2023

High Level Design Documentation

of

the project on

Online Book Shop System

Submitted by

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Abstract

Books have long been the best friend of the civilized society. Apart from providing knowledge, it is the propagation of communication that transcends into an intellectual and psychological broadening of the minds of the superior species, the humans. Most printed material have opened new domains of evolution, ideas, research, and a barter of information. The Online book shop carries the tradition of a better improved society that chooses to buy books, trace and track readers as well as buyer-sellers to interact.

The system is primarily an eCommerce application, that is a mega Book mart intended to connect anybody and everybody interested in reading in print. The age-old tendency to widen view with reading is being enhanced by the system.

The system connects people who are book collectors and often feel the necessity to lend their books in exchange of money to people who might carry on their legacy. In a scenario of recent trends to read pdf's and rely on online materials, the system demands commendable respect as it tends to connect readers across the globe, online.

1 Introduction

1.1 Need of a High-Level Design Document:

The high-level Design Document marks out the software requirements of the application to be developed. High level designing contains the overview of the architecture to be developed. The HLD performs the requirements analysis and presents the Software Requirements Specifications. High level designing aims at marking the Hardware and software interfaces to be used in ther project. It consists of the algorithm and details about classes/ methods to achieve the required functionality in terms of business requirements. The Low Levell design aims to achieve the functional and non-functional requirements by giving a technical roadmap for it. The document divided into various sections to make the code reusable and scalable.

The main objective of the project is to make a connection between the people who have a demand for books and those who need the books.

This project shall be delivered in a manner that suggestive changes may be easily implemented without disturbing the already existing data..

1.2. Definitions

- **SRS-Software Requirements Specification**

- **Firewall –Functionality that can allow or block certain ports and addresses.**
- **IPTables – A firewall built into the Linux kernel.**
  - **IPForwarding / IPMasquerading – The ability to forward traffic.**
  - **JDBC – A possible Java-based interface between IPTables and the Database.**
  - **JSP – The language that will be used for displaying user history and administrative functionality.**
  - **Tomcat – a free, open-source implementation of Java Servlet and JavaServer Pages technologies developed under the Jakarta project at the Apache Software Foundation.**

- **Apache - An open source Web server**

- **ER – Entity Relation Diagram**
- **CBQ –Class-Based Queuing. Limits bandwidth at the IP/port level.**
  - **Kernel – Core of an operating system, a kernel manages the machine's hardware resources (including the processor and the memory), and provides and controls the way any other software component can access these resources**
- **DHCP – (Dynamic Host Configuration Protocol) – This is a protocol that lets network administrators centrally manage and automate the assignment of IP Addresses on the corporate network.**
  - **DFD - Data Flow Diagram**
- **Gateway –Bridges the gap between the internet and a local network.**

Overview

- The HLD will:
  - present all of the design aspects and define them in detail
  - describe the user interface being implemented
  - describe the hardware and software interfaces
  - describe the performance requirements
  - include design features and the architecture of the project
  - list and describe the non-functional attributes like:

- security
- reliability
- maintainability
- portability
- reusability
- application compatibility
- resource utilization
- serviceability

1.3. Project Objectives

1.2.1. Admin Objectives

This software system will be a Web application This system will be designed to locate all interested readers to find their books easily as well as those who have hold on to resources, to share it.

In the application, registered users will be given a chance to get hold of books of their interest in various formats and from most of the domains.

Books may be bought and sold likewise. Books may be acquired in physical form in hardcover or as online pdf versions. Other formats of acquirement of physical copies with a compromise on the covering and printing formats may be available for books.

Old book acquirement is a special feature of the system. Donors may directly send their books to the onsite address of the shop or may make available .pdf, .png of their acquired resources online. They would also be given a chance to sell the physical copies at their onsite address, if deemed fit by the owners of the system.

The overall effort of the system is to enhance the habit of self-study and an appreciation to the effort the human race has made to preserve its evolution in languages and its preservation in the form of printed books.

2. HARDWARE AND SOFTWARE REQUIREMENTS

2.1. Hardware Requirements

- Processor: Intel Pentium microprocessor with RYZEN
- Main memory: 512 MB
- Hard disk : 256 MB required
- Keyboard: Standard
- Monitor: 600x800 Resolution or above
- Mouse: Scroll
- Secondary storage: 32GB

2.2. Software Requirements

2.2.1. Tools and platforms used

- Operating System: Windows11
- Front End: HTML, CSS, JAVA, JSP, JS
- Back End: MySQL[WorkBench] 8.0 CE
- Platform: ECLIPSE IDE[2022-09]
- Language: JAVA, JS, JSP

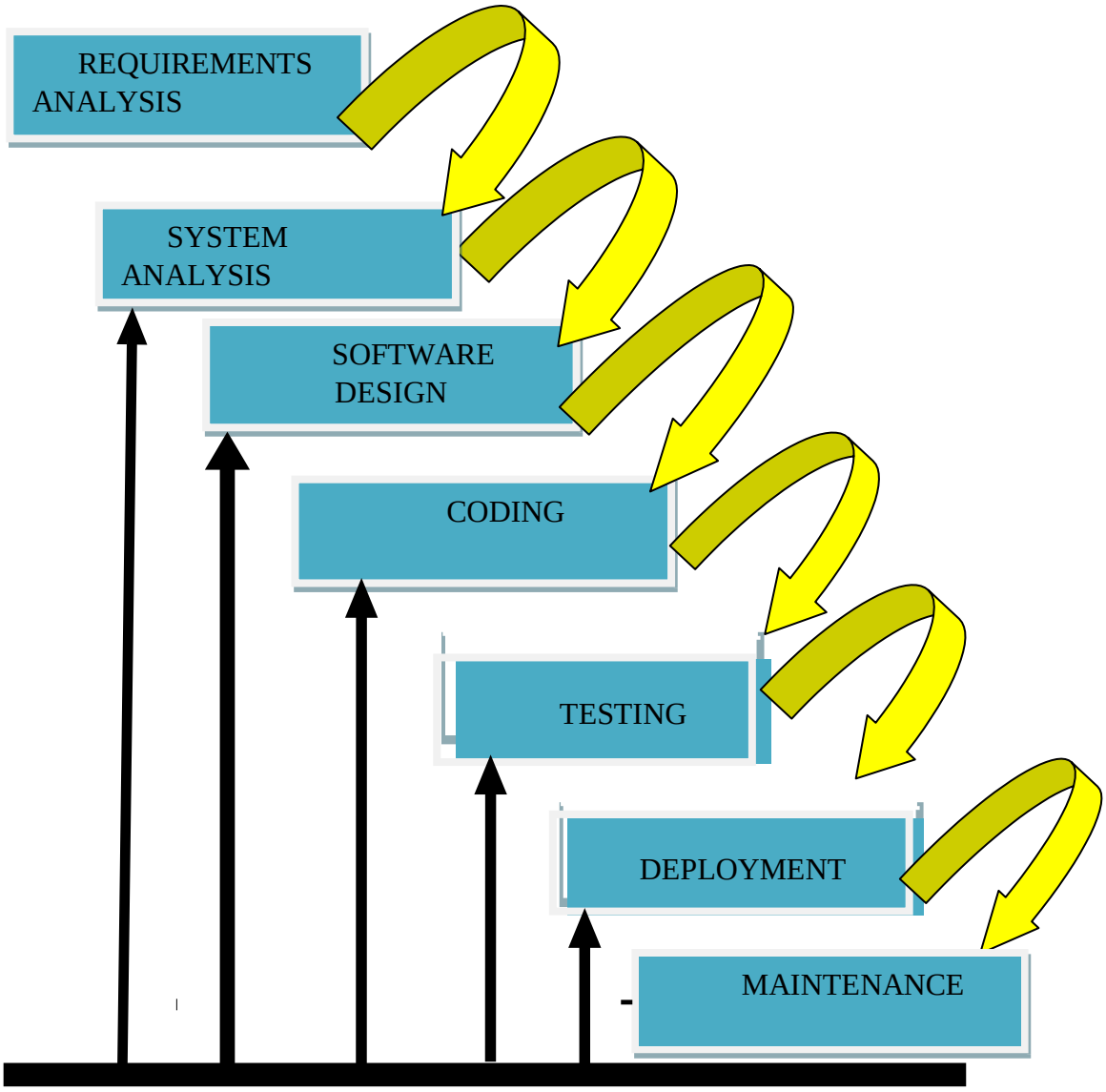
2.2.2. Software interfaces

- Application: Eclipse IDE[2022-09] for javaEE]
- Server: Tomcat 9.0
- Database: MySQl
- Browser : FIREFOX
- Additional API : MS OFFICE

3. . SOFTWARE DEVELOPMENT METHODOLOGY

3.1. SOFTWARE LIFECYCLE MODEL

The software to be developed depends on the series of identifiable stages that would eventually lead to the product. The diagrammatic representation would follow in building the logical framework. It would be based on the requirements analysis and the design phase. The proposed software is planned after the requirements analysis and therefore may be developed by means of the iterative waterfall model. In order to give it a stage to analyse the effects of theprior stage, the iterative approach has been followed.



4. REQUIREMENTS ANALYSIS

4.1. PROBLEM SPECIFICATION

The system to be developed is based on online application development of a book shop. The catalogue of books is made available to prospective clients.

- Clients need to register on the platform to view the different available catalogues.
- After a successful login clients are required to choose domains and subjects of their choice.
- This leads to the choice of old vs new books.
- New Books are available in printed and different formats.
- Physical copies as well as online pdf fomats are available. Some material is available in .png formats.
- Old Books may be ordered according to the residence of the clients and the prospective seller, if the physical copy of the book is not available to the system admin.
- All Readers can be a prospective seller as well.
- They are directed according to their personal choices to access the payment portal and webpages meant for the same.
- All users of the system are requested to follow guidelines and updated information on the applications social media pages

4.2. FEASIBILITY STUDY:

The development of any Software depends on the fact that whether it is feasible for development or not. This study is done for the various factors which might affect the software development, deployment and maintenance. It is also targeted for Customer Relationship Management in future.

4.2.1. TECHNICAL FEASIBILITY:

It includes the hardware software and other technical requirements of the system. It would require at least 256MB of RAM for its smooth functioning. The System requirements are to be fulfilled by the PC on which the system is to be primarilydeveloped. The Software is to be developed in eclipse IDE as a Dynamic Web based Java2EE project. Java, JSP, and Java Script are to be used in Front End. Backend Database is managed in Container Database mysql using the MySQL Workbench. The Intel microprocessor with Ryzen is used in the PC.

The Software is to be managed and maintained after deployment

on an iterative basis,

i.e. updating requirements according to changing needs. As maintainability is easy and development is based on technical updations of academics and availability, the Software is technically feasible. The Software is least prone to attacks as the data involves each individual personally. Less threat for virus and worms are expected as customized data is only to be accessed by registered and authenticated individuals.

4.2.2. SOCIAL FEASIBILITY: This software is expected to have deep social implications. Society and its improvement is dependent on the academic achievements in recent times. If individuals can have easy and better access to different printed formats of knowledge share, they might utilize their time better. Students can contribute better if they can refer up subjects according to their choices. The habit of reading and brain development has long contributed in distinguishing the human kind as superior life forms.

4.2.3. ECONOMIC FEASIBILITY: The users are provided with a free preview to all books once they successfully register in the system. The payment is only to be made once they decide on procuring books in the system. This has been made keeping in view the huge number of users who use a website at the first instance for something they can acquire for free. However, there may be users with a vivid approach who might be interested in actual physical purchase or sale. abilities for a particular domain. These interested users are provided with paid services for earnings of the websites development as well as connecting inanimate resources with human resource.

