VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belgaum -590014, Karnataka.

LAB REPORT

on

Object Oriented Modelling and Design

Submitted by

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in partial fulfillment for the award of the degree of

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in

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CERTIFICATE

This is to certify that the Lab work entitled "OBJECT ORIENTED MODELLING AND DESIGN" carried out by **PIYUSH DUBEY (1BM19CS221),** who is bonafide student of **B. M. S. College of Engineering.** It is in partial fulfillment for the award of **Bachelor of Engineering in Computer Science and Engineering** of the Visvesvaraya Technological University, Belgaum during the year 2022. The Lab report has been approved as it satisfies the academic requirements in respect of an **OBJECT ORIENTED MODELLING AND DESIGN - (20CS6PCOMD)** work prescribed for the said degree.

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Course Outcome

CO1	Ability to apply the knowledge of class, State & Interaction Modeling using Unified Modeling Language to solve a given problem.
CO2	Ability to analyze a System for a given requirement using Unified Modeling language.
CO3	Ability to design a given system using high level strategy.
CO4	Ability to conduct practical experiment to solve a given problem using Unified Modeling language.

College Information System:

Software Specification Requirement:

Lab - 1 7/9/20

Q) 1 System requirement specification for a college management system.

→ 1. Introduction

1.1 Purpose / Objective of document: to lay down a systematic strategical document specifying all requirements of various aspects of college management system.

1.2 Scope :- Covers all central and subsidiary elements in management system

1.3 Overview :- A college management excercises and embeds efficient functioning and working of a college.

2. General description :- A college works under various subdomains and all these domains need a head to govern a constituency of that department. a central governance is also needed to ensure all the departments and subdomain are performing efficiently & yielding good result.

3. Product features:

3.1 Admin :

3.1.1 Admission / Registration : deals with admission & register

3.1.2 : Staff : Admin takes care of adding new staff / employee

3.1.3 : Admin : can add a new user in this department

3.1.4 : Finance : Budget of college

3.1.5 : Scolarship

3.2 Employee :

3.2.1 : Personal information

3.2.2 : Attendance

3.2.3 : Salary

3.2.4 : Student information

3.3 Student :

3.3.1 : Personal information : name, date of birth, address

3.3.2 : Attendance

3.3.3 : Marks

3.3.4 : Fees

3.4 Department :

3.4.1 : Department name

3.4.2 : Established year

3.4.3 : Alumni database

3.4.4 : Faculty & HoD details

3.4.5 : Courses offered

3.4.5 : Companies invites & collaborations

3.5 Course :
3.5.1 : Offered by department
3.5.2 : Course details like credits, lectures, integrated, etc
3.5.3 : Course ~~de~~ faculty handlers

3.6 Scolarship
3.6.1 : Offering institution
3.6.2 : intake of students
3.6.3 : fee type

4 Functional requirements :

4.1 Register new students
4.2 Record attendance
4.3 Record internal & SEE marks
4.4 Record fee details of students
4.5 Register new teachers, faculty, etc
4.6 Register new user in admin
4.7 Register Hod details
4.8 Record course details
4.9 Record scolarship information
4.10 Register new courses
4.11 Generate reports and log files of system

5. Non-functional requirement : In this system authentication of user is an important factor. In this system user authentication will be done by login by user name and password & classification

Advanced Class Diagram:

1. An Admin handles Department, Placement and COE classes.
2. Each department has one or more staff, and is composed of various courses.
3. Staff can be either teaching or non-teaching
4. Each student can enroll to multiple courses and each course can be enrolled by multiple students
5. Each student gets Facilities of College which can include library or hostel

Advanced State Diagram:

1. College Information System
State diagram

A user has to enter valid credentials before logging into the website. After logging in he can view Information. He can click on profile icon to see his profile or can register to an elective. In course Registration he can select the available courses and then logOut.

Advanced UseCase Diagram:

Advanced UseCase Diagram:

Advanced Sequence Diagram:

Advanced Sequence Diagram:

Advanced Activity Diagram:

1. College Management System

Activity Diagram

UML:

Hostel Management System:

Software Specification Requirement:

Lab - 2

2. Hostel Management System

Problem description →
Design UML diagrams for Hostel Management System with system requirement specification

Introduction :-

Purpose :-
The purpose of this document is to unite functional and nonfunctional, user or system requirements that represents the characteristics of hostel management system.

