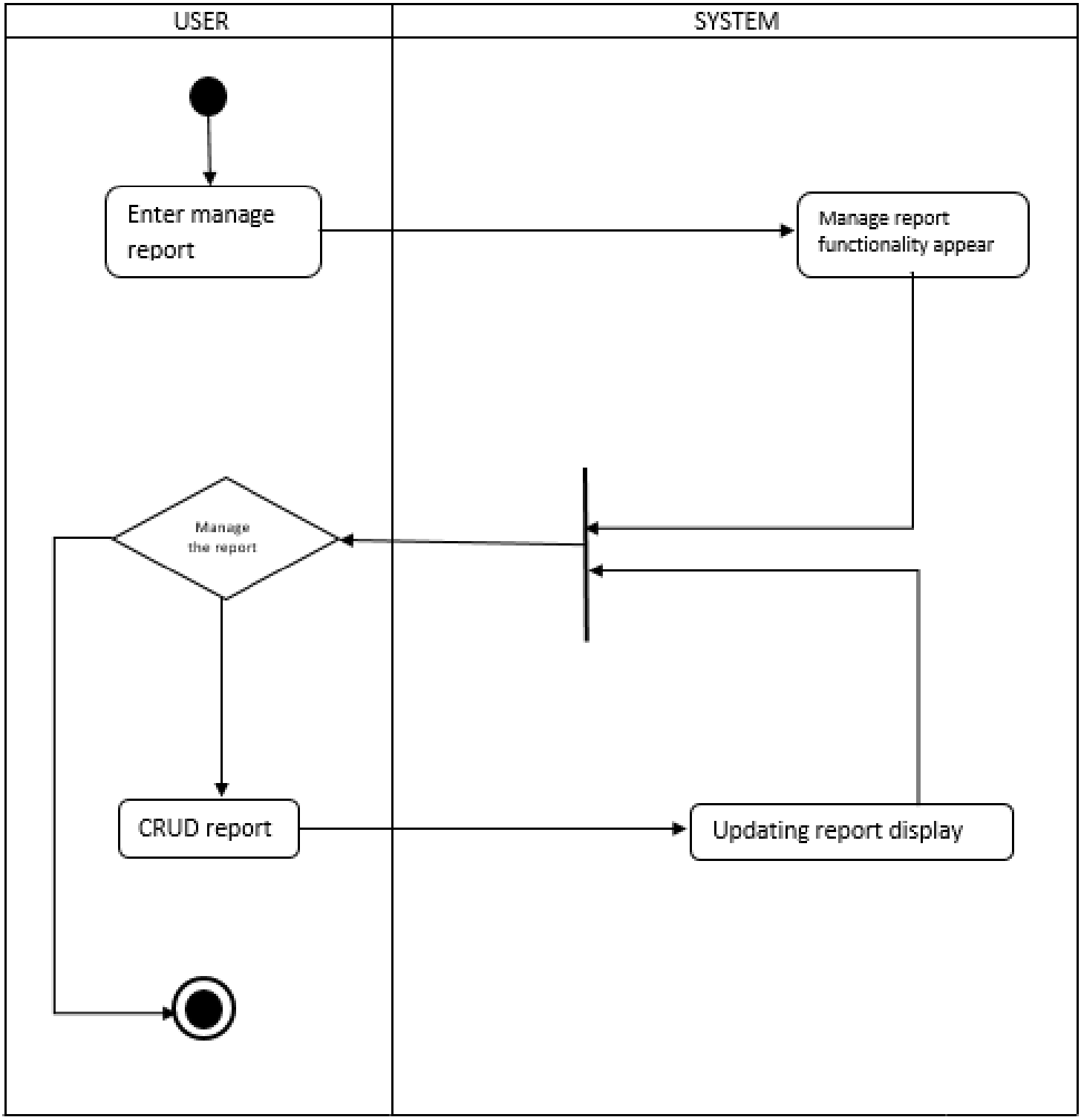
Entity Name	Attributes	Description	Data Type and Length	Nulls	Multi-valued
User	u_nama	Unique identifies a member of user	50 variable character		No
	u_ic	Ic number of user	15 variable character		No
	u_pw	Password of user	20 variable character		No
	u_email	Email of user	50 variable character		No
	u_jenis	Type of user	15 variable character		No
	u_makmal	Lab	50 variable character	NULL	No
Complaints	a_id	Unique identifiers to identify complaint	50 integer		No
	a_ic	Ic number of user	15 variable character		No
	a_aset	Inventory of complaint	50 variable character		No
	a_butiraduan	Details of complaint	30 integer		No
	a_tarikhaduan	Date of complaint	date		No
	a_tarikhselesai	Completed date of complaint	date	NULL	No
	a_kawasan	Location of complaint(kolej/asrama)	10 variable character		No
	a_lokasi	Location of complaint	30 variable character		No
	a_status	Status of complaint	2 integer		No
Status	s_id	Unique identifiers of status id	2 integer		No
	s_desc	Description of status	20 variable character		No
Asset	as_id	Unique identifier to identify asset	50 variable character		No
	as_nama	Name of inventory(aset)	50 variable character		No

