LAB REPORT

Submitted by

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Under the Guidance of

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Assistant Professor, DSBS

In partial satisfaction of the requirements for the degree of

BACHELOR OF TECHNOLOGY
in
COMPUTER SCIENCE ENGINEERING

with specialization in Big Data Analytics

SCHOOL OF COMPUTING

COLLEGE OF ENGINEERING AND TECHNOLOGY

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

KATTANKULATHUR - 603203

JUNE 2022

SRM INSTITUTION OF SCIENCE AND TECHNOLOGY
KATTANKULATHUR-603203

BONAFIDE CERTIFICATE

Certified that this lab report titled **"LOCAL TRAIN TICKET BOOKING SYSTEM"** is the Bonafide work done by NAMIT LODH (RA2011027010116) who carried out the lab exercises under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other work.

SIGNATURE

Dr. A. Shobanadevi

SEPM – Course Faculty

Assistant Professor, DSBS

ABSTRACT

Local Train Ticket Booking System is basically concerned with the reservation of local train tickets to the passengers of metropolitan cities. This Ticket Booking system is completely coded in C Programming language. This system ensures the user to view trains of his desired destination, Reserve the ticket, Cancel the ticket etc. This System mainly used in the Travelling Agency who provide the train ticket reservation to passengers. It can also be used in Android devices also. The existing system is highly manual involving people standing in queue and waiting to get a ticket and also involving lot of paper work and calculation and therefore may be erroneous. This has lead to inconsistency and wastage of time of passengers. To overcome this problem we have designed a computerized system. The computerization of booking a ticket will reduce a lot of time and also reduce the load of paperwork on administrative staff. These system is designed in such a way that passenger can book a ticket as well as cancel the ticket of any train he wants to take.

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LIST OF ABBREVIATIONS

1. **WBS –** WORK BREAKDOWN STRUCTURE
2. **API –** APPLICATION PROGRAMMING INTERFACE
3. **SWOT –** STRENGTHS, WEAKNESSES, OPPORTUNITIES, AND THREATS ANALYSIS
4. **RMMM –** RISK MITIGATION, MONITERING AND MANAGEMENT
5. **HTML –** HYPERTEXT MARKUP LANGUAGE
6. **ER –** ENTITY RELATIONSHIP
7. **DFD –** DATA FLOW DIAGRAM

Department of Indian Railways

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	1
Title of Experiment	To identify the Software Project, Create Business Case, Arrive at a Problem Statement
Name of the candidate	NAMIT LODH
Team Members	SARATH RADHAKRISHNAN , AKAASH RAM
Register Number	RA2011027010116
Date of Experiment	15/03/2022

Mark Split Up

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

Aim

To Frame a project team, analyze and identify a Software project. To create a business case and Arrive at a Problem Statement for the <title of the project>

Team Members:

S. No	Register No	Name	Role
1	RA2011027010116	NAMIT LODH	Lead/Rep
2	RA2011027010113	SARATH RADHAKRISHNAN	Member
3	RA2011027010126	AKAASH RAM	Member

Project Title : Local Train Ticket Booking Project

Project Description

The passengers are required to wait in the queue for booking the tickets. Booking ticket via ticket counter after killing time on the ticket window, may sometimes lead to missing up of the train as well. The person just need to login this application on their devices which is working on android platform and then while sitting at their home, they can book tickets for all the local trains which they wish to travel.

Business Case

<Incorporate the Business Case template>

ONE PAGE BUSINESS CASE TEMPLATE

DATE	15/03/2022
SUBMITTED BY	NAMIT LODH, SARATH RADHAKRISHNAN, AKAASH RAM
TITLE / ROLE	**Local Train Ticket Booking Project**

THE PROJECT

In bullet points, describe the problem this project aims to solve or the opportunity it aims to develop.

- The passengers are required to wait in the queue for booking the tickets.
- Booking ticket via ticket counter after killing time, may sometimes lead to missing up of the train as well.
- The person just need to use this application on their devices, so they can book the tickets easily.

THE HISTORY

In bullet points, describe the current situation.

- Most of the people facing problems while booking local train because of standing in queue for long time.
- Fill in the form about number of people travelling, destination.
- The seat number and the receipt will be issued.
- So much task has to done for booking local train tickets.