Scope :-
To design a system which provides a maximum services in single software based system

General description :-

The purpose of hostel management system is to carry out different operations in hostel. The system will provide ease of use to staff as well as students by performing all work on computer.

by user type. Users will get access to the system as permissions are classified for that type of user.

The system has a consistent interface so that the system is easy to use and in the interface of our system buttons and forms are used to enter data related to a specific module.

6 Hardware constraints

6.1 System : i5 or more
6.2 RAM : 1GB or above
6.3 Hard disk : 100 GB minimum
6.4 Operating system : Windows 10 & above
6.5 Software platform : Visual Studio, Apache, PHP, SQL, etc

7 Appendices & remarks :-

7.1 microsoft.net : references
7.2 bmsce.ac.in : conclusion web output
7.3 webcampus.bmsce.ac.in : campus portal
7.4 courses.bmsce.in : course registration portal.

Advanced Class Diagram:

STAR UML:

1. An hostel is composed of Rooms and Mess.
2. It employs wardens.
3. Rooms can be either SingleAccomodation for MultipleAccomodation.
4. An admin can add hostels, add students and wardens.
5. Each student can stay in the hostel and make payments through some payment modes and also give feedback.

StateDiagram:

Advanced State Diagram:

Advanced State diagram
Login
do/check username & password
invalid
on view
Display
do/show options
Select
entry/show available rooms
View
entry/show list of hostels
assign : [rooms available]
[not alloted]
Allot
do/allot the room selected
do/navigate around pages
make payment
Pay : Payment
Logout
do/unassign credentials
Payment
Login
do/authenticate user
correct
Input
do/enter card details
error
OTP
do/generate
valid
cost deducted
Success
do/display successful message
leave
Logout
do/unassign credentials

STAR UML:

After entering the website a person needs to logIn to continue. On successfully Logging In he will be redirected to the homePage. Now he can either log out or still stay in the website. He can select the room that he wants to stay in the hostel. He first needs to select the block, then select the room, complete the payment. On successful payment he needs to be allocated the room. Admin can also log in to the website. He can view the mess list. Select and edit the menu of the mess. He can also view the monthly expenditure of the mess.

Advanced UseCase Diagram:

2. Hostel Management System

Use Case

STAR UML:

Advanced Sequence Diagram:

Advanced Activity Diagram:

2. Hostel management System
student
database
payment
login
fail
book room
check availability
[NA]
[A]
allot room
make payment
error message
generate bill
Calculate cost

student
database
payment
login
fail
[correct credentials]
book room
check availablity
[not available]
[available]
allot room
make payment
error message
generate bill
[payment fail]
[payment success]
calculate cost

Coffee Vending Machine:

Software Specification Requirement:

4. Coffee Vending Machine

Problem statement :- Create a SRS document for coffee vending machine, that lists all requirements and actors.

Introduction :

Purpose :-
The purpose of a proposed system is to prepare a system that will be able to prepare coffee by processing all its required ingredients as specified by the user.

Scope :-
The coffee vending machine will eliminate the manual coffee processing staff appointment and ~~in~~ human dependency to get customer desired product.

Overview :-

The system consists of a cash box money collection, a panel for ingredients selection, a mixer/dispenser and a comprehensive user interface.

~~Functi~~

Requirements :

- Details about coffee should be available such as name, list of ingredients & process can be added.
- A good vending interface which has a collection of buttons which trigger different actions of click
- Service Provide should be able to edit the details of buttons like name, function or click status
- Buttons can have subclass such as coffee selection button & payment button.
- Cashier contains details of purchase, accepts money ~~&~~ from consumers & give bill ~~for~~ for the above
- Coffee maker has details of coffee & processes that was sent.
- Coffee maker should start making coffee & dispensing.

Advanced Class Diagram:

1. A Coffee Machine is composed of a coffee dispenser.
2. Each dispenser is composed of a milk dispenser and water dispenser.
3. Milk and water dispensers are derived from dispenser class.
4. Menu is composed of many items.
5. A customer can get coffee from the coffee vending machine.
6. He can pay through the payment interface.