4.0 APPENDICES

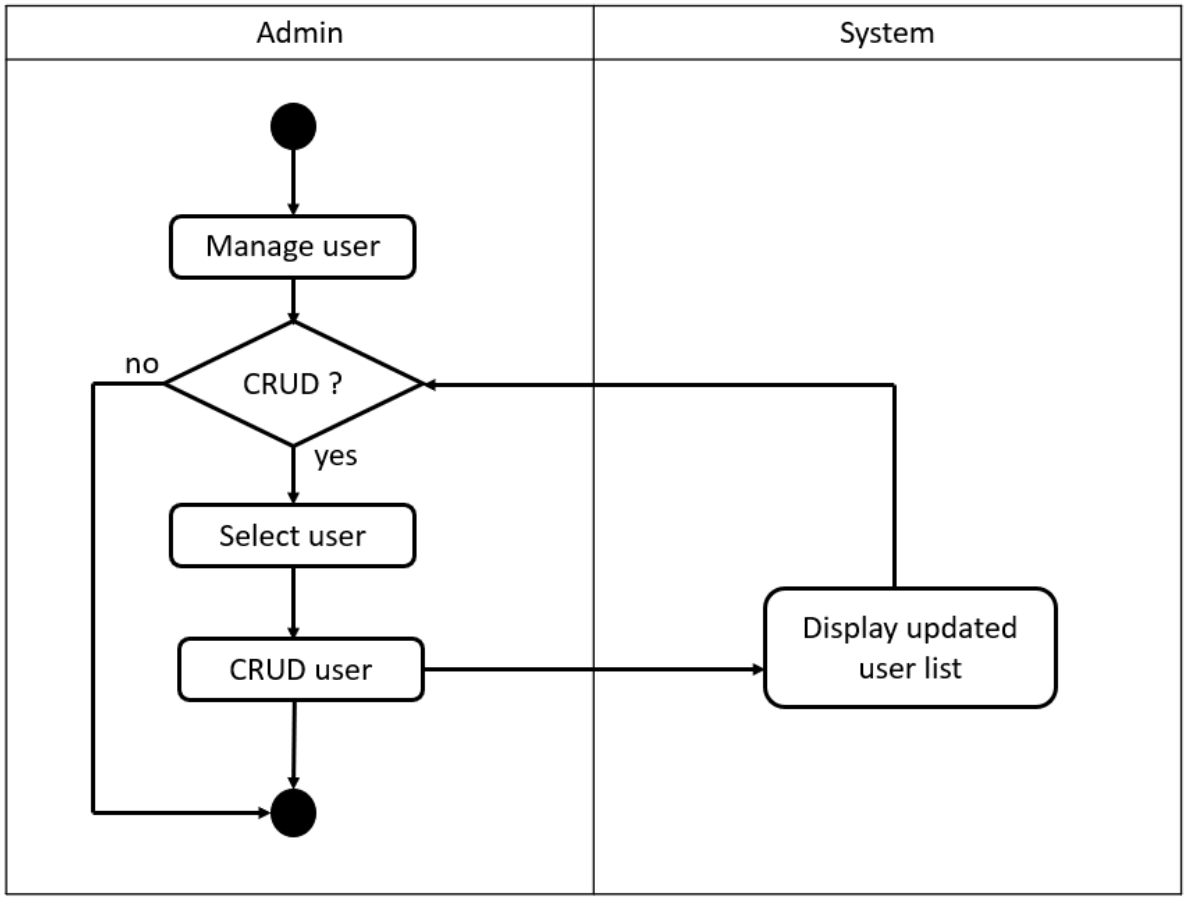
4.1 Activity Diagrams for every module (login/logout)