4.2.4. LEGAL FEASIBILITY:

The Legal feasibility of the system development is based on whether an individual should use the system with a definite purpose. As the registration of the user is done on his/ her own discretion with an acceptance of an Agreement provided by the website developers, no legal action may be taken against the System. The selling of books on the admin site or uploading requests for procurement is based on user discretion and acceptance of full responsibility, the system stands free of any malpractice conducted on physical acquirement of printed material decisions.

The feasibility study conducted on the system has helped its development and further maintenance.

4.1. SOFTWARE REQUIREMENTS SPECIFICATION

This part of the document provides a comprehensive description of the Software to be developed by the system. The different subsections provide the information of the Software and hardware to be used by the system.

4.1.1. PURPOSE: The SRS aims at the development of the system requirements. The Online Book Shop aims at bringing the Purchasers, Buyers, readers and authors under one organization.

The vision of the system is an unified platform of printed media in storable format. **The mission** is to strive towards the goal carrying All new publications and old books along.

4.1.2. SCOPE: The system may be used by an individual after registration to determine his/ her interest in books.

- The report is generated for the system in the form of a readers interest, orders and reading abilities. The Webpage of Readers profile is maintained for the purpose.
- The Report generated would be a monthly and weekly as well as annual analysis of reading habits. These would be valued by employers or other organisations to form an opinion of a person based on recognized standards.
- The suggestions for individuals would also be based on search or recent trends
- .ABBREVIATIONS:

SRS	Software Requirements Specification
DFD	Data Flow Diagram
ERD	Entity Relationship Diagram
ID	Identification Definition
OBS	Online Book Shop
PP	Payment Portal
IDE	Integrated Development Environment

Table : 5.1.

Specification: IEEE STD 830-1993

4.1.3. FUNCTIONAL REQUIREMENTS:

This gives specific the system is supposed to behave after deployment in the virtual machine. It also gives what inputs are provided to which process and what is the expected output of each. It also denotes how the system might behave and what are the specific data manipulations and calculations.

4.1.3.1. User perspective:

5.4.3.1. 1. User Registration on the system.

Input: Providing user details.

Output: User ID.

5.4.3.1.2. User login to the system.

Input :User ID and password

Output : Forwarding to the Catalogue Overview page.

5.4.3.1.3. User profile set up.

Input: Uploading of Photo and files related to academics, work experience, writing and reading abilities.

.Output: User is given a chance to download profile as a further laurel in jobs, career and other areas of interest.

5.1.3.1.3. Catalogue overview page

Input: Choice of subjects, primary and secondary interests are to filled in popups.
Output: Detailed pages on user Choice opens.

5.4.3.1.4. NewBooksPage

Input: New releases and trending books are shown
Output: Forwarded to the buyBook Page or CheckPreview

5.4.3.1.5. Old Books Page

Input: Old Books are shown according to choice

Output: Reader choice saved

5.4.3.1.6. User Payment Portal page:

Input: User chooses to buy books

Output: Redirection to payment portal.

5.4.3.1.7. User Payment portal.

Input: Payment mode and card details.

Output: Confirmation of payment and redirection to Book Orders screen.

5.4.3.1.8. User Reading Track Page

Input: User email id to check Reading track

Output: Tracks Reading for Weeks, month and Year

5.4.3.1.9. User NewBooks Order page

Input: user ID , email, choice of book, choice of format

Output : BookOrderReceipt

5.4.3.1.10. User Old Books Order Page

Input: user email, choice of old book, format, Acquiring methods

Output: Order Receipt

5.4.3.1.11. User Bppk Selling Page

Input: Book ISBN, subject, Title, description, and Cost
Output: Book to be Sold screen

5.4.3.1.12. User feedback

Input: feekback on thank you page
Output: Greetin

5.4.3.2. Admin Perspective:

5.4.3.2.1. Admin login

Input : admin ID and password.

Output : admin access to system with successful login

5.4.3.2.2. Admin dashboard

Input : addition of new books

Output : updation of new Books page in system.

5.4.3.2.3. Authentication of users

Input : checking user ID and password for authenticationOutput:
Output: Availability of system to authenticated users.

5.4.3.2.4. Generation of Payment receipt

Input: answer choice of users on test screen

Output : Generating score with set rules and marks.

5.4.3.2.5. Generation of order receipt for new books

Input: Book Title, author
Output: Book ISBN, subject, and Cost

5.4.3.2.6. Generation of Order receipt and confirmation for old books order:

Input: Book Title, author
Output: ISBN, subject, Cost

5.4.3.2.7. Generation of Reading Track

Input : Books Read till date by user

Output : Greetings, Gifts and a record of Search Intent

5.4.3.2.8. Book Sell Option

Input : User choice of selling methods, cost guidelines
Output: Book to be sold registered and other users notified

NON-FUNCTIONAL REQUIREMENTS: These are directly related to thefunctioning of the system. The main constraints of the system are

- **Authentication of users :** This feature will provide the login to user profile only when the user inputs registered userID, password and the mobile number registered is validated with a button sent to it for 2 way authentication**.**

- **Presentation of flawless testing screens:** This would depend on the IDE used, wifi Connection and speed. This would also depend on the SceneBuilder which would help build the Graphics used in System.

- **Generation of authentic score :** This would depend on the logic of Calculation and the access of data from Database. The feature of userID would allow the right user to receive the score.

4.1.3.2. Hardware interface:

- Screen Resolution of 600x800.
- Mouse for scroll
- PC or Laptop with WiFi Connection for the Web based project.

4.1.3.3. Software Interfaces:

- MySQL WorkBench 8.0 CE
- Eclipse IDE for developing Code and webapps
- Windows 10 OS

4.1.3.4. Communications Interfaces: None

5.4.4.5. Performance requirements:

Http will be used

4.1.4. Software System attributes:

- Security : Achieved with authentication and the 7-Zip (Encryption tool) downloaded with Softwares, provide security features and do not allow intrution into the System.
- Maintainability: This is achieved by updating the system on the basis of present requirements and implementation of Client demand techniques, as gathered from feedback of users.
- Portability : This feature is achieved by using JAVA as a programming language. The OOPS feature helps the system to have a portable feature. It is therefore made to run on any Operating System on any machine.

5. PROJECT PLANNING AND SCHEDULING

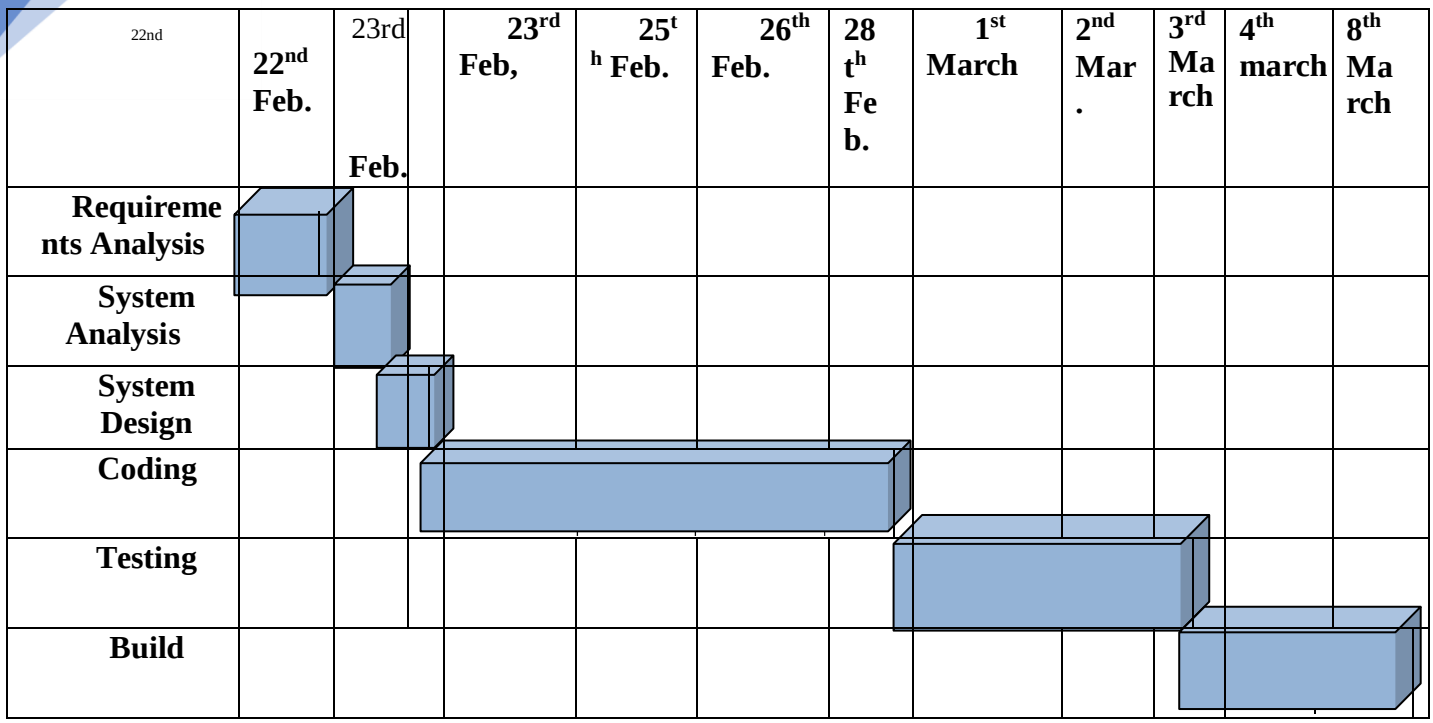
NAME OF PHASES	SUB PHASES OR DESCRIPTION	
Requirements analysis	Problem definition	
	Feasibility study	
	Software requirements analysis	
Milestone : Successful SRS and Feasible System. Proceeding to Designing the System		

System analysis	Project planning and scheduling	
	System DFD	
	System Designing	
	Structure designing	
Milestone :Completion of Design. Proceed to code the System		
Coding	Coding with Comments	
	Code Efficiency	
	Error handling	
	Parameter Passing	
	Validation Checking	
Milestone : Error free Code		
Testing	Integrated Testing	
	System Testing	
	Debugging	
Milestone : Successful Testing		
Implementation and Maintenance	Deployment and improvement	
Milestone : Successful Implementation		