LIMITATIONS

List what could prevent the success of the project, such as the need for expensive equipment, bad weather, lack of special training, etc.

- Security and ticket duplication issue.
- Railway fare and rates must be updated regularly.

APPROACH

List what is needed to complete the project.

- The user need to select the source and destination of the travel.
- The user can also opt whether it is single journey or double-way journey.
- The user can select the class for the travel.
- The admin maintains the user account balance and shows the history of journey tickets booked by the user.

BENEFITS

In bullet points, list the benefits that this project will bring to the organization.

- It helps passengers get tickets with ease.
- Passengers need not stand in queues for getting ticket.
- No need to print tickets.

Result

Thus, the project team formed, the project is described, the business case was prepared and the problem statement was arrived.

Department of Indian Railways

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	2
Title of Experiment	Identification of Process Methodology and Stakeholder Description
Name of the candidate	NAMIT LODH
Team Members	SARATH RADHAKRISHNAN, AKAASH RAM
Register Number	RA2011027010116
Date of Experiment	22/03/2022

Mark Split Up

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

Aim

To identify the appropriate Process Model for the project and prepare Stakeholder and User Description.

Team Members:

Sl No	Register No	Name	Role
1	RA2011027010116	NAMIT LODH	Rep/Member
2	RA2011027010113	SARATH RADHAKRISHNAN	Member
3	RA2011027010126	AKAASH RAM	Member

Project Title: Local Train Ticket Booking Project

WATERFALL METHODOLOGY:-

The Waterfall methodology is a sequential development process that flows like a waterfall through all phases of a project (analysis, design, development, and testing), with each phase completely wrapping up before the next phase begins.

It is said that the Waterfall methodology follows the adage to “measure twice, cut once.” The success of the Waterfall method depends on the amount and quality of the work done on the front end, documenting everything in advance, including the user interface, user stories, and all the features’ variations and outcomes. With the majority of the research done upfront, estimates of the time needed for each requirement are more accurate, and this can provide a more predictable release date.

REQUIREMENTS:-

The Waterfall methodology depends on the belief that all project requirements can be gathered and understood upfront. The key aspect is to gather all customer requirements at the beginning of the project.

So we have collected the requirements for the users which will save their time from standing in queue for booking local train tickets and have a better experience with booking it online.

DESIGN:-

Here, software developers design a technical solution to the problems set out by the requirements, including scenarios, layouts, and data models. First, a logical design is created that describes the purpose and scope of the project, the general traffic flow of each component. Once this is complete, it is transformed into a physical design using specific hardware and software technologies.
We have the physical design of the website and on the way to implement it on the logical or coding part of the website.

IMPLEMENTATION:-

The implantation phase is when programmers understood the requirements and specifications from the previous design phase and then produce the actual code. If significant changes are required during this stage, this may mean going back to the design phase. We have decided what type of filters are needed for customers to travel their destination and according to that we are going to filter out the train routes for customers to travel their destination.