Advanced State Diagram:

Person can first select Options to view the menu. Once the flavor is chosen the machine needs to wait for a person to add the coins into the machine. Once a sufficient amount of money is added to the machine. Selected Items should be dispensed after which the change should be returned back. While dispensing an item first handicker should set the row and then the column. On reaching to the correct position selected flavor should be dispensed.

Advanced UseCase Diagram:

4. Coffee Vending System
Use case
Customer
Buy item
Choose Item
Take Item
Payment
Dispense Change
Dispense Coffee
Capucchino Dispense
Americano Dispense

CoffeeVendingMachine
«include»
Buy Item
Choose Item
«include»
«extend»
Take Item
Payment
Customer
«extend»
Dispense Change
Dispense Coffee
Capucchino Dispense
Americano Dispense

Advanced Sequence Diagram:

Advanced Activity Diagram:

Customer
Coffee dispenser
Payment
[is available]
check payment
accept coins
select coffee
calculate amount
error message
[not available]
insert coins
[amount=price]
make coffee
received amount
collect coffee
dispense coffee
change:[amount>price]
get change

OBJ

Online shopping system:

Software Requirement Specification:

5. Online Shopping System

Problem statement :- An end to end merchant, customer online shopping system should support to both of them and connecting them and connecting them with system as a mediator / medium.

Requirements :-

(i) The system should address two types of user - merchant & customer

(ii) A user profile common to all user including name, email, etc.

(iii) A support form to request for any issue whether technical or non technical.

(iv) A home section for merchant UI categorized to product & services is editable by merchant after some fixed amount of time

(v) The quantity is auto moderated & the merchant can locally set them too.

(vi) A product section includes product name, name of product / price, etc

- For customer, an organized home section with a search bar with various filters applicable.
- The customer should be able to view details of product on clicking on it and there should be details of delivery date, add to cart or buy now options.
- The purchased ~~option~~ products are entered to users purchases & user can view them to track based on availability.
- The track section for user should include details of product's location with time & delivery date.

Advanced Class Diagram:

1. Each account is composed of a shopping cart.
2. Users can add products to the shopping cart.
3. A product can be of type Men or Women or Kids or Home products.
4. Home products can contain Kitchen, Electrical, Sanitary, Decor products.
5. An account can be active or inactive or blocked.
6. Gender of a user can be male or female or others.
7. An user can make any order and then pay for it through any payment method.
8. User can know about his order using the order status.

Advanced State Diagram:

An user has to enter valid credentials to log in. Once he logs in he can either directly logout or he choose an item in the catalog. After selecting an item he can add them into the cart and place the order directly or he can also change the quantity of items to be added. Once done with choosing with the order, he can go for payment methods and make a payment to final make an order.

Advanced UseCase Diagram:

Advanced Sequence Diagram:

sd OnlineShoppingSystem
Customer
Website
Product
Cart
Payment
1 : Validate login
2 : Login successful
3 : Search product
4 : Product found
5 : Add product to cart
6 : Product added
7 : Order
8 : Request payment
9 : Do payment
10 : Validate payment
11 : Successful
12 : Order placed

Online Shopping System:-
Customer
Website
Product
Cart
Payment
1: Validate login
2: Login successfully
3: search product
4: product found
5: Add pdt to cart
6: Pdt added
7: Order
8: Request payment
9: Do payment
10: Validate payment
11: Successful
12: Order placed

Advanced Activity Diagram:

Stock Maintenance System [Inventory]:

Software Requirement Specification:

3. Stock Maintanence System (Inventory)

Problem Description :-

Design a SRS document for stock maintainence system with requirement specification

Introduction :-

Purpose :-

The purpose of this document is to highlight functional & non functional requirement of system that represents the characteristics of stock maintainence system

scope :-

The stock managment system will allow employees to maintain information of the items available in a store and generate reports based on amount of sales.

General description :-

The system has a window based desktop interface to allow employee to maintain item information, total sales, availability and allows customers to view the availability in a restricted mode.

2) Functional requirements:-

(i) Employee can maintain the inventory, add change or delete the information related to products

(ii) Manager can change, delete or place a purchase order.

(iii) Manager can view the stock availability and analyze the sales.

(iv) Administrator can view and generate report after a transaction

(v) Customer can view the availability of goods in stock in a restricted mode.