Table:6.1

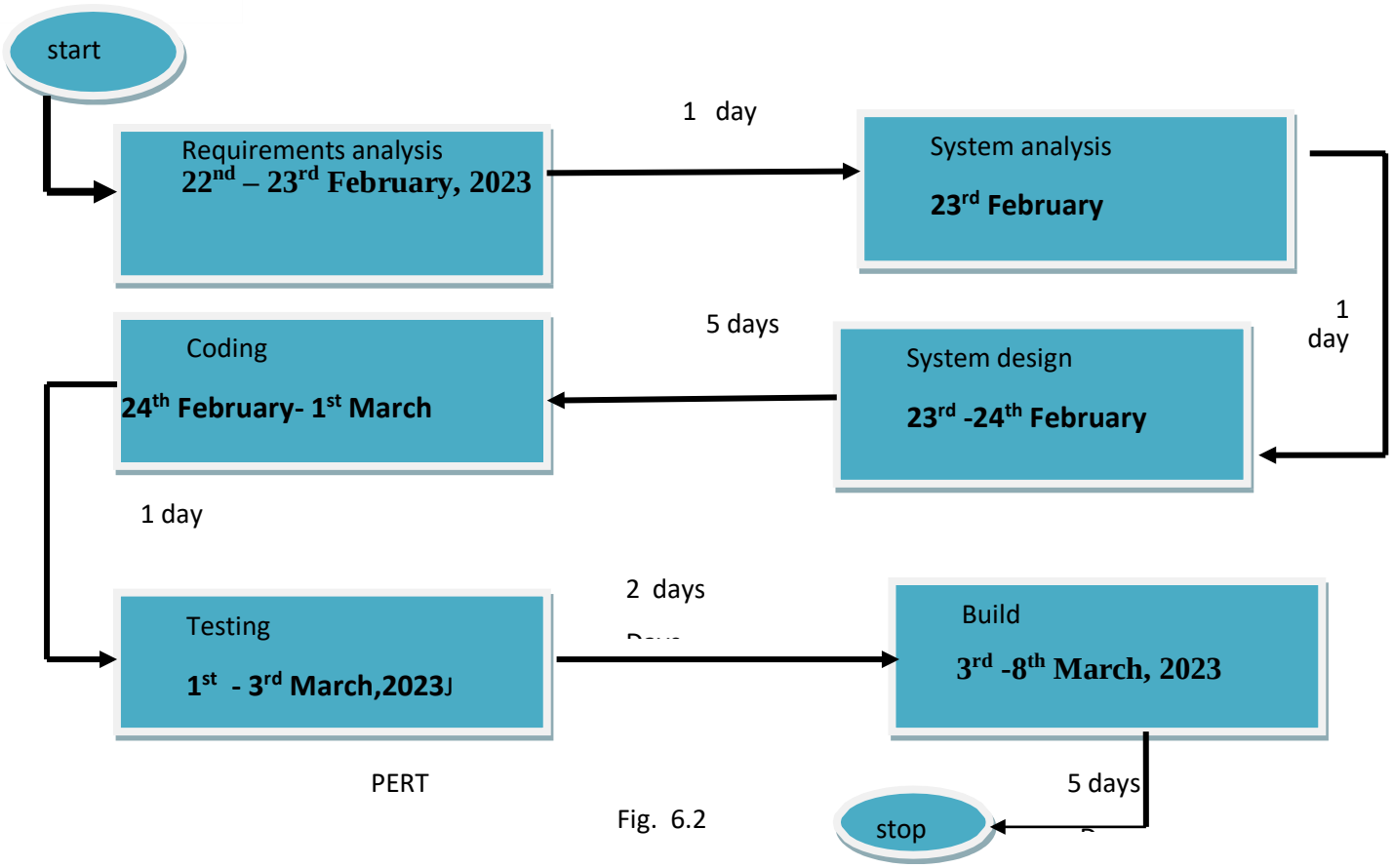
5.1. GANTT CHART: A horizontal bar chart which visually represents a project planover time. The chart shows status of each task in the project.

TASK	START DATE	DAYS TO COMPLETE
Requirements analysis	**22nd – 23rd February, 2023**	**2 days**
System Analysis	**23rd February**	**1 day**
System Design	**23rd -24th February**	**1 day**
Coding	**24th February- 1st March**	**5 days**
Testing	**1st - 3rd March, 2023**	**2 days**
Build	**3rd -8th March, 2023**	**5 days**



Gantt Chart Fig. : 6.1

5.2. Pert Chart: A PERT Chart is a project management tool that provides a graphical representation of a project's timeline. The **Program Evaluation Review Technique** breaks down the individual tasks for project analysis.