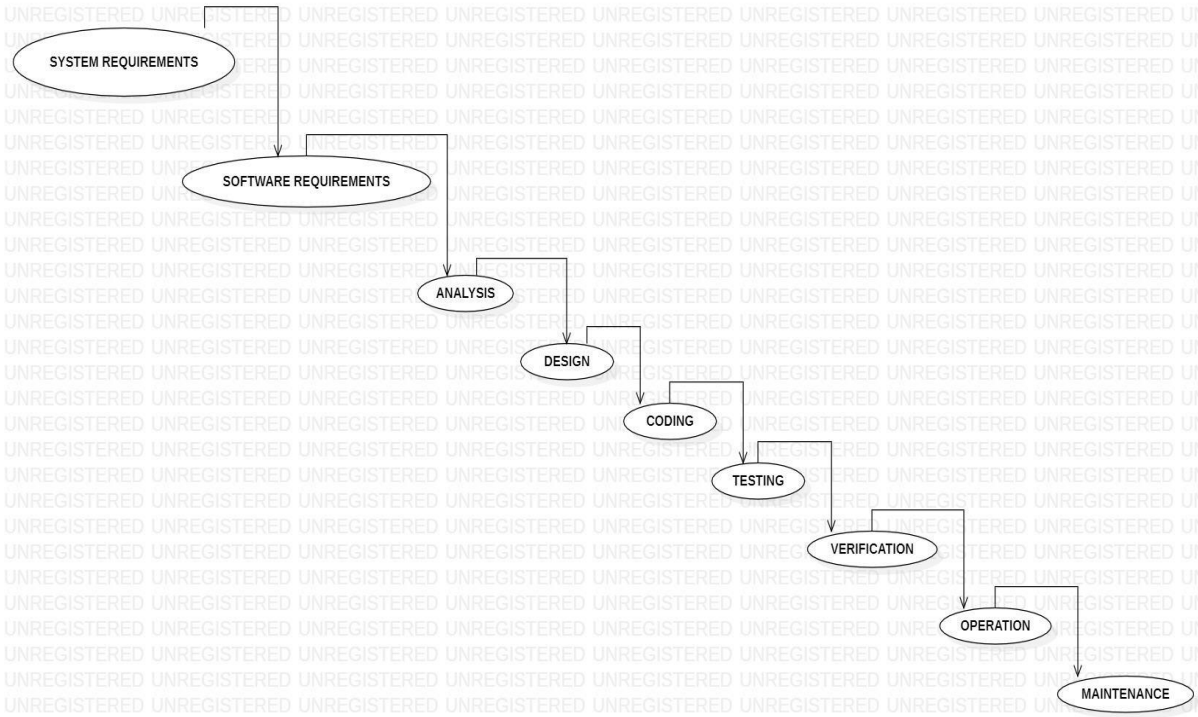
VERIFICATION:-

This phase is when the customer reviews the product to make sure that it meets the requirements laid out at the beginning of the waterfall project. This is done by releasing the completed product to the customer.
Here we will be trying our website to see if everything works completely fine, whether the filters for local trains routes are working properly, whether the website is opening smoothly or not.

MAINENANCE:-

Once the software has been released to customers, the maintenance phase begins. As defects are found and change requests come in from users, a production team will be assigned to take care of updates and release new versions of the software.
We will be maintaining and updating the website if there are any latest trains running or the new routes have been developed with new stations where customers want to go.

WATERFALL METHODOLOGY DIAGRAM:



Incorporate information to below table regarding stakeholders of the project:

Stakeholder Name	Activity/ Area /Phase	Interest	Influence	Priority
OWNER	Making decisions about the activities of the business and providing funding to enable it to start up and grow.	High	High	High
TEAM MEMBERS	Wants to earn high wages and keep their jobs; responsible for developing the front end of the website and filtering the trains routes according to the user's preference.	High	High	High
SPONSER	Validates the project and authorizes the Project Manager to deliver results Offers the needed resources, time, and scope;the one who will be helping the website grow in different cities and areas.	Medium	High	Medium
LOCAL AUTHORITIES	They really do know their communities best. Keeping in touch with them has helped us gain funding to improve train services and facilities.	Medium	High	Medium
LEGAL EXPERTS	Managing the legal actions for the website; help us with any API violations from source website.	High	High	High
INVESTORS	Providing capital; investing the money , time to develop the website.	Medium	Low	Medium
SUPPLIERS	Managing the supply chain and profits ; who will be giving the shoes to reflect on our website.	High	High	High
END USERS/ AUDIENCE	Booking tickets and services and give feedback to businesses; who will be booking tickets to destination.	Low	Low	Low

Result

Thus the Project Methodology was identified and the stakeholders were described.

Department Of Indian Railways

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	3
Title of Experiment	System, Functional and Non-Functional Requirements of the Project
Name of the candidate	NAMIT LODH
Team Members	SARATH RADHAKRISHNAN, AKAASH RAM
Register Number	RA2011027010116
Date of Experiment	05/04/2022

Mark Split Up

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

Aim

To identify the system, functional and non-functional requirements for the project.