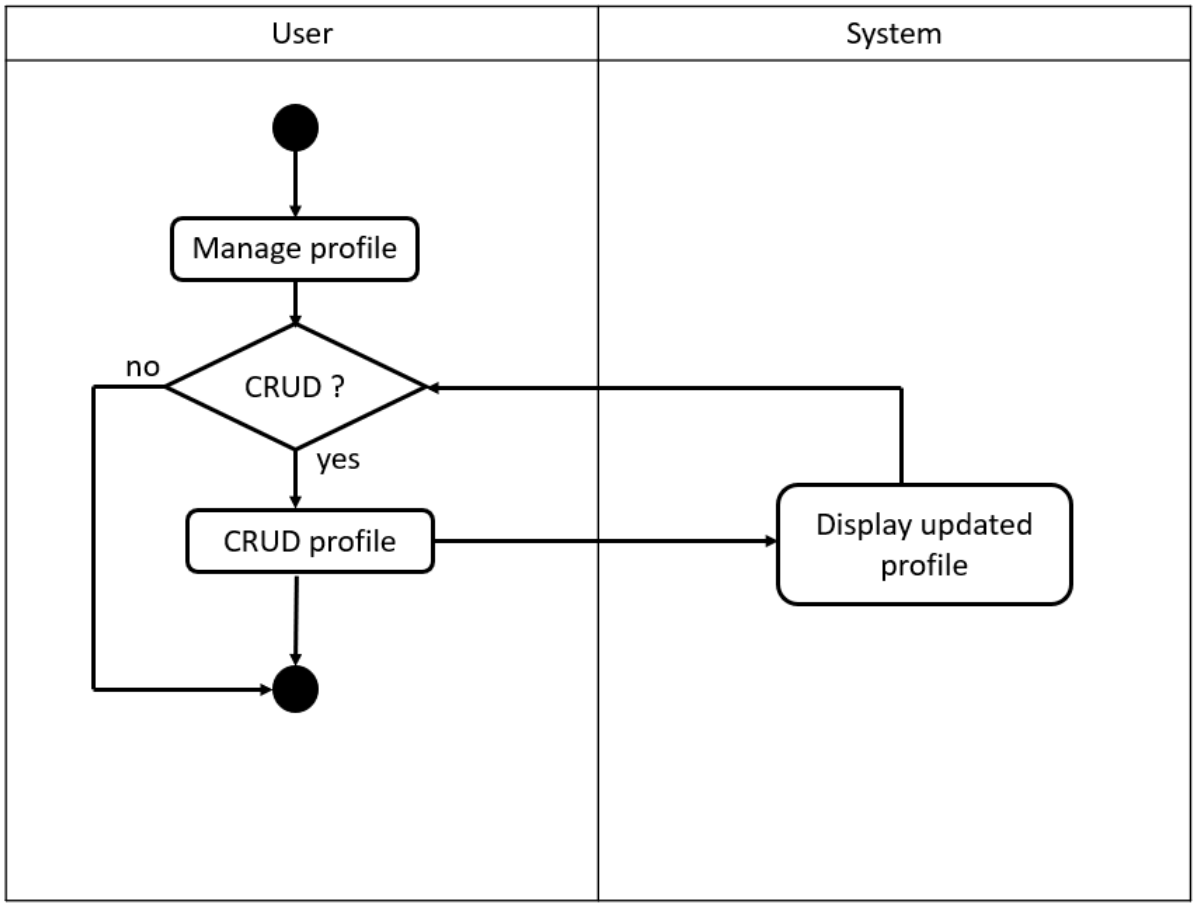
Activity Diagram (dashboard)