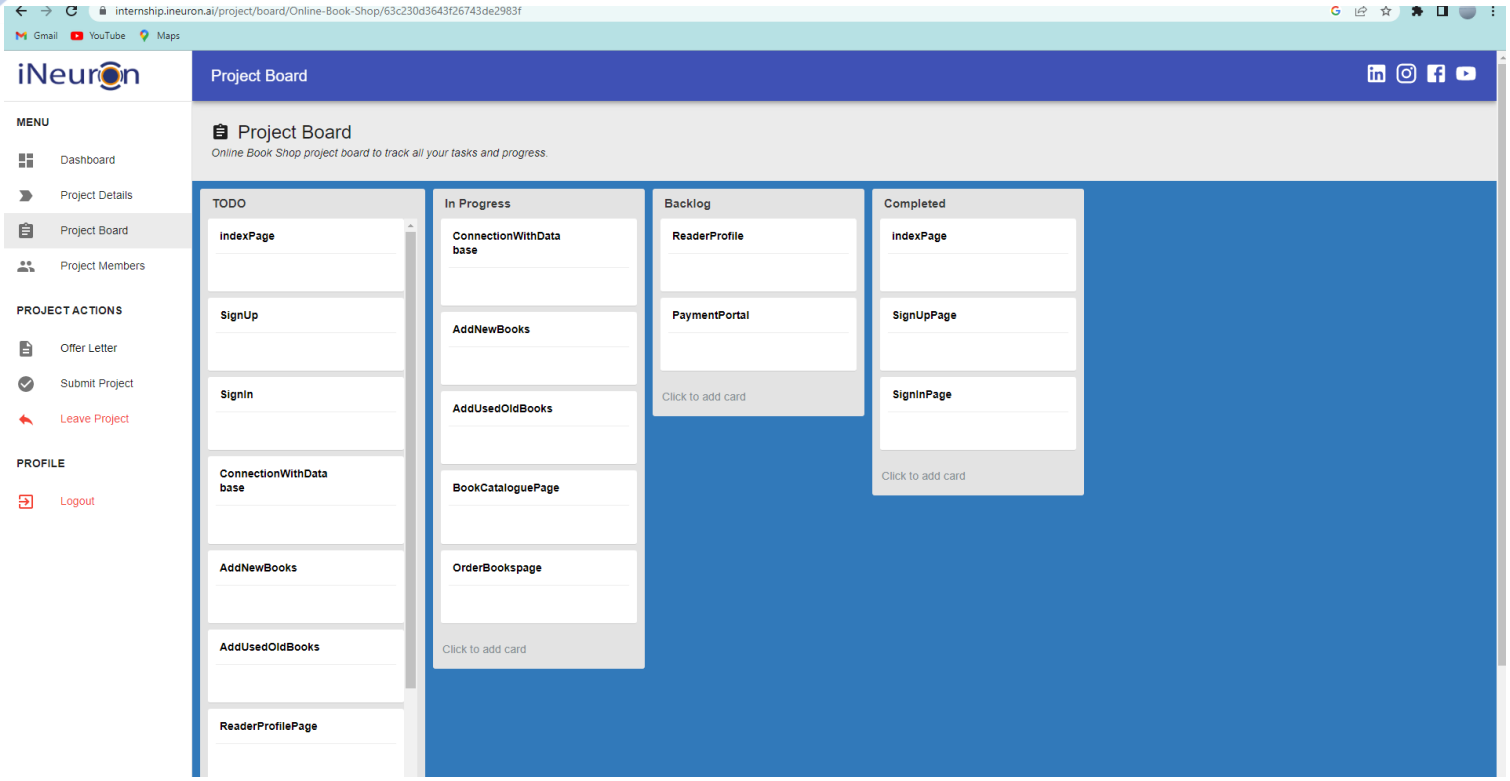


PERT

Fig. 6.2

5.3. Kanban board

According to The ineuron IntershipPortal guidelines a Kanban Board is provided for project scheduling and marking of completion of the project webpages. All Webpages were designed following a schedule. The Kanban Board gives an opportunity to schedule tasks and keep track of backlogs and completed tasks. The board does not allow the user to keep track of every proceeding. The dates are not reflected each time after login. The testing after every phase puts the burden of ultimate testing at the maintenance phase.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Project Board
MENU
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Project Details
Project Board
Project Members
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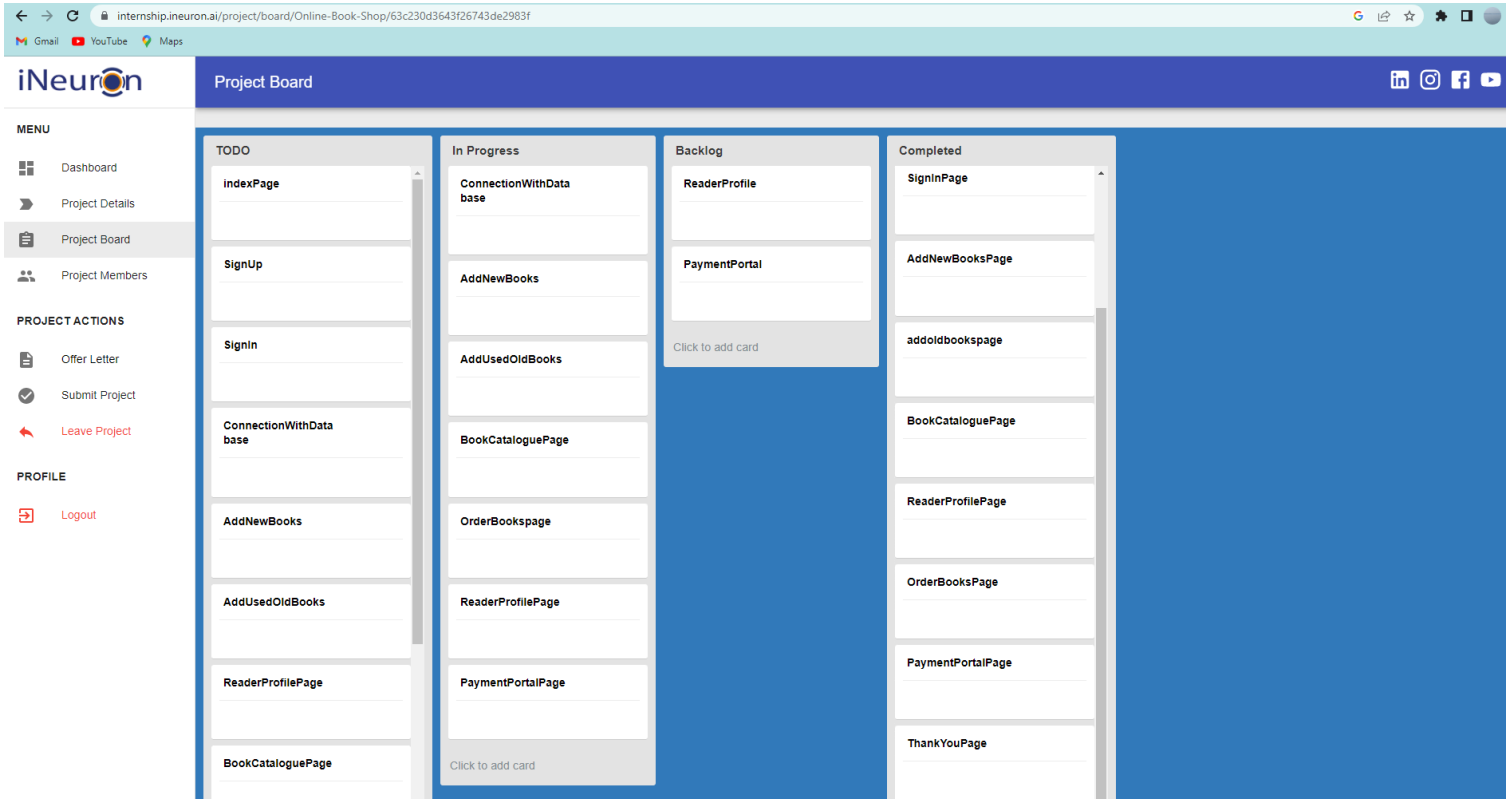
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Project Details
Project Board
Project Members
PROJECT ACTIONS
Offer Letter
Submit Project
Leave Project
PROFILE
Logout
TODO
indexPage
SignUp
SignIn
ConnectionWithData base
AddNewBooks
AddUsedOldBooks
ReaderProfilePage
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In Progress
ConnectionWithData base
AddNewBooks
AddUsedOldBooks
BookCataloguePage
OrderBookspage
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PaymentPortalPage
Click to add card
Backlog
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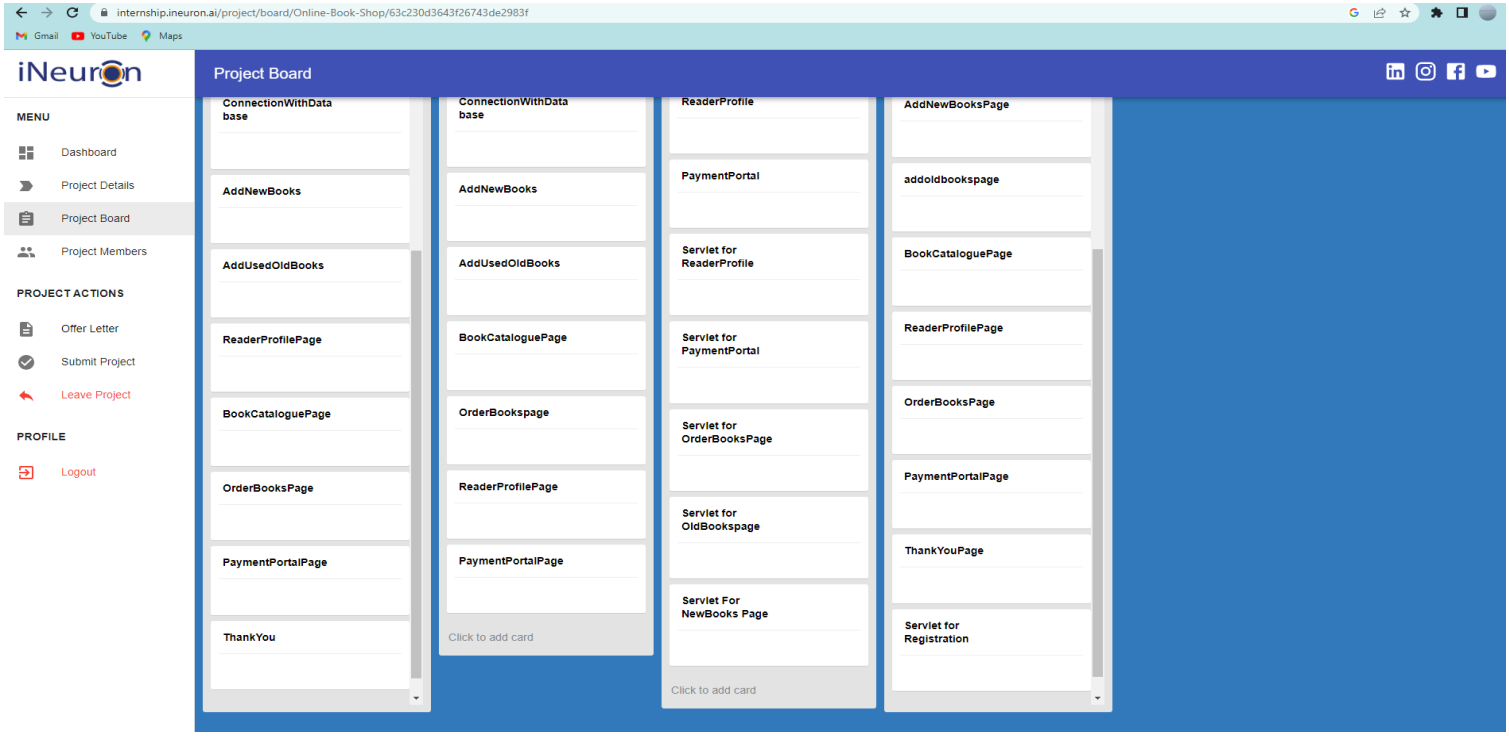
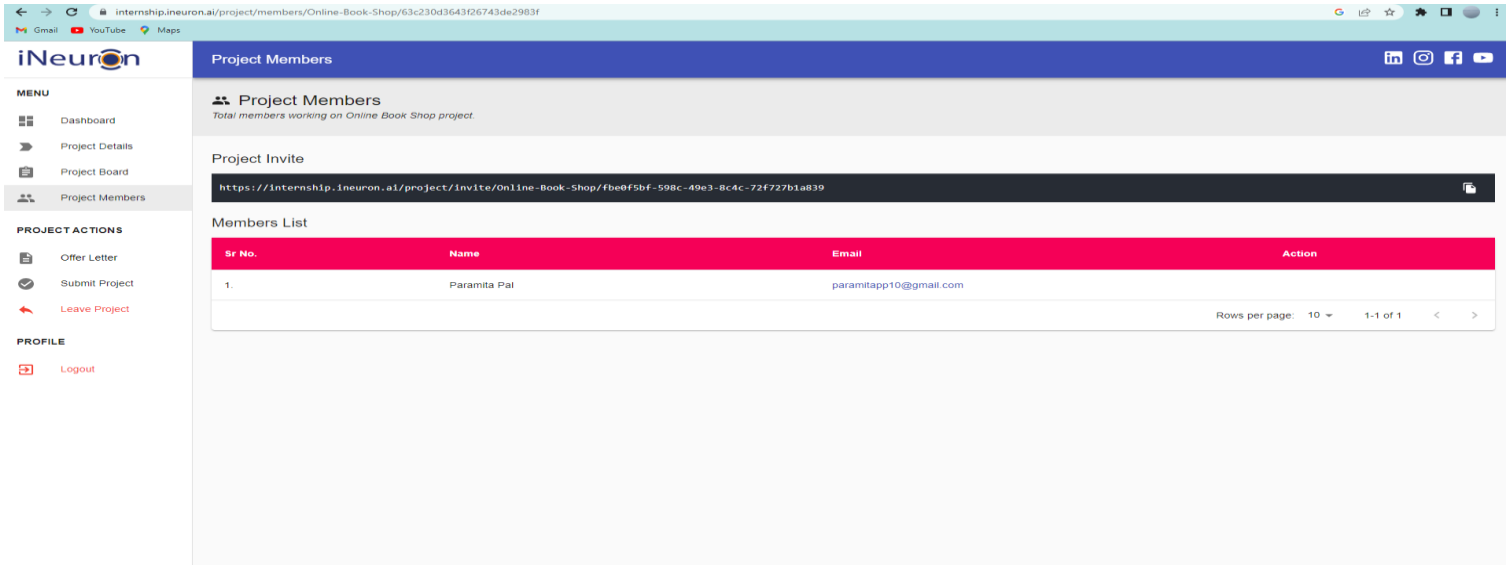


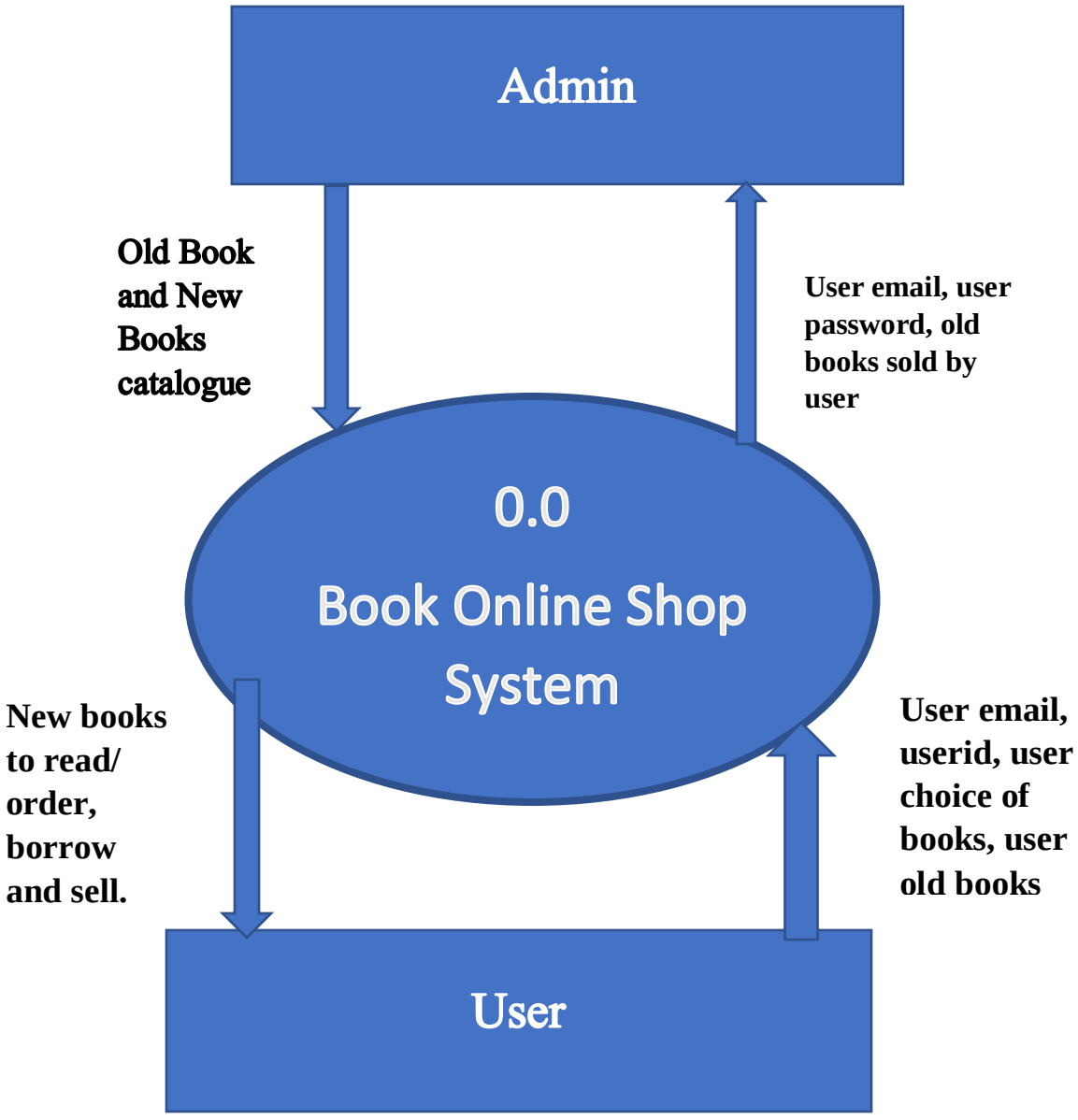
I have enrolled for the project alone without any other members. As a lone member assignee of the project, I have had to pay heed to my :