Team Members:

S No	Register No	Name	Role
1	NAMIT LODH	RA2011027010116	Rep/Member
2	SARATH RADHAKRISHNAN	RA2011027010113	Member
3	AKAASH RAM	RA2011027010126	Member

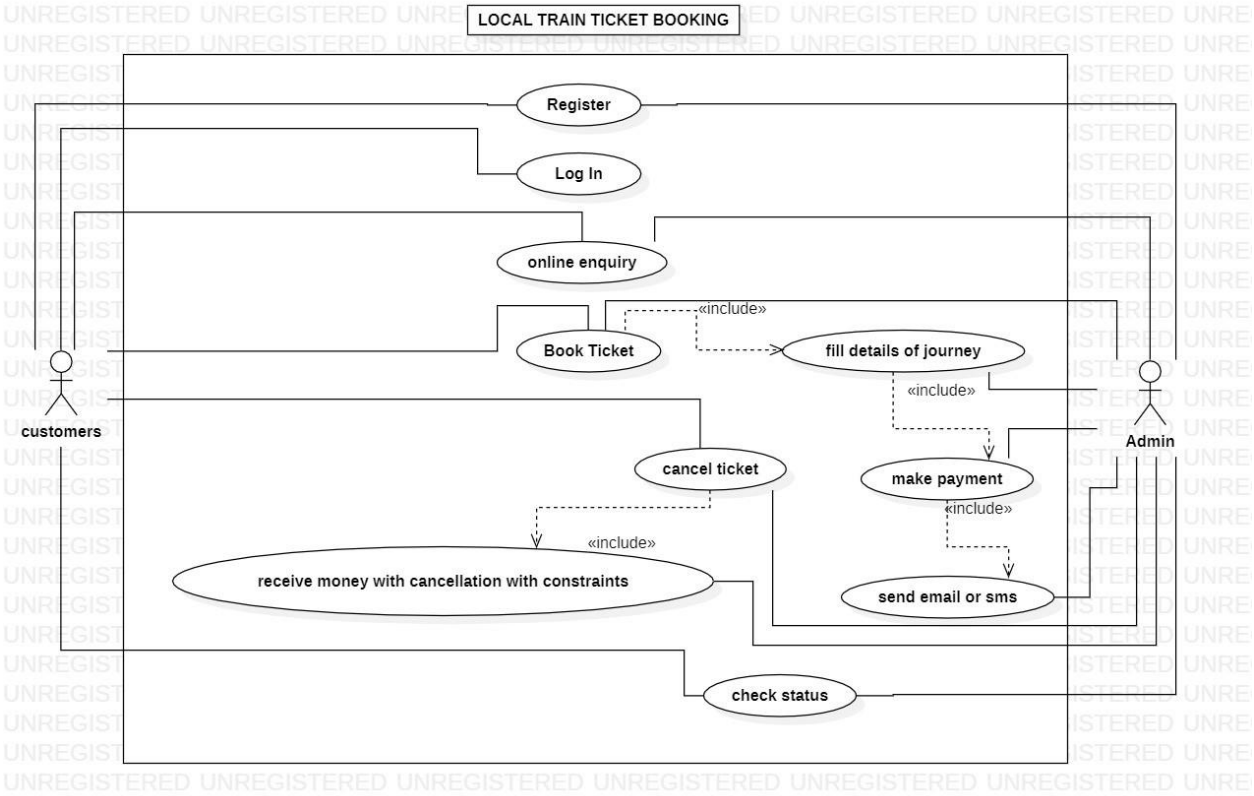
Project Title: LOCAL TRAIN TICKET BOOKING

System Requirements

- Good bandwidth
- Computer, laptop, Mobile
- Proper connections by railways
- Communication through different stations network
- Good hardware for the smooth functioning of the website
- Proper output as per requirements
- HTML, CSS

Functional Requirements

USE CASE DIAGRAM for the requirement:



User point of view:

- Book tickets according to their plan including the return journey
- Make payments according to their travelling
- Check the booked tickets
- View the booking details of the journey
- Check the account balance

Admin point of view:

- Add new users
- View transactions made by users of booking
- Making the website engaging
- Making sure website runs smoothly
- Checking user's plan to show appropriate trains with timings

Non-Functional Requirements

Scalability- Multiple users can book tickets at the same time
Reliability- 24*7 available for users
Usability- Simple interface of the website
Serviceability- if any hazard occurs then the website will ask the user to wait
Back-up- System offers the efficiency of data back up
Manageability- Saving the tickets booked by users in the website
Modifications- Any details need to be modified by the user

Result

Thus the requirements were identified and accordingly described.