Non functional requirements:-

(i) Authentication :- Managers, admins, customers can login and perform tasks efficiently

(ii) Easy to use interface

(iii) Her response type

(iv) Fast database update and data retrieval

(v) Accurate request processing

Advanced Class Diagram:

UNREGISTERED

An user has certain roles and permissions. A permission consists of Payment as well as it is made up of stocks, products, stores and etc. A customer can buy a stock or a product and make payment for the same.

State Diagram:

An user must login in by entering valid credentials before accessing the functionalities of the website. After Log in he will be redirected to the home page. From there he directly log out or purchase stocks. When he purchases some stock he needs to enter the quantity and then the dealer should check the availability of the stock and sell it to the customer after accepting the payment from the same. Admin should also maintain the status the stocks.

Advanced Use Case Diagram:

Advanced Sequence Diagram:

Advanced Activity Diagram:

Accept user login
request validation
wait for response
network
receive confirmation
system ready to receive orders
order received
check inventory
[stock exists]
Accountant
Inventory Manager
Sales Agent
Validate Payment
Update Inventory
Generate bill
Deliver item

Railway Reservation System:

Software Requirement Specification:

6: Railway Reservation System :-

Problem statement :-

A dynamic railway reservation system providing real time details of availability to user & accepting the booking of tickets online with flexible payment options.

Requirements :-

- The home selection should include the current on-platform train detail
- A user profile of name, phone, email, photo etc.
- A search bar to search for availab trains or when should be they available with integrated user location or providing options for user to apply the filter.
- Each train is associated with scheduled details and user can put them to watch, alert list to keep an eye on them for availa
- The user can buy tickets by selecting no of passengers & seat type

→ In case of e-tickets, it includes all the necessary details & should be accessible from e-ticket menu.

→ In case of hard copy of tickets, user is alerted to go to railway station & get the ticket by authorizing the ticket generation.

Advanced Class Diagram:

A train ticket can either be a general one or a tatkal one. Passenger has to buy a ticket if he wants to travel through a train. Passenger buys a ticket and makes a payment through some particular bank.

Advanced State Diagram:

To log in to the website an user has to enter his phone number and then enter a valid otp. After log in he can choose a train through which he wants to travel. After choosing a train he can select a payment method and confirm his ticket.

Advanced UseCase Diagram:

RailwayReservationSystem
Register
Login
Check Availability
Book Ticket
Fill Details
Make Payment
Cancel Ticket
Online
Offline
Refund Money
User
Admin
Railway System
Bank
«include»
«extend»
«include»
«extend»

Advanced Sequence Diagram:

Advanced Activity Diagram:

Graphical Editor System:

Software Requirements Specification:

7. Graphical Editor System

Problem Statement :-
A sleek, user friendly drag drop graphical editor to create canvas, edit the same and export it in the provided format.

Requirements :-

→ The systems should have basic tab bar with default config.

→ The opening window lists the recent work with an open as well as new option.

→ Either case, on opening canvas a toolbar of various available features is to be visible on left side of section

→ On drag & drop, the feature is added to canvas & the further design menu should pop up on having on the feature.

→ The design menu is one to one and can design specific feature. colour, border file, resize, etc.

→ The canvas should support redo & undo operation, also copy, paste, cut, delete of feature or features.

→ The export button should lead user to export the current canvas in available formats of .png, .jpg, .jpeg.

→ Each feature is associated with its position & design details

Class Diagram:

A Graphical Editor is made up of Documents. Each document consists of sheets. Each sheet has a group. And a group has objects. An object can be a Text object or a zero dimensional object or a one dimensional object or a two dimensional object. Point is a zero dimensional object
. Line and arcs are two dimensional objects and circle, rectangle, ellipse fall under two dimensional objects.

Advanced State Diagram:

A person can open an existing document or create a new document. He can click on display tools to select a drawing tool. He can drag and drop the required objects and latersav the file by giving it an appropriate name.

Advanced UseCase Diagram:

Advanced Sequence Diagram:

1, 2, 3, 4, 5, 6, 7

7: Graphics Editor System

Advanced Activity Diagram:

User
Editor
Open File
[file exists]
Create new file
no
yes
Load existing file
Select item
erase tool
drawing tool
Erase diagram
Draw
job not done
text
diagram
Write text
Draw figure
Save file
job done
Close file