6. ANALYSIS

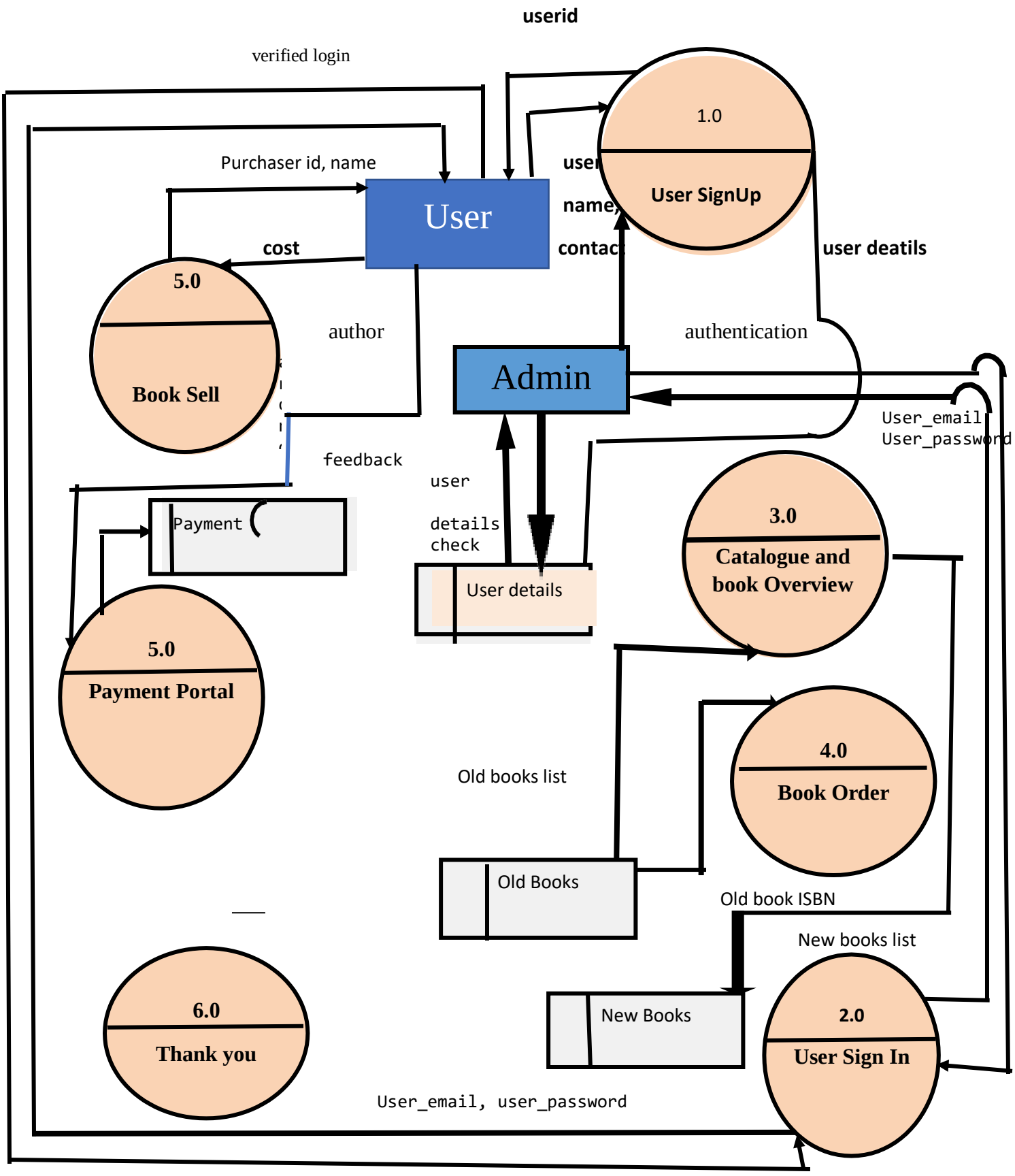
6.1. DATA FLOW DIAGRAMS (DFD): Drawn to show the flow of data between processes and entities of a System. It has no control flow. It is a mapping to demonstrate the flow of input and output from a process or entity.

6.1.1. CONTEXT LEVEL (ZERO LEVEL) DFD OF THE SYSTEM



6.1.2. LEVEL 1 DFD

6.1.2.1. System



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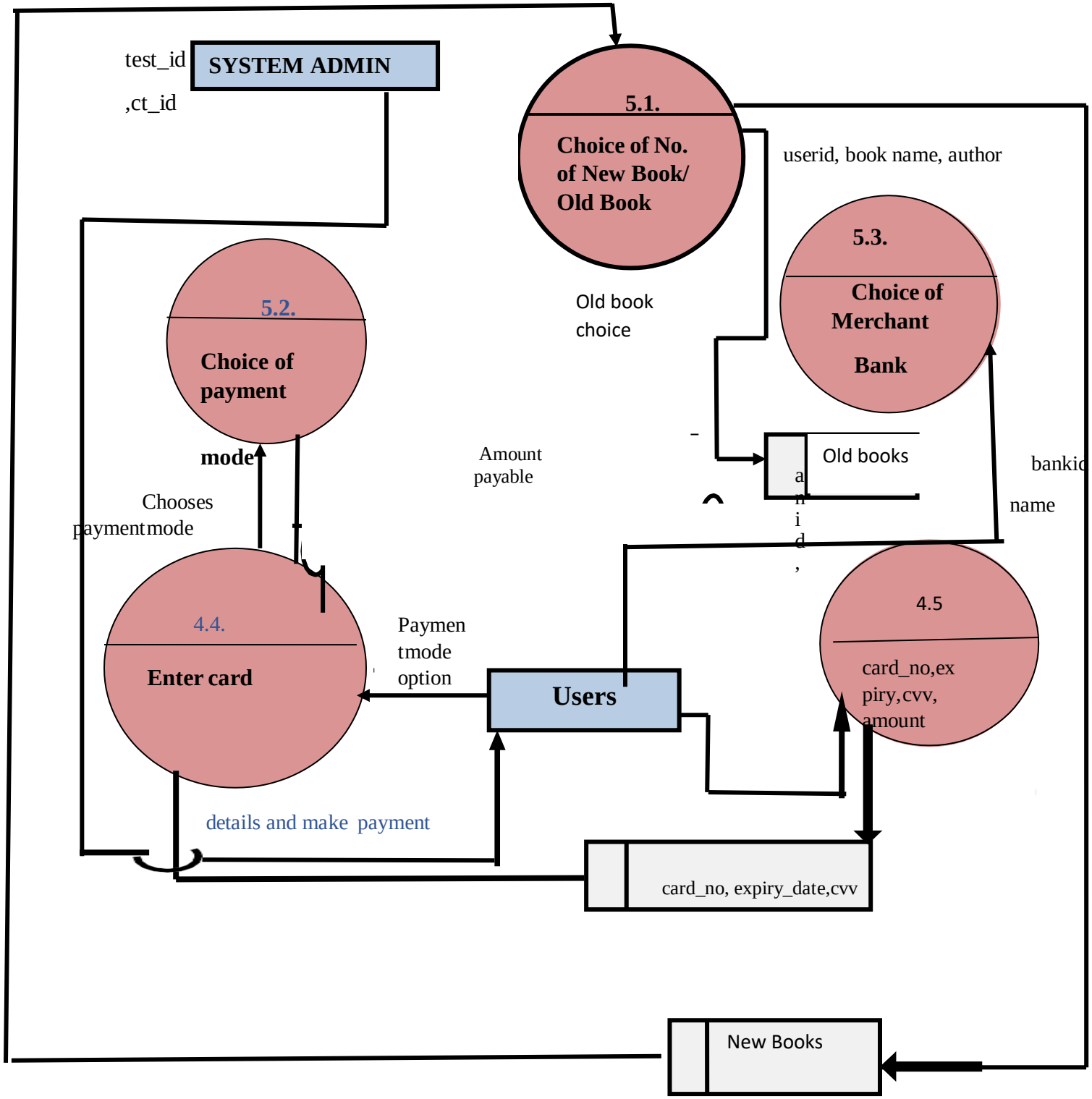
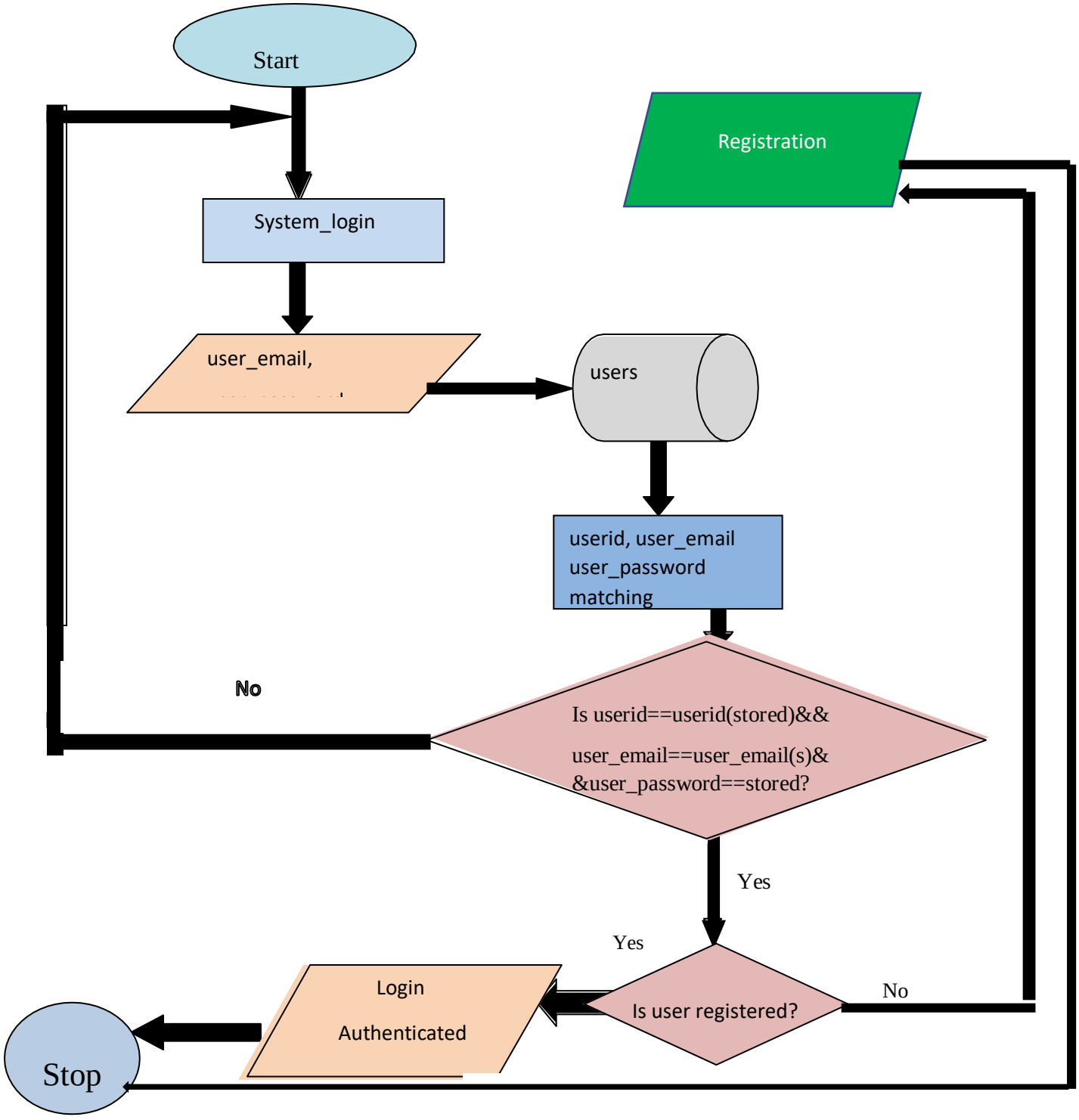
6.1.3.1. PAYMENT PORTAL(LEVEL 2 DFD)



FLOW CHART

7.3.1. Module 1: user_login: This module is activated after user_registration and the user is provided the login button. If the user presses the login button the user is presented with the login module. The user enters the user_email and user_password. The users table in database stores an userid generated from user_email and password. The entered credentials are checked with stored ones. If the match occurs verification is done On successful completion of the processes, the user is verified as authentic and allowed access.