Department of Indian Railways

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	4
Title of Experiment	Prepare Project Plan based on scope, Calculate Project effort based on resources and Job roles and responsibilities
Name of the candidate	NAMIT LODH
Team Members	SARATH RADHAKRISHNAN, AKAASH RAM
Register Number	RA2011027010116
Date of Experiment	21-04-2022

Mark Split Up

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

Aim

To Prepare Project Plan based on scope, Calculate Project effort based on resources, Find Job roles and responsibilities

Team Members:

Sl No	Register No	Name	Role
1	**RA2011027010116**	**NAMIT LODH**	**Lead**
2	**RA2011027010113**	**SARATH RADHAKRISHNAN**	**Member**
3	**RA2011027010126**	**AKAASH RAM**	**Member**

1. Project Management Plan

Describe the key issues driving the project. **[Min 3 Focus Areas]**

Focus Area	Details
Integration Management	Governance Framework Project Team Structure Roles & Responsibilities of Team Change Management (Change Control, Issue Management) Project Closure
Scope Management	Scope Statement Requirement Management (Gathering, Control, Assumption, Constraint Stakeholder) Define Deliverable Requirement Change Control Activities and Sub-Tasks
Schedule Management	Define Milestones Schedule Control
Cost Management	Estimate Effort Assign Team Budget Control
Quality Management	Quality Assurance: Quality assurance will be managed including governance, roles and responsibilities, tools and techniques and reporting Quality Control: Specify the mechanisms to be used to measure and control the quality of the work products
Resource Management	Estimate and Manage the need People: People & Skills Required Finance: Budget Required Physical: Facilities, IT Infrastructure
Stakeholder	Identifying, Analyzing, Engaging Stakeholders
Communication Management	Determine communication requirements, roles and responsibilities, tools and techniques. [Type of Communication, Schedule, Mechanism Recipient]
Risk Management	Identifying, analysing, and prioritizing project risks

2. Estimation

2.1. Effort and Cost Estimation

Activity Description	Sub-Task	Sub-Task Description	Effort (in hours)	Cost in INR
Design the website(front end)	aligning the text and images and applying scroll effects	Designing the website's frontend i.e. designing the UI.	40	20000
Design the website(back end)	design the logic of the website and fixing the loop points	Designing the website's backend i.e. designing and keeping the website updated with the user's data and all the databases.	60	30000
Communication with each railway networks	Communication With each railway stations to get the updates	If any problems or construction in particular station will help customers to take the nearest station	20	10000
Train timings	Arrival and departure time for each and every stations	On daily basis train timings will be shown and according to that customers can book tickets.	10	5000
TOTAL			130	65000

Effort (hr)	Cost (INR)
1	500

2.2. Infrastructure/Resource Cost [CapEx]

< OneTime Infra requirements >

Infrastructure Requirement	Qty	Cost per qty	Cost per item
PCs	3	70000	210000
server	10	50000	500000

2.3 Maintenance and Support Cost [OpEx]

Category	Details	Qty	Cost per qty per annum	Cost per item
People	Network, System, Middleware and DB admin Developer , Support Consultant	3	2,000,000	6,000,000
License	Operating System Database Middleware IDE	10	10000	100,000
Infrastructures	Server, Storage and Network	20	20000	400,000

3. Project Team Formation

3.1. Identification Team members

Name	Role	Responsibilities
NA	Key Business User (Product Owner)	Provide clear business and user requirements
Namit	Project Manager	Manage the project
Sarath	Business Analyst	Discuss and Document Requirements
Namit	Technical Lead	Design the end-to-end architecture
Akaash	UX Designer	Design the user experience
Akaash	Frontend Developer	Develop user interface
Namit	Backend Developer	Design, Develop and Unit Test Services/API/DB
Sarath	Cloud Architect	Design the cost effective, highly available and scalable architecture
Akaash	Cloud Operations	Provision required Services
Sarath	Tester	Define Test Cases and Perform Testing

3.2. Responsibility Assignment Matrix

RACI Matrix	**Team Members**			
Activity	**Name (BA) AKAASH**	**Name (Developer) SARATH**	**Name (Project Manager) NAMIT**	**Key Business User**
User Requirement Documentation	A	C/I	I	R
Railway communications	R	R	I	C
UI/UX design	R	C	I	I
Database management	R	A	I	C
Business Analyst	R	A	I	I
Frontend development	R	R	I	I
Backend development	R	R	I	I
Cloud Operations	R	A	I	C
Technical lead	R	C	A	C
Project management	R	C	R	C

A	Accountable
R	Responsible
C	Consult
I	Inform

Result: Thus, the Project Plan was documented successfully.