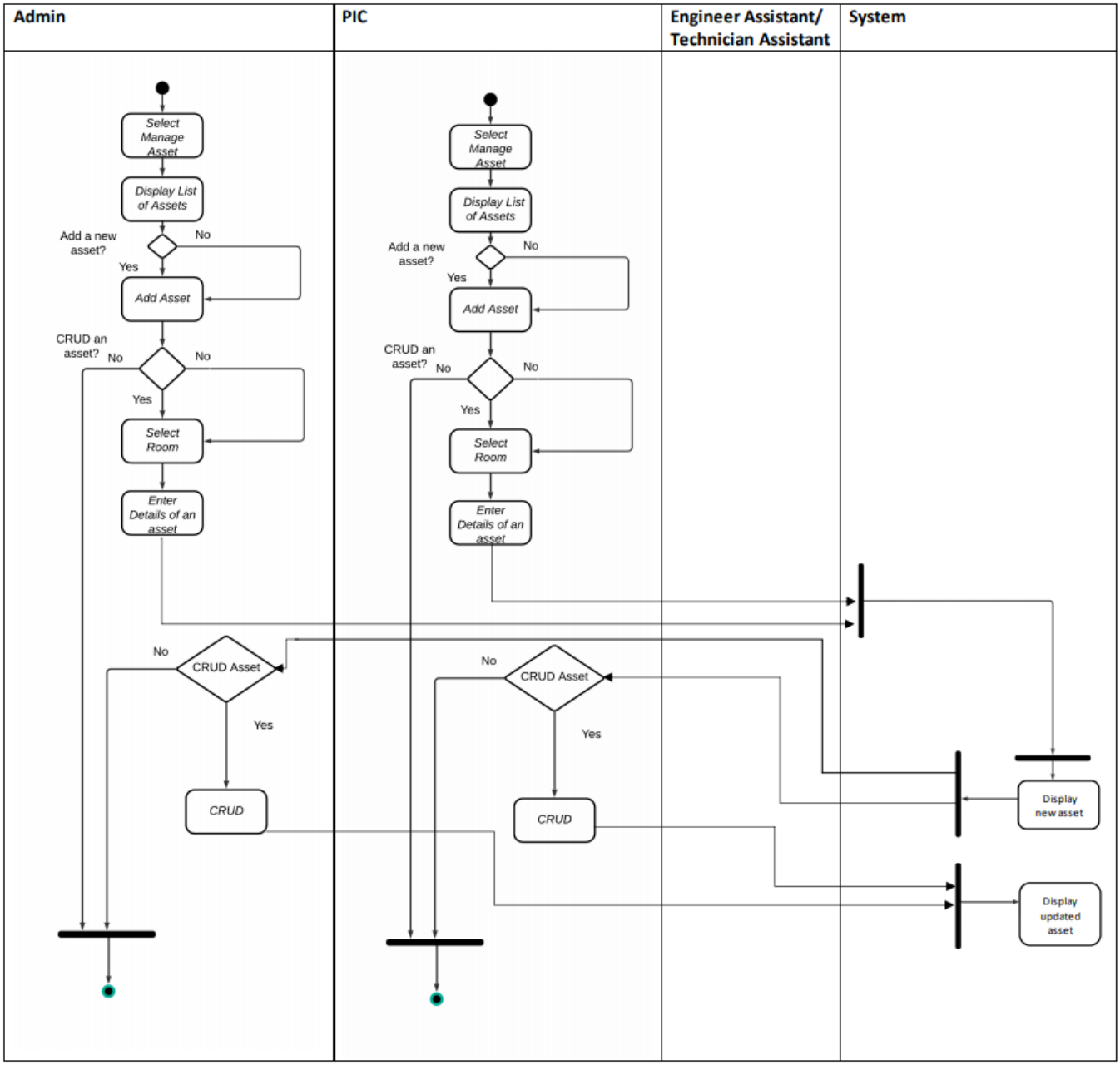
Activity Diagram (manage user)



