

UML DIAGRAMS

FOR LIBRARY MANAGEMENT SYSTEM

PROJECT NAME

SOFTWARE REQUIREMENT SPECIFICATIONS

PROJECT BY

GROUP 7

-CHUYE LESSLY

-EBOGO MBA SYNDY CLARA

-NDJEUMI FRESNEL

INSTITUTION

IUEs/INSAM

HND LEVEL 1

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2. UML DIAGRAMS

Unified Modeling Language (UML) is a standard way to visualize, design and document software systems.

Its purpose is to help understand, communicate, and manage complex system structures and behaviours.

There are two main categories of UML diagrams;

2.1 Structural diagrams

Structural diagrams describes the static parts of a system

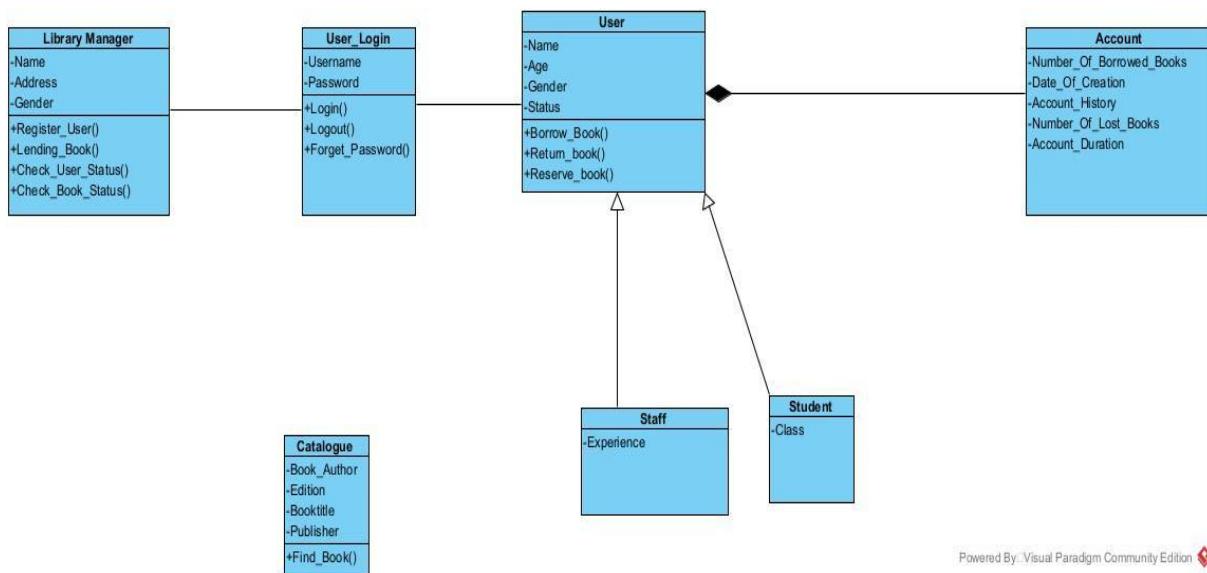
- How it is built
- What components it includes and,
- How they relate to each other.

It is made up of;

- Class diagram
- Object diagram

2.1.1 Class diagram

Class diagram represents classes, their attributes, methods and relationships. It shows the static structure of the system.



Advantages of class diagram

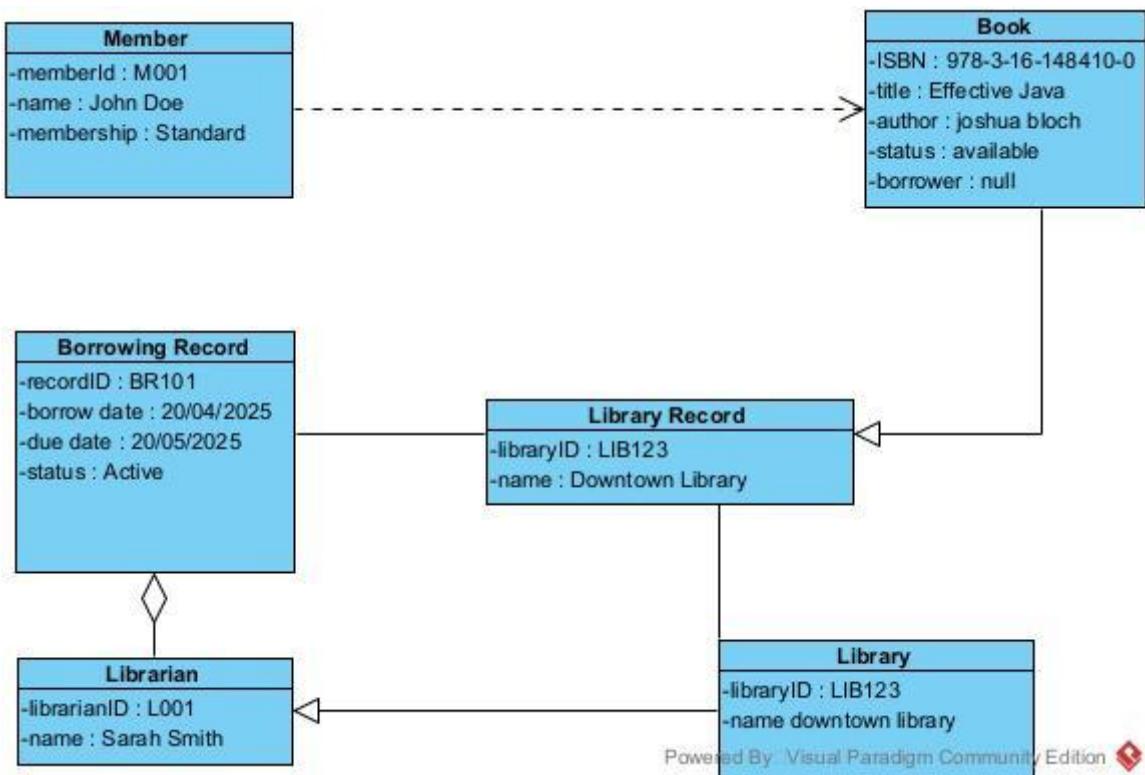
- Clearly shows classes, attributes, methods, and relationships.
- Useful for team collaboration especially with designers, developers, and stakeholders.
- Breaks down large systems into manageable parts.