7.3.2. Module 2: BookCatalogue : This module is available to all users who have registered and made a successful login. After login, users are given usual instructions and information about the application and its working procedure. Making a profile on the site is optional. However, users with profiles are kept updated with new updations and available advantages of the BookManagement System

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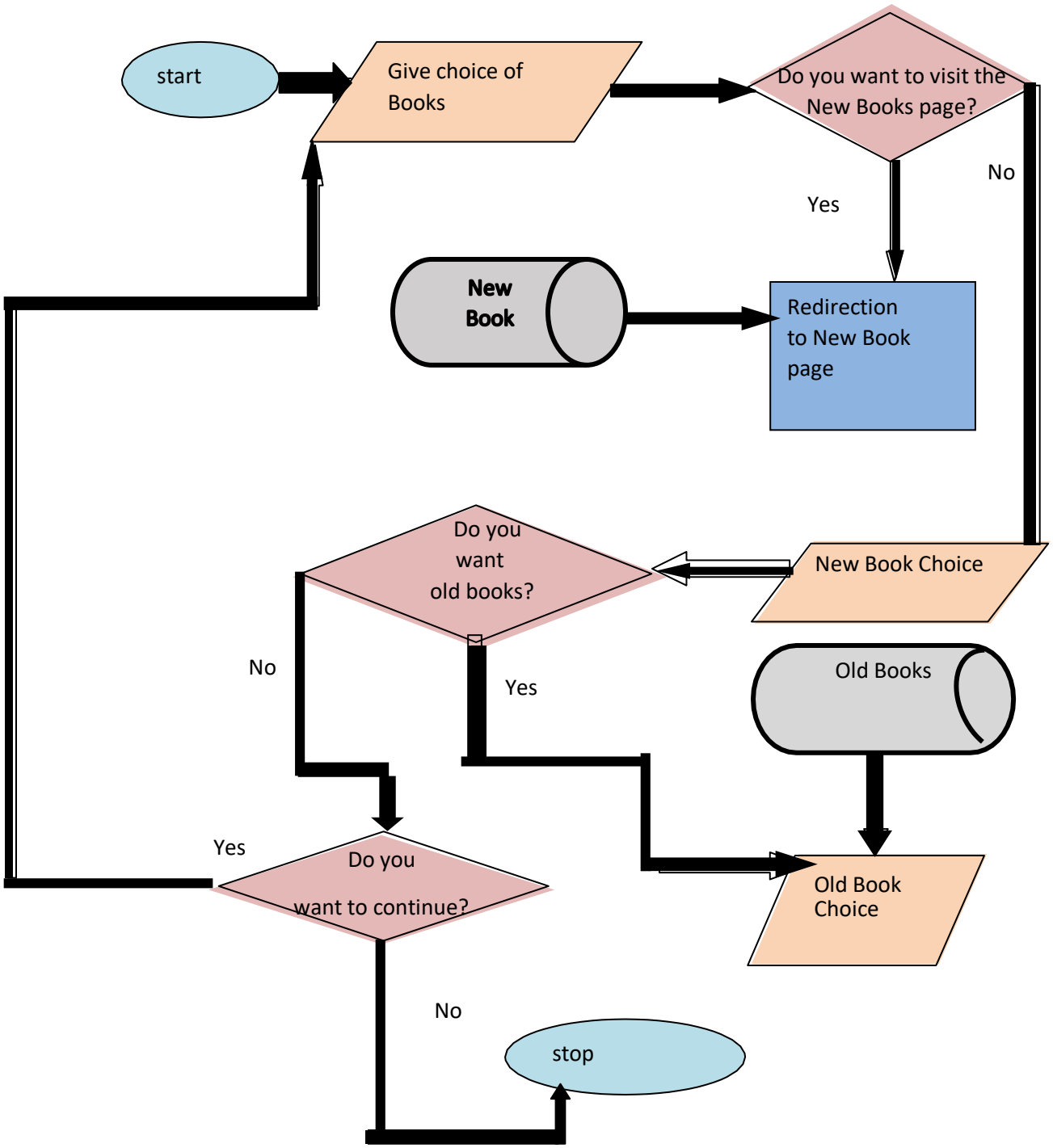
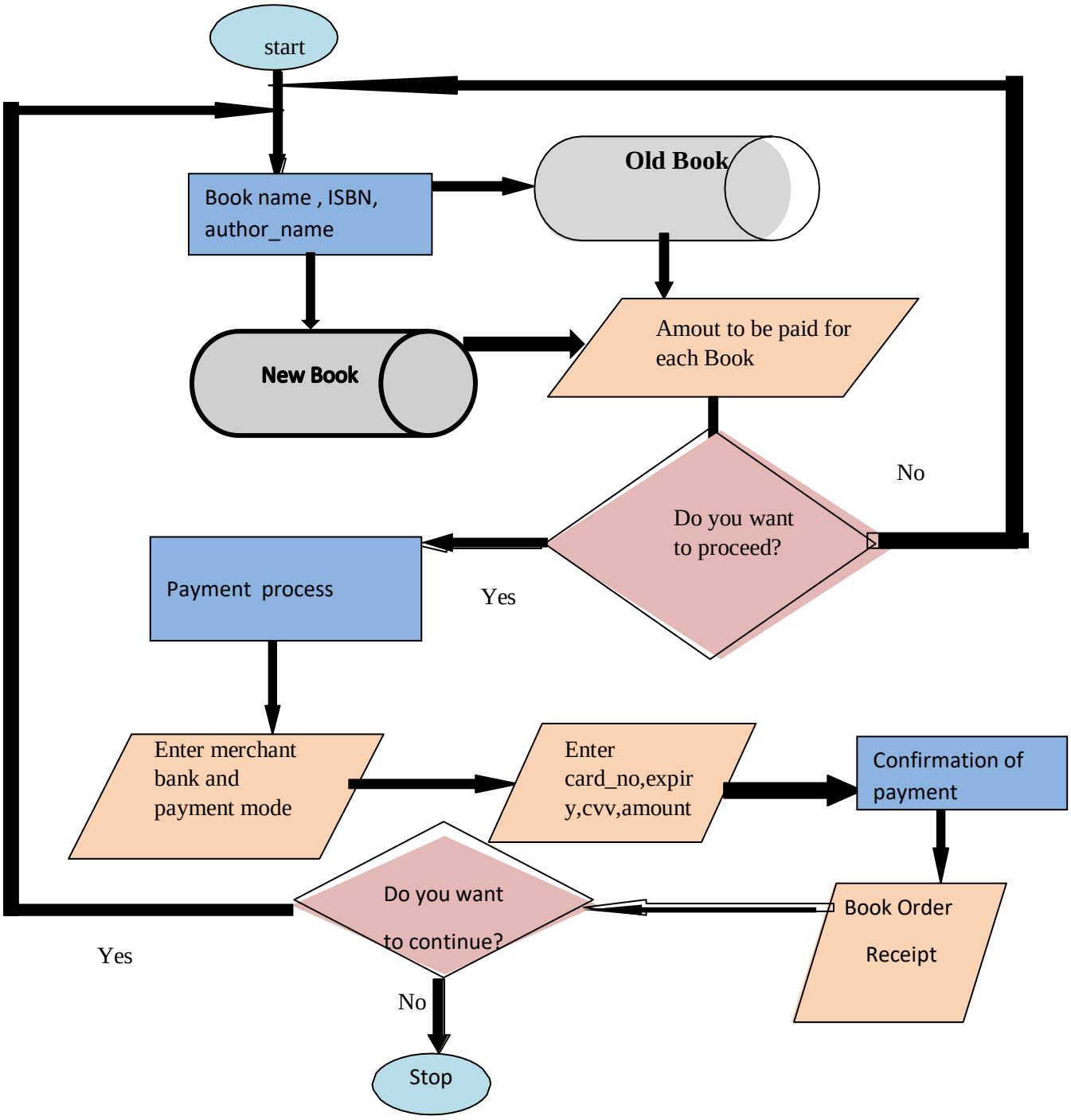
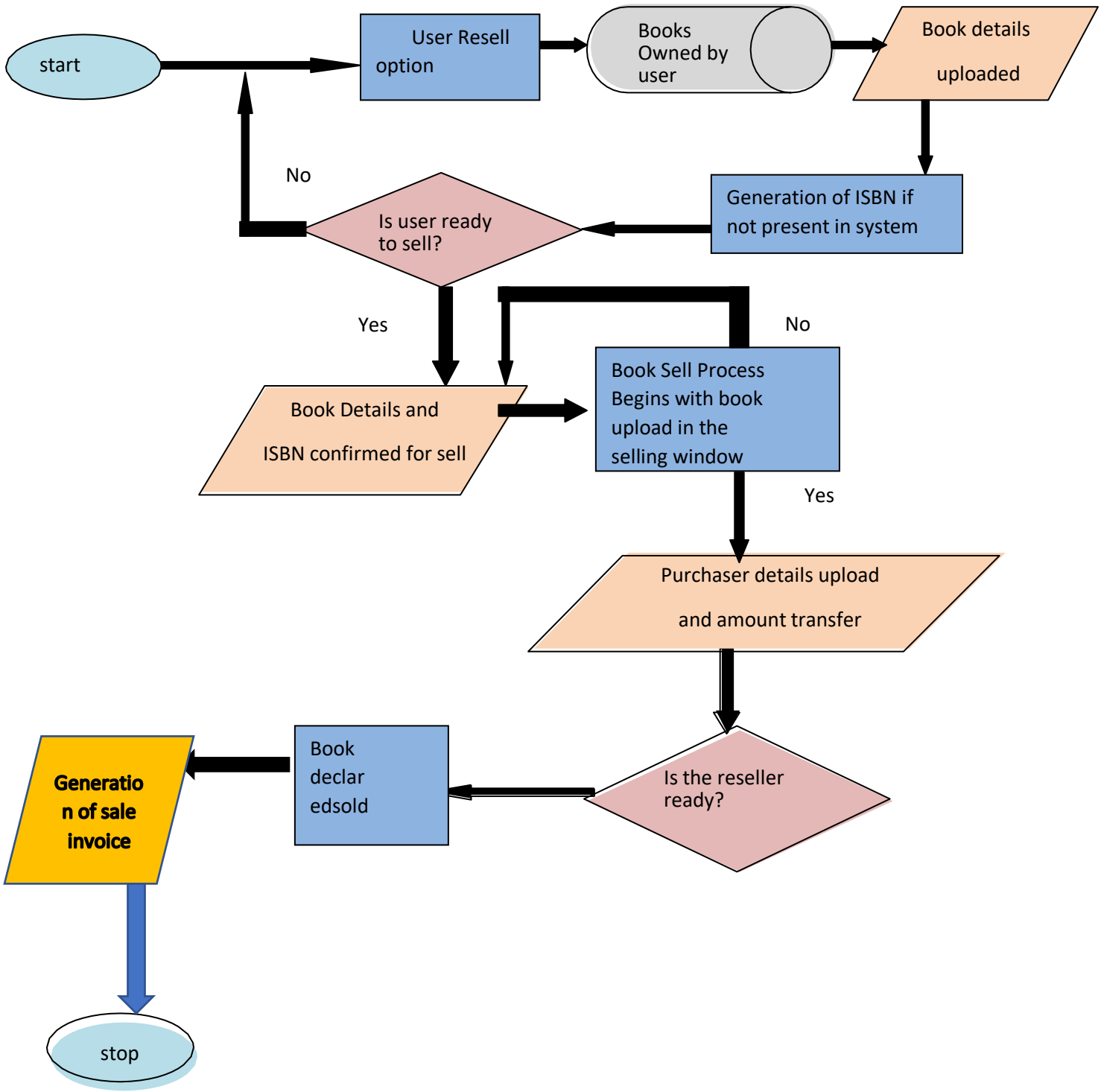


7.3.3.Module 3: payment_portal : The payment portal is to be accessed by the users who wish to buy old or new books. This portal is also used by Book selling enthusiasts. Each mode has its own cost , the user may enquire and access this mode if desired.