Department of Indian Railways

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	5
Title of Experiment	Prepare Work breakdown structure, Timeline chart, Risk identification table
Name of the candidate	NAMIT LODH
Team Members	SARATH RADHAKRISHNAN, AKAASH RAM
Register Number	RA2011027010116
Date of Experiment	13/05/2022

Mark Split Up

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

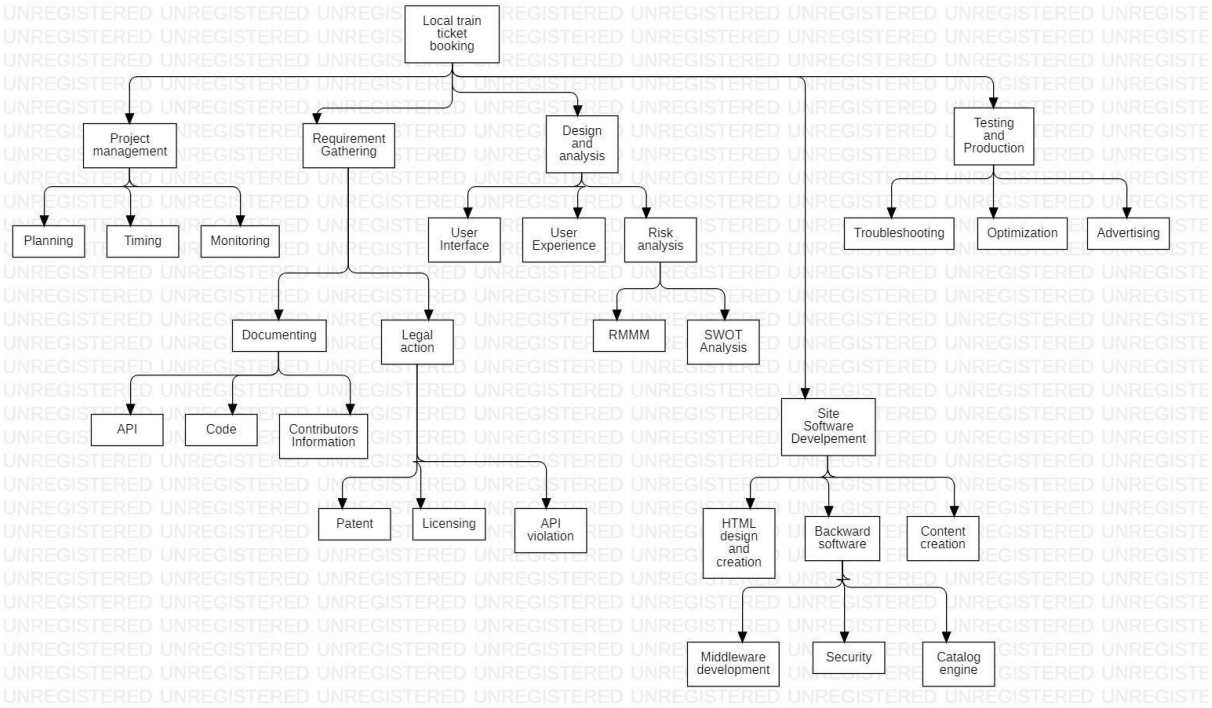
Aim

To Prepare Work breakdown structure, Timeline chart and Risk identification table

Team Members:

Sl No	Register No	Name	Role
1	RA2011027010116	NAMIT LODH	**Rep**
2	RA2011027010113	SARATH RADHAKRISHNAN	**Member**
3	RA2011027010126	AKAASH RAM	**Member**