Disadvantages of class diagram

- For large systems the diagram may become too detailed and hard to read.
- Requires careful planning and updates.
- For very simple systems it may be unnecessary overhead.

2.1.2 Object diagram

Object diagram shows a snapshot of objects and their relationships at a specific point in time.



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Advantages of Object diagram

- Makes object connections and associations more concrete.
- Show the system's state during runtime helpful for spotting issues.
- Often easier to understand for non-technical users.

Disadvantages of Object diagram

- Does not show how objects interact over time.
- Only represents snapshots not the full system behavior or flow.
- Not commonly used in projects so sometimes skipped.

2.3 Behavioral diagrams

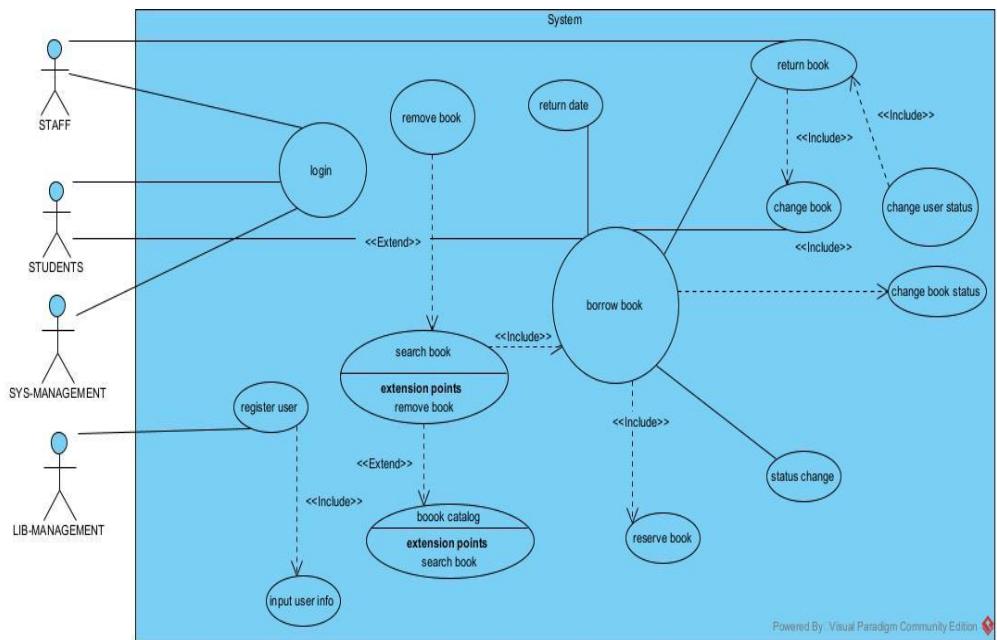
Behavioral diagrams shows how a system behaves overtime and how objects interact, responds to events and workflows progress.

It is made up of;

- Use case diagram
- Sequence diagram
- Activity diagram

2.2.1 Use Case diagram

A Use Case diagram visually represents the interactions between users (actors) and a system focusing on what the system should do not how it does it.