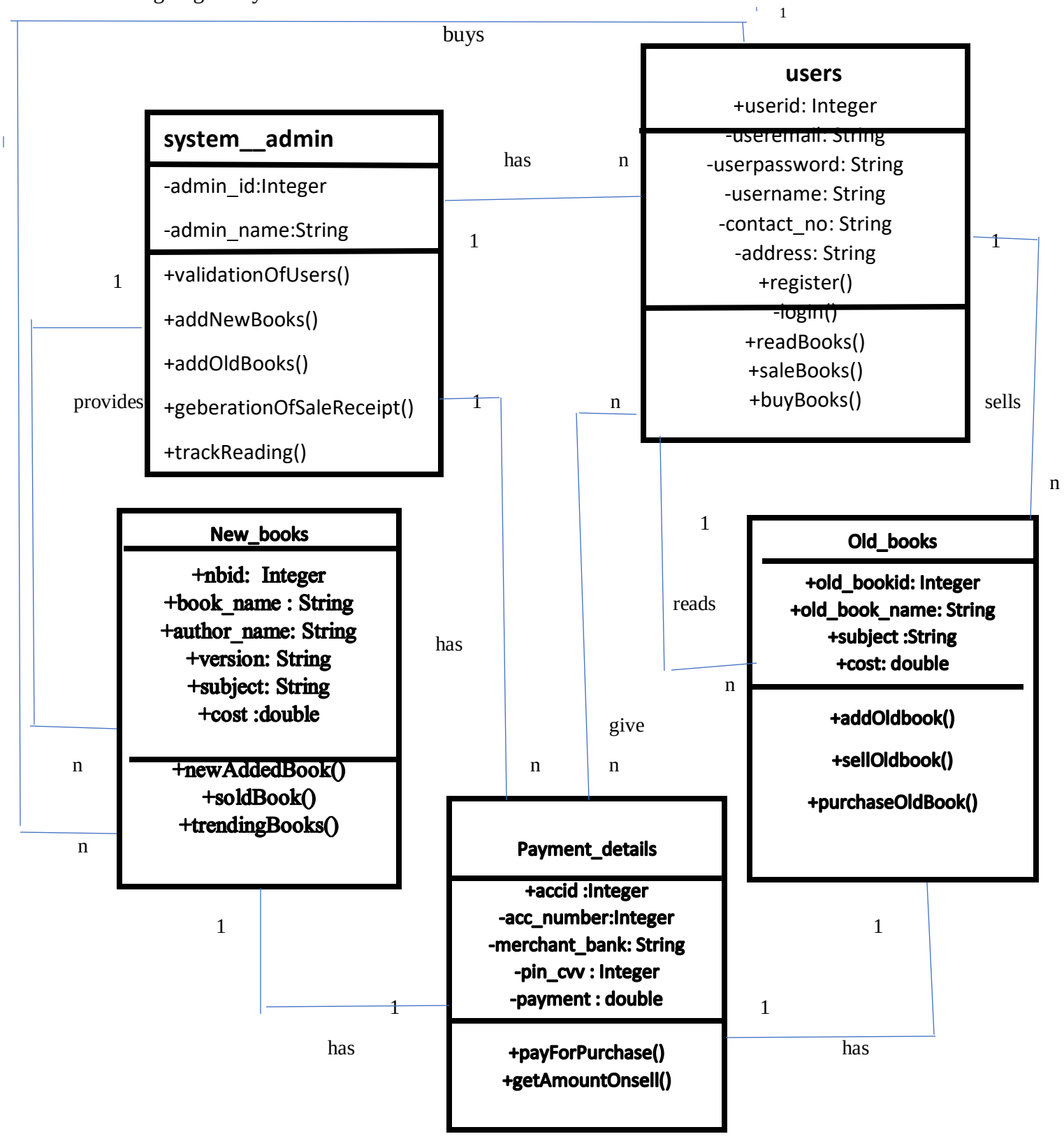
7.3.4. Module 4 : Book Resell: Book Resell process is the unique feature of this system. Book Selling occurs here in2 ways

- New Book Sell
- Old Book Resell



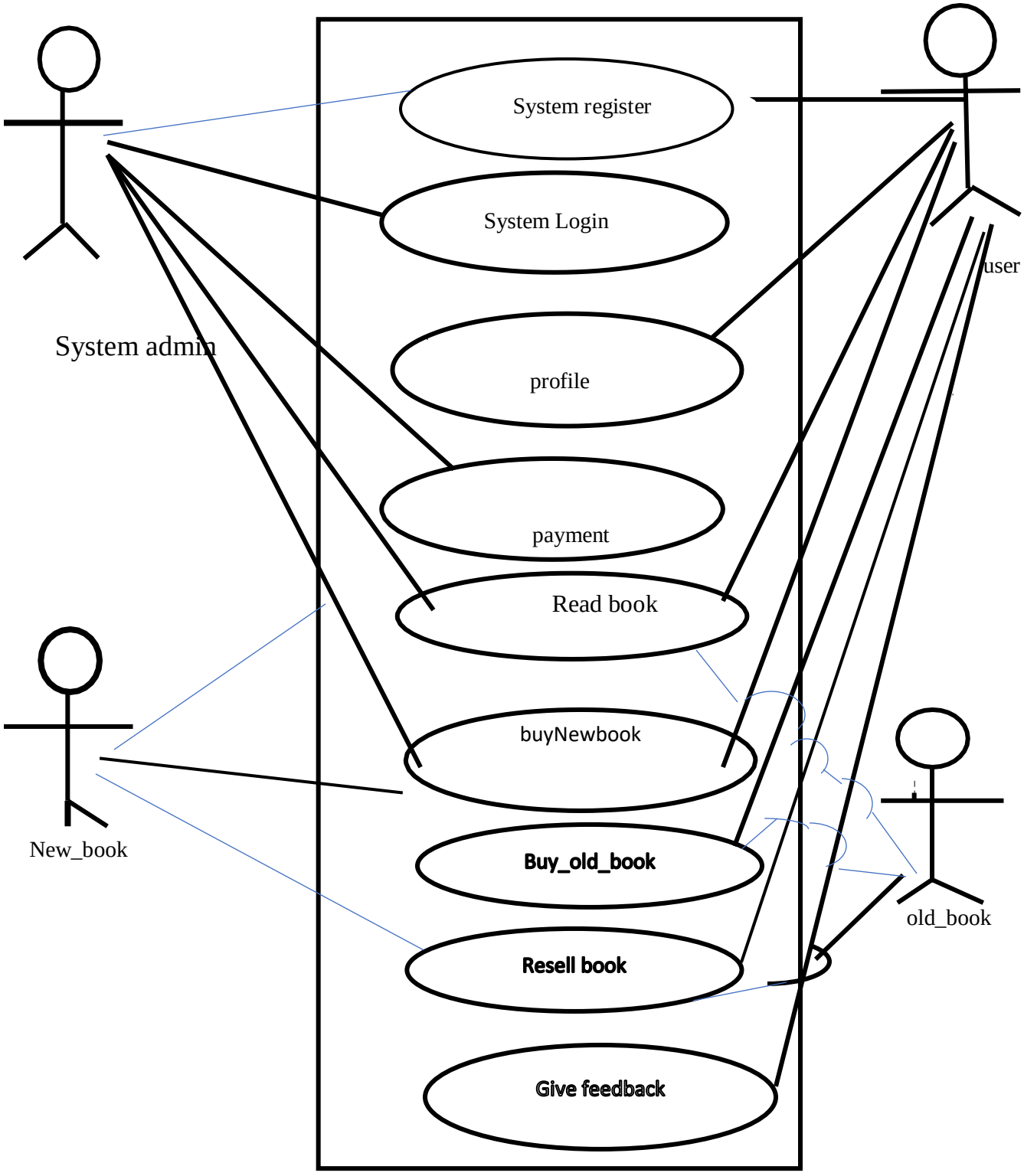
6. SYSTEM DESIGN: The design phase focuses on the detailed implementation of the system recommended in the feasibility study. Emphasis is on translating performance specifications into design specification. The design phase is a transition from a user- oriented document (system proposal) to a document oriented to the programmers or data base personnel.

6.1. CLASS DIAGRAM: It is used as a mapping to design systems in Object Oriented languages. It is a static representation of each class, interface, association and constraint involved in designing the system.