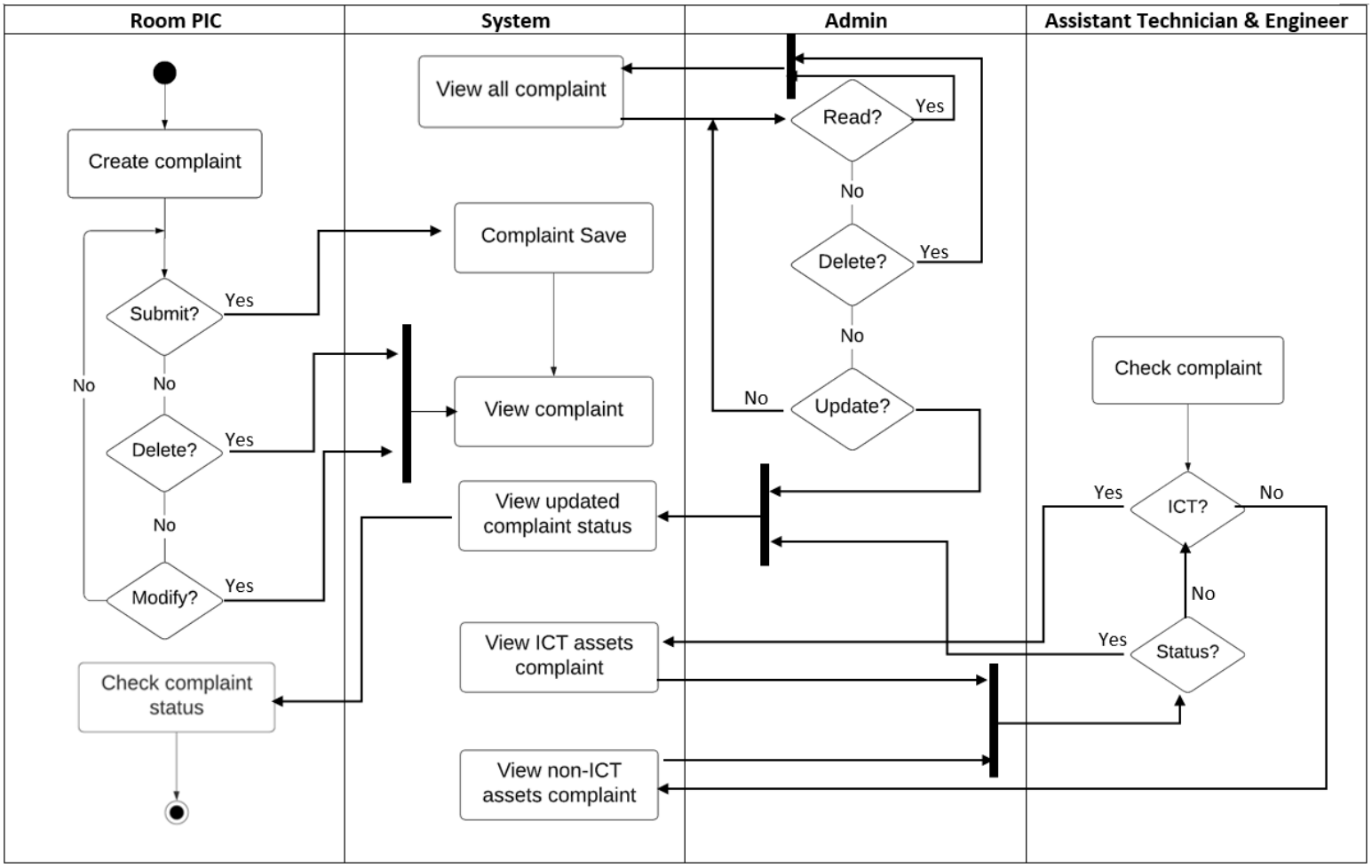
Activity Diagram (manage profile)



Activity Diagram (manage asset)



Activity Diagram (manage complaint)



4.2 Use Case Description for every module

4.2.1 Login/Logout

Use Case Name	**Login**
Use Case Description	User login to system to access the functionality of the system
Actors	Admin,Lab PIC ,Technician Assistant, Engineer Assistant
Pre-Condition	System must be connect to the network
Post-Condition	After a successful login user can enter the system

Main Scenarios	**Serial No**	**Steps**
Actors/User	1	Enter username Enter password
	2	Validate username Validate password
	3	Allow access to system
Extension	1a	Invalid username System shows an error message
	2b	Invalid password System shows an error message
	3c	Cannot access system Click Forgot Password

4.2.2 Dashboard

Use Case Name	Dashboard
Use Case Description	User enter dashboard to access functionality
Actors	Admin,Lab PIC ,Technician Assistant, Engineer Assistant
Pre-Condition	User must successfully login
Post-Condition	After a successful enter dashboard user can choose system functionality

Main Scenarios	Serial No	Steps
Actors/User	1	Enter dashboard
	2	Choose functionality
Extension	1a	Unsuccessfully enter dashboard
	2b	Cannot access system

4.2.3 Manage asset

Use Case Name	**Manage asset**
Use Case Description	A user click the manage asset to access the functionality of the system
Actors	Admin,Lab PIC ,Technician Assistant, Engineer Assistant
Pre-Condition	**Only** admin and PIC can use this function(CRUD), Engineer Assistant and Technician Engineer can only **view** the asset
Post-Condition	After a successful add/CRUD , a list of completed asset is displayed

Main Scenarios	**Serial No**	**Steps**
Actors/Users	1	Click manage asset
	2	CRUD asset
	3	Validate asset
	4	Updated asset
Extensions	1a	Unsuccessfully access to manage asset
	2b	Page exits

4.2.4 Manage profile

Use case name	**Manage profile**
Use case description	Users can create, read, update, delete their profile
Actors	Admin, Lab PIC ,Technician Assistant, Engineer Assistant
Pre-condition	User has successfully entered dashboard
Post-condition	Users will see their updated profile