Advantages of Use Case diagram

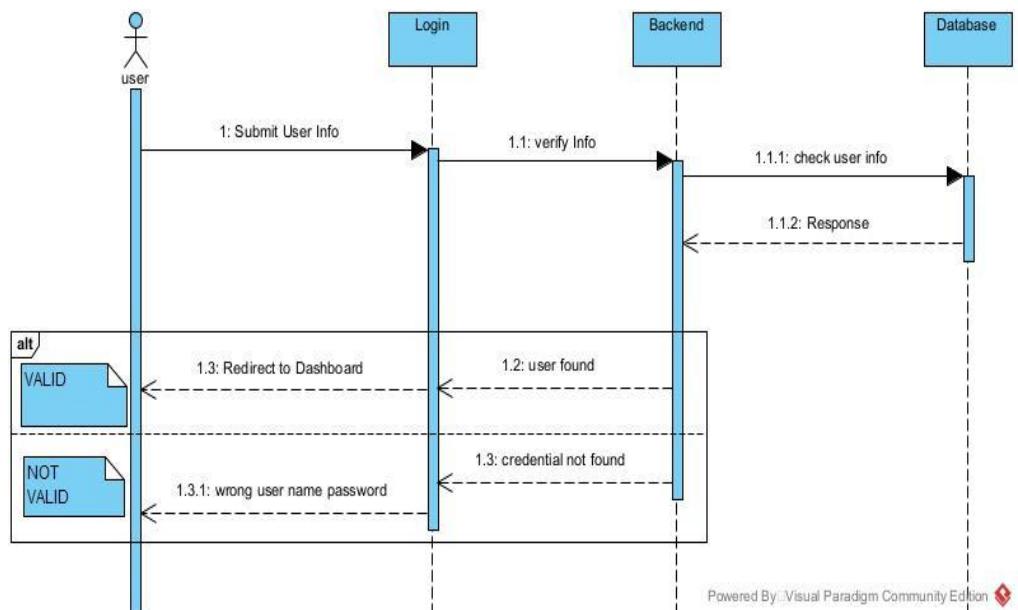
- Uses everyday language and visuals (actors + use cases).
- Great for both technical and non-technical users.
- Acts as a bridge between clients, developers, and testers.

Disadvantages of Use Case diagram

- It lacks details it does not show how the system performs actions.
- Does not show what data is used or passed between steps.
- It is not ideal for complex processes.

2.2.2 Sequence diagram

A Sequence diagram that shows how objects interact in a specific sequence overtime.



Advantages of Sequence diagram

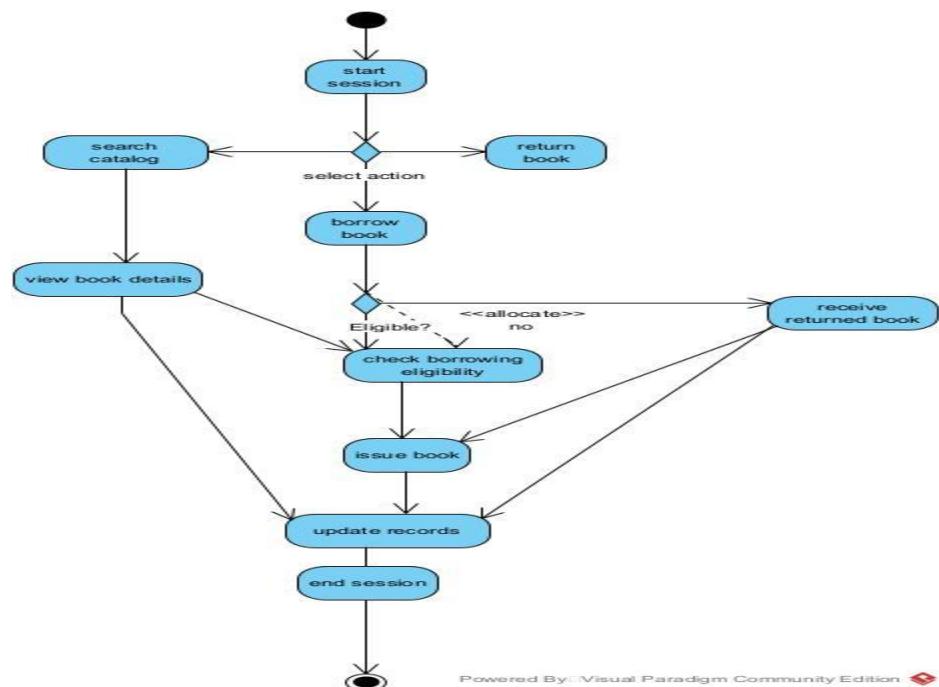
- Shows who communicates with whom and in what order.
- Helps in understanding how a process unfolds step-by-step.
- visualizes the implementation of a use case.

Disadvantages of Sequence diagram

- Can get complex quickly
- Does not show full logic or data structure.
- Not ideal for showing loops, conditions, or parallel actions unless combined with other diagrams.

2.2.3 Activity diagram

Activity diagram represents the flow of activities or actions in a system or process.



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Advantages of Activity diagram

- Easy to understand.
- Makes it easy to spot delays or unnecessary steps in a process.
- Good for showing step-by-step processes conditions.

Disadvantages of Activity diagram

- Can become complicated
- Limited details on object interactions
- Not ideal for Time-based flows.