WBS – Examples

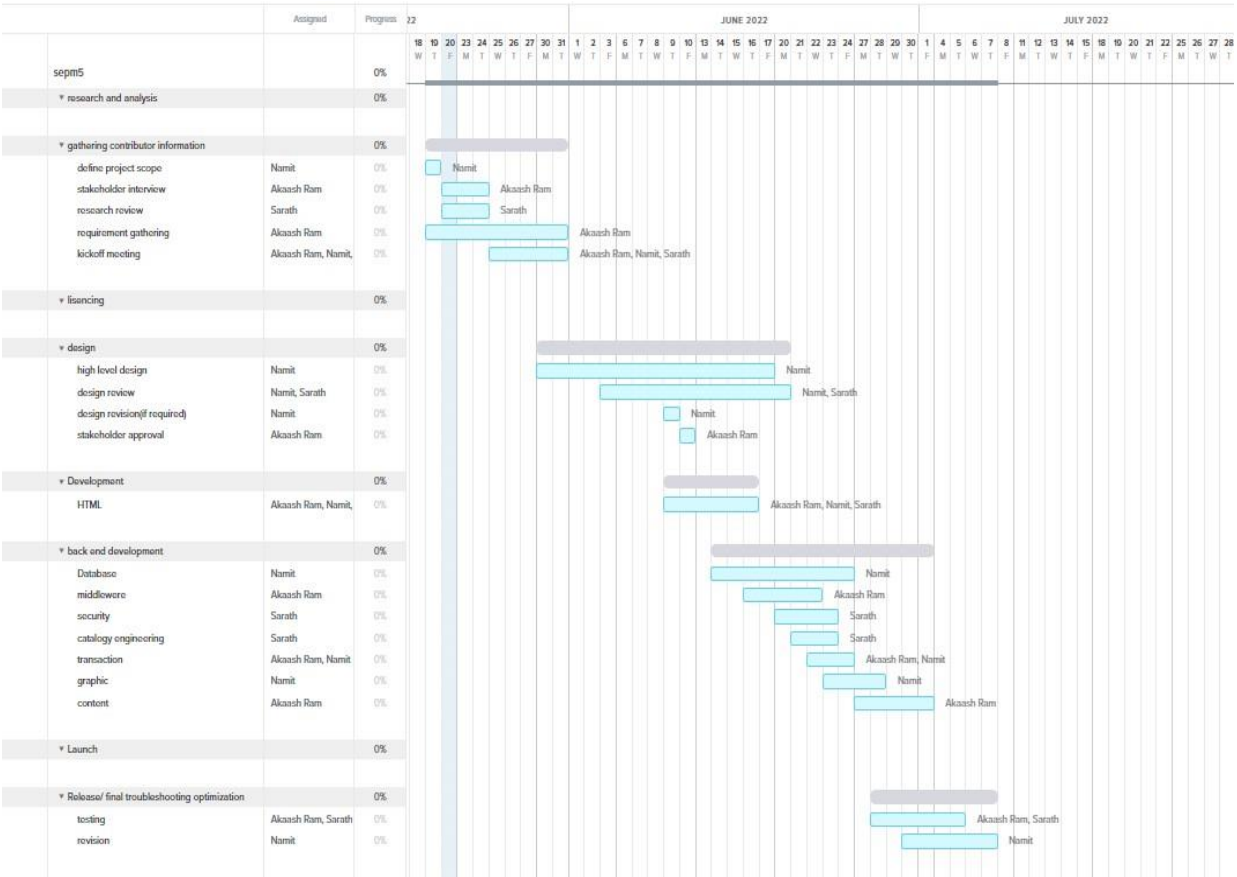


- 0.0 Local train ticket booking
- 1.0 Project Management
  - 1.1 Planning
  - 1.2 Timing
  - 1.3 Monitoring
- 2.0 Requirements Gathering
  - 2.1 Documenting
    - 2.1.1 API
    - 2.1.2 Code
    - 2.1.3 Contributors information
  - 2.2 Legal Action
    - 2.2.1 Patent

        - 2.2.2 Licensing
        - 2.2.3 API violation

- 3.0 Analysis & Design
    - 3.1 User Interface
    - 3.2 User Experience
    - 3.3 Risk Analysis
        - RMMM
        - SWOT analysis
- 4.0 Site Software Development
    - 4.1 HTML Design and Creation
    - 4.2 Backend Software
        - 4.2.2 Middleware Development
        - 4.2.3 Security
        - 4.2.4 Catalog Engine
    - 4.4 Content Creation
- 5.0 Testing and Production
    - 5.1 Troubleshooting
    - 5.2 Optimization
    - 5.3 Advertising