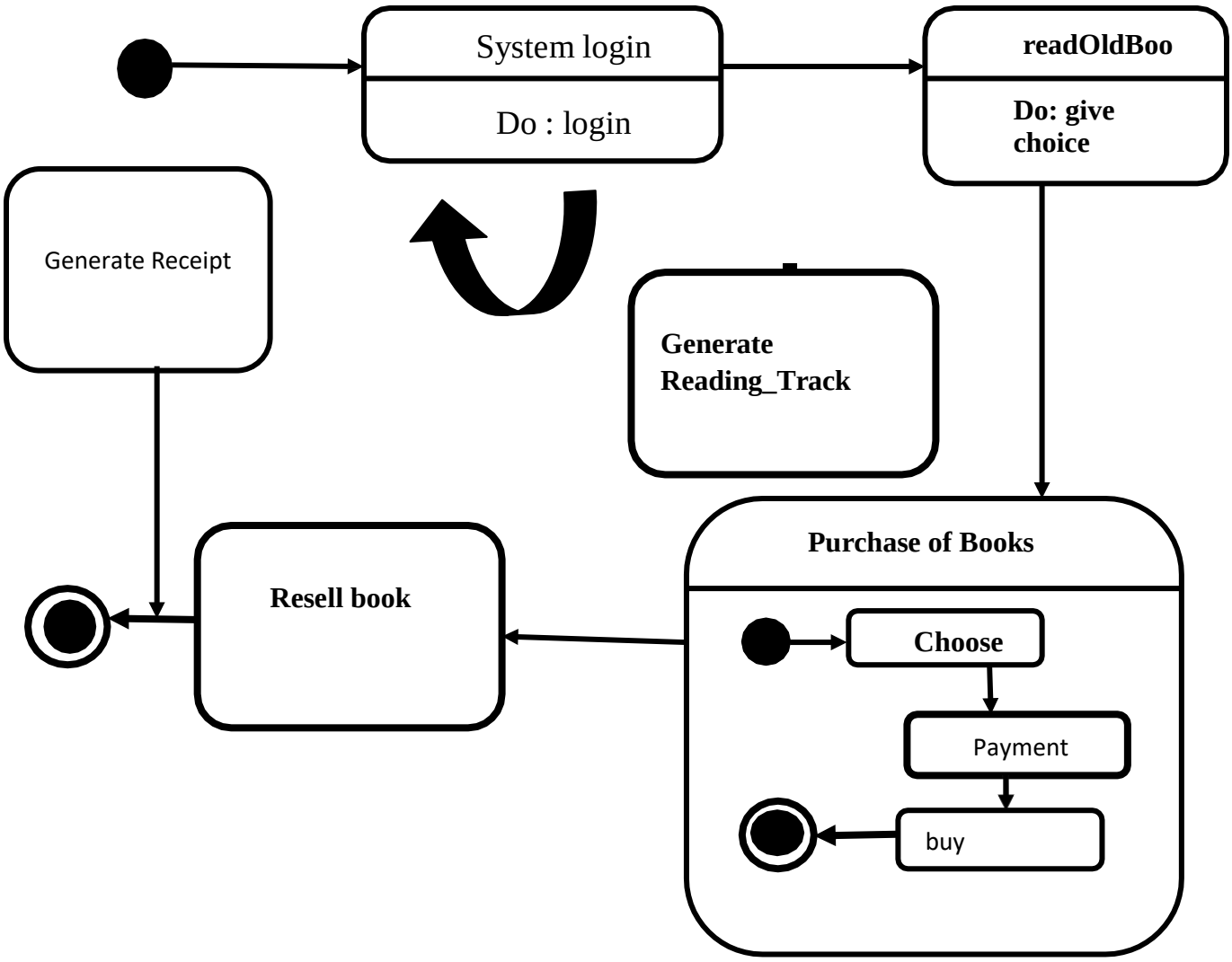


1

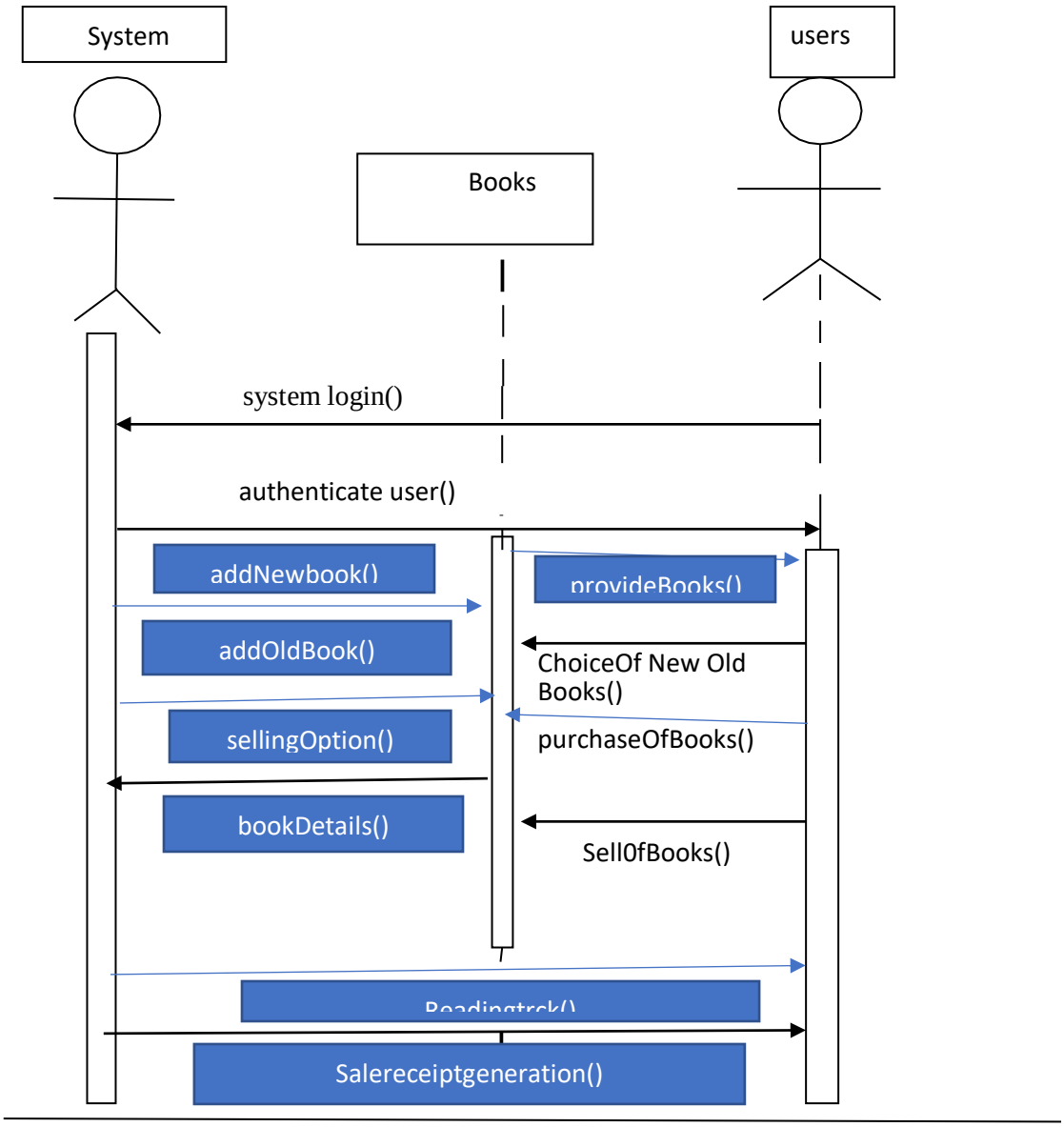
6.2. USE CASE DIAGRAM : Shows interaction and relation with the system of different use cases.



6.3. STATE TRANSITION DIAGRAM



6.4. SEQUENCE DIAGRAM : These diagrams design, document and validate the the architecture, interface and the logic of the system by describing the sequence of actions to be performed to complete a system or task. They provide a dynamic view of the system with time.



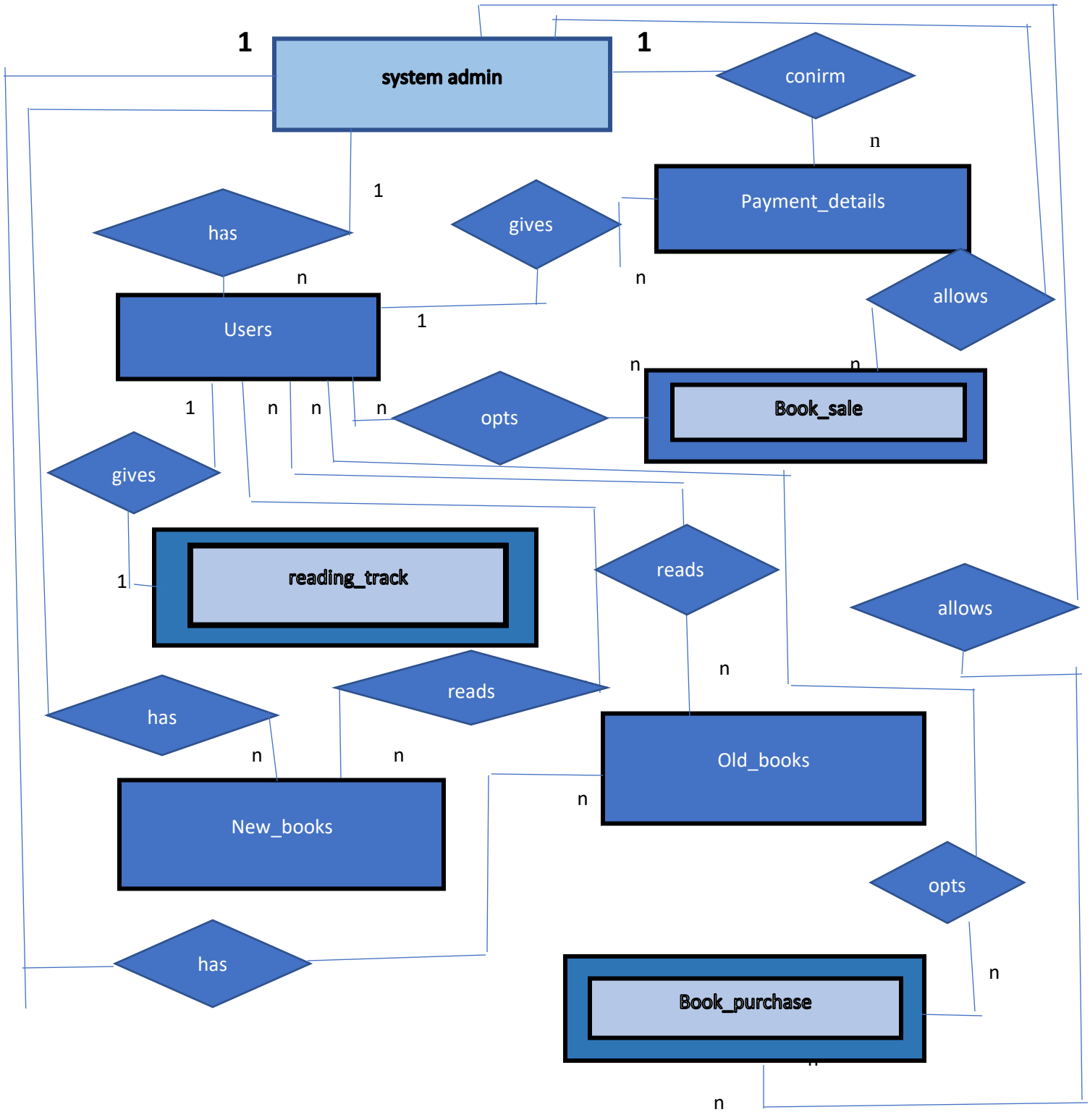
6.5.ENTITY RELATIONSHIP DIAGRAM:

Shows the complete structure to prepare the database of the system.

symbols	meanings
	Strong entity[table with primary key]
	Weak entity[table without primary key
	relation

: attributes

: connectivities 1



7. SYSTEM TESTING

Software testing is a crucial element and it represents the ultimate review of specification design & coding. There are two types of test approaches. They are-

- Black Box Testig
- White box testing

When computer software is considered, *black-box testing* alludes to tests that are conducted at the software interface. Black-box tests are used to demonstrate that software functions are operational, that input is properly accepted and output is correctly produced, and that the integrity of external information (e.g., a database) is maintained.

Other Testing methods are:

➢ Unit testing:

Unit testing focuses verification effort on the smallest unit of software design—the software component or module. Here each module is tested individually and it was ensured that all the modules function as required.

Integrated testing:

Integration testing is a systematic technique for constructing the program structure while at the same time conducting tests to uncover errors associated with interfacing.

The objective is to take unit tested components and build a program structure

that has been dictated by design. Here the tested modules is combined together and were tested to work properly as a group of interactive modules. The main purpose of this testing is to check the interface between the modules.

Validation testing:

Here the system is tested to see whether the system particular and as a whole met with therequirements of the client and the errors that occurred at this phase were noted.

- System testing:

System testing is actually a series of different tests whose primary purpose is to

Fully exercise the computer-based system Here the entire software is tested as a whole system and the errors found at this phase were noted and the whole system was also tested to be working according to the requirement.

The testing of system is done in Low Level design Document.

8. REPORT GENERATION

Three types of report generation is allowed in the document.

- ✓ Reading track of Registered users
- ✓ Sale Receipt
- ✓ Purchase receipt

9. FUTURE SCOPE

The following updations are earmarked as Future scope of the project:

- ∞ Book Authors to be connected with Readers.
- ∞ Writing skill improvement implementation.
- ∞ Broader range of sale manifesto to tbe developed.