

SOFTWARE ENGINEERING LAB

Paper Code: ETCS-353
Paper: Software Engineering Lab

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Tool Required: Rational Rose Enterprise Edition/ StarUML

Case Studies : Problem Statements

- (i) Online Banking System
- (ii) Clinic Management System
- (iii) Airline Reservation System
- (iv) Warehouse Management System
- (v) Library Management System
- (vi) School bus operation System

(i) Online Banking System

Online Banking System project captures activities performed by different roles in real life banking which provides enhanced techniques for maintaining the required information upto-date, which results in efficiency. The project gives real life understanding of Online Banking System and activities performed by various roles in the supply chain.

- **Login Process:** This module allows valid customers to access the functionalities provided by the bank.
- **Balance Enquiry:** This module maintains the balance details of a particular account.
- **Update Profile:** This module allows the customer to update profile of their account.
- **Funds Transfer:** This module allows the customers to transfer funds from one account to another within the same bank.
- **Change of Password:** This module allows customers to change their password.
- **Mini Statements:** This module allows customers to view their transaction details.

(ii) Clinic Management System

There is a Clinic Management system. An assistant of the doctor and the doctor himself uses the system. The system keeps information about all the patients visiting the clinic. Each patient is

charged a fee of Rs 100 on his visit to the clinic. If the patient revisits the clinic within 5 days he is not charged any fees but after that he is charged again. The clinic also provides the facility of medicines which is optional for the patients to take. Each patient is provided with a prescription and receipt on his each visit.

The system stores the following information:

- Personal data of each patient visiting the clinic must be recorded.
- The different medicines available in the store with their manufacturing date and expiry date.
- Also information like the company which is manufacturing that medicine, etc..
- Information like who are all the patients who have got treatment from that clinic and against what disease.

(iii) Airline Reservation System

Ticket reservation system for airlines has to be developed.

The system should contain the following features:

- Search for information about the flight by means of flight number and destination
- While displaying information about the flight it has to provide availability of seats.
- While reserving tickets the system obtain following information from the user
Passenger Name, Sex, Age, Address.
Credit Card Number, Bank Name.
Flight number, Flight name, Date of Journey and number of tickets to be booked.
- Based on the availability of tickets, the ticket has to be issued. The ticket issued should contain the following information –ticket number, flight no, flight name, date of journey, number of passengers, sex, age and departure time.
- Cancellation of booked tickets should be available.

(iv) Warehouse Management System

The system will support warehouse management. The company ordering the system, ACME warehouse Management Inc, specializes in supporting its customer with warehouses places all over the nation. Examples of customer are companies that need space to store their products before they are shipped or companies that need local warehouses without having local offices. ACME is already a specialist in storing different kinds of items and in the use of trucks to redistribute the items. ACME plans to grow and now needs an information system with which they can grow. The idea is to offer the customers warehouse space and redistribute services between different warehouses with full computer support. The service includes redistribution both within a warehouse and between warehouses, all dictated by customer needs. All kinds of items may be stored in the warehouses., Which means that it is important to differentiate between certain kinds of items; for example some items must not come into contact with other items (such as industrial chemicals and foods.)

The following people will be using the system in some way or another

- Foreman responsible for one warehouse;
- Warehouse worker works in a warehouse, loading and unloading
- Truck driver drives a truck between different warehouses
- Forklift operator drives a forklift in one warehouse
- Office personnel Receives orders and requests from customers
- Customers own the items in the warehouses and give instructions as to where and when they want the items.

It is fundamental to the ACME system that it should be as decentralized, as possible and that all persons involved should be reachable at all times. Therefore the truck drivers should have communication devices for getting their orders and they must be able to communicate with the foreman or the office. This means that we also need a radio communication network a system that should not be developed by us but bought separately. The warehouse workers loading and unloading should use a barcode reader when handling the items in order to be as efficient as possible. This means all items must be marked when inserted in the warehouse system by a warehouse worker. This marking must at the same time give information about the item to the information system. The foreman should be able to work several items at the same time, so they will probably need a window based terminal. They are responsible for effecting the redistribution orders from the office. When the customer wants to do something with his items, he will contact the office , which in turn submits redistribution orders to the system. Eventually if the system is to work well, ACME plans to give their customers terminals so that they can interact directly with the system.

(v) Library Management System

The library management system is software, which automates the job of a librarian.

- The user can inquire about the availability of a book in which he can search by entering the author's name or by entering the title of the book.
- The user can borrow a book. He must provide the username and the card number, which is unique and confidential to each user. By confirming the authenticity of a user, the library management system provides information about the number of books already borrowed by the user and by referring to the database whether the user can borrow books or not. The library management system allows the user to enter the title and the author of the book and hence issues the book if it is available.
- By entering the user details and the book details the user can return the borrowed book.

(vi) School Bus Operation

A New Branch School District operates a fleet of 40 buses that serve approximately 1,000 students in grades 1 to 12. The bus operation involves 30 regular routes, plus special routes for activities, athletic events, and summer sessions. The district employs 12 full time drivers and 25 to 30 part-time drivers. A dispatcher coordinates the staffing and routes and relays messages to drivers regarding students and parents who call about pickup and drop-off arrangements.

The System stores information like:

- Personal info of each student using the facility
- Information regarding each bus run by the school
- Personal info of Bus Employees
- Information like which bus is running on which route, which students are using the services of which bus etc.,

S.No	Lab No.	Experiment(s) to be performed
1.	Lab 1	Prepare Software Requirement Specification Sheet (SRS) for suggested system.(choose any 1 of the case studies mentioed).
2.	Lab 2	Function oriented diagram: Data Flow Diagram (DFD) (0-level,1-level & data dictionary) and Structured chart.
3.	Lab 3	Perform User's view analysis: Use case diagram.
4.	Lab 4	Draw Structural view diagrams: Class diagram, object diagram.
5.	Lab 5	Draw Behavioral view diagrams: State-chart diagram, Activity diagram
6.	Lab 6	Draw Behavioral view diagrams: Sequence diagram, Collaboration diagram
7.	Lab 7	(i) Draw Structural view diagram: Package diagram (beyond the syllabus) (ii) Draw Behavioral view diagram: Use-case diagram(beyond the syllabus)
8.	Lab 8	Draw implementation view diagram: Component diagram
9.	Lab 9	Draw Environmental view diagram: Deployment diagram
10.	Lab 10	To perform various testing using the testing tool unit testing, integration testing for a sample code of the suggested system.
11.	Lab 11	To Perform Estimation of effort using FP Estimation for chosen system.

12.	Lab 12	To Prepare time line chart/Gantt Chart/PERT Chart for selected software project.
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Text Books:

1. K.K. Aggarwal & Yogesh Singh, —Software EngineeringI, New Age International, 2005
2. Pankaj Jalote, —An Integrated Approach to Software EngineeringI, Second Edition, Springer.