Main Scenarios	**Serial No**	**Steps**
Actors/User	1	Edit information
	2	Updated profile
Extensions	1a	Profile can’t be edited because of redundancy data
	2b	Profile failed to update

4.2.5 Manage User

Use case name	**Manage user**
Use case description	User manage other users
Actors	Admin, Lab PIC ,Technician Assistant, Engineer Assistant
Pre-condition	Only admin will be able to do this use case
Post-condition	Only admin will see a list of all users

Main Scenarios	**Serial No**	**Steps**
Actors/User	1	Add/remove user
	2	Validate user
	3	Updated user list
Extensions	1a	User can’t be added because redundancy of data
	2b	Invalid user
	3c	List not updated

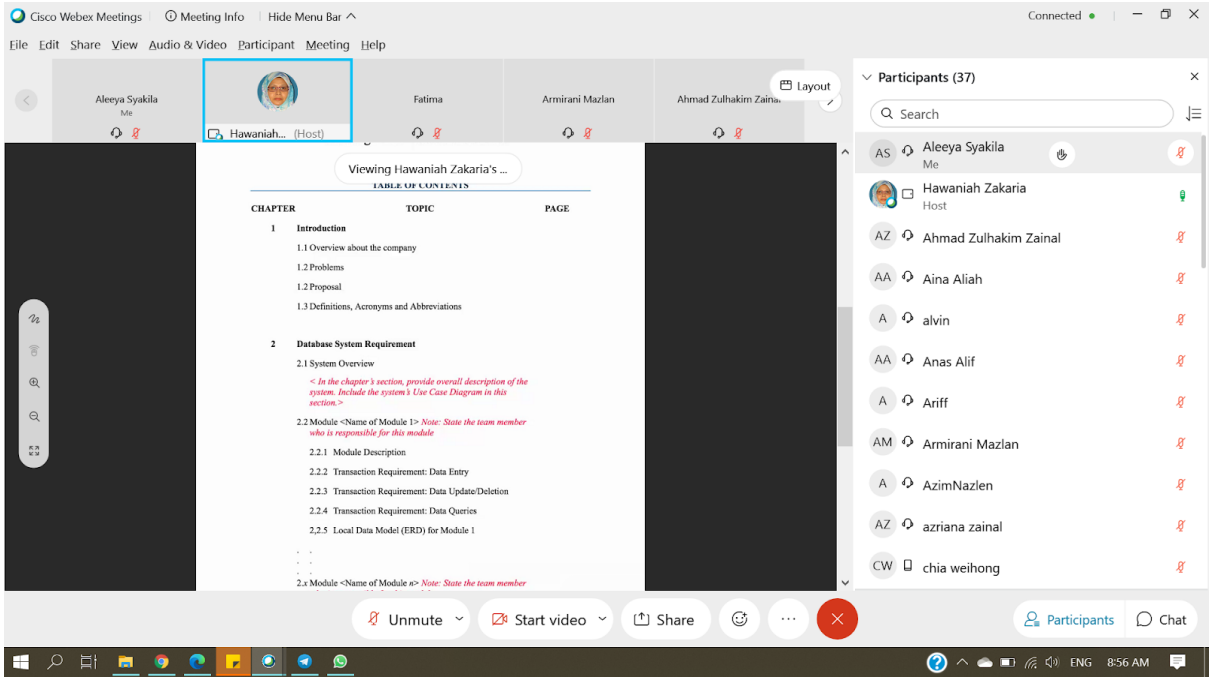
4.2.6 Manage complaint

Use Case Name	**Login**
Use Case Description	User manage complaints
Actors	Admin,Lab PIC ,Technician Assistant, Engineer Assistant
Pre-Condition	Only **Admin** can perform all steps **PIC** can only perform CRUD step **Assistant Technician and Engineer** can only perform select assets and update status steps.
Post-Condition	Complaint list updated

Main Scenarios	**Serial No**	**Steps**
Actors/User	1	CRUD complaint
	2	Select assets
	3	Update complaint status
Extension	1a	Complaint form is incomplete System shows an error message
	3b	Status cannot be click

4.3 Meeting Log

On **23 December 2020** at 8am until 10 am, we are having a briefing session with Dr Hawaniah about phase 2 .



On **27 December 2020** at 2.30 pm until 11.59pm, we discussed all requirements for this report. We used discord as our medium to discuss our discussion. We gathered all the information and together we completed the report on the same day.