TIMELINE – GANTT CHART



RISK ANALYSIS – SWOT & RMMM

SWOT ANALYSIS of Local train ticket booking:

STRENGTHS- **1. user friendly** **2. relevant to users** **3. good service** **4. fast** **5. easy to search**	**WEAKNESSES-** **1. poor connection to the internet** **2. poor content or poor information about stations** **3. poor optimization of the website**
OPPORTUNITIES- **1. a new platform for business** **2. a new market for business** **3. opportunities for users to try new way of booking tickets**	**THREATS-** **1. other competitors** **2. software threats** **3. fraud activities**

RMMM-

RESPONSE	STRATEGY	EXAMPLES
Avoid	with risk avoidance, we will take actions to avoid the threat of the risk or project from the impact of the risk.	• legal notices • businesses not paying on time • execution strategy • redundancy
Transfer	with risk transference, we will give the risks or threats to the third party for example lawyer for taking up the legal actions on the website.	• insurance • warranty of the product • transactions • legal notices
Mitigate	with risk mitigation, we will try to reduce the probability of the risk by increasing the testing of website, taking businesses who are stable etc. Here we don't have an actual risk but it can become real in future.	• increasing testing • businesses who are stable • reducing complexity process
Accept	with risk acceptance, we know the risks involved about how it can impact our website, like the mobile is necessary for this system, scheduled time of train but not showing in website, smooth running of the website, but we cannot do any preemptive actions because it has to occur since we are not in control of it.	• the budgets • scheduling • quality of the product

Result:

Thus, the work breakdown structure with timeline chart and risk table were formulated successfully.

Department of Indian Railways

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	6
Title of Experiment	Design a System Architecture, Use Case and Class Diagram
Name of the candidate	NAMIT LODH
Team Members	AKAASH RAM, SARATH RADHAKRISHNAN
Register Number	RA2011027010116
Date of Experiment	21-05-2022

Mark Split Up

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

Aim

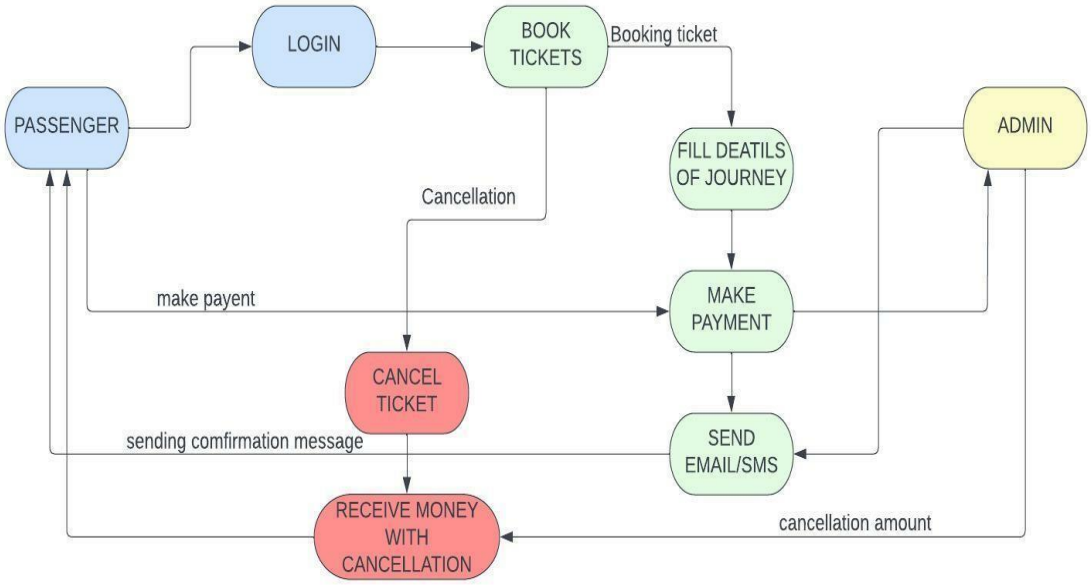
To Design a System Architecture, Use case and Class Diagram

Team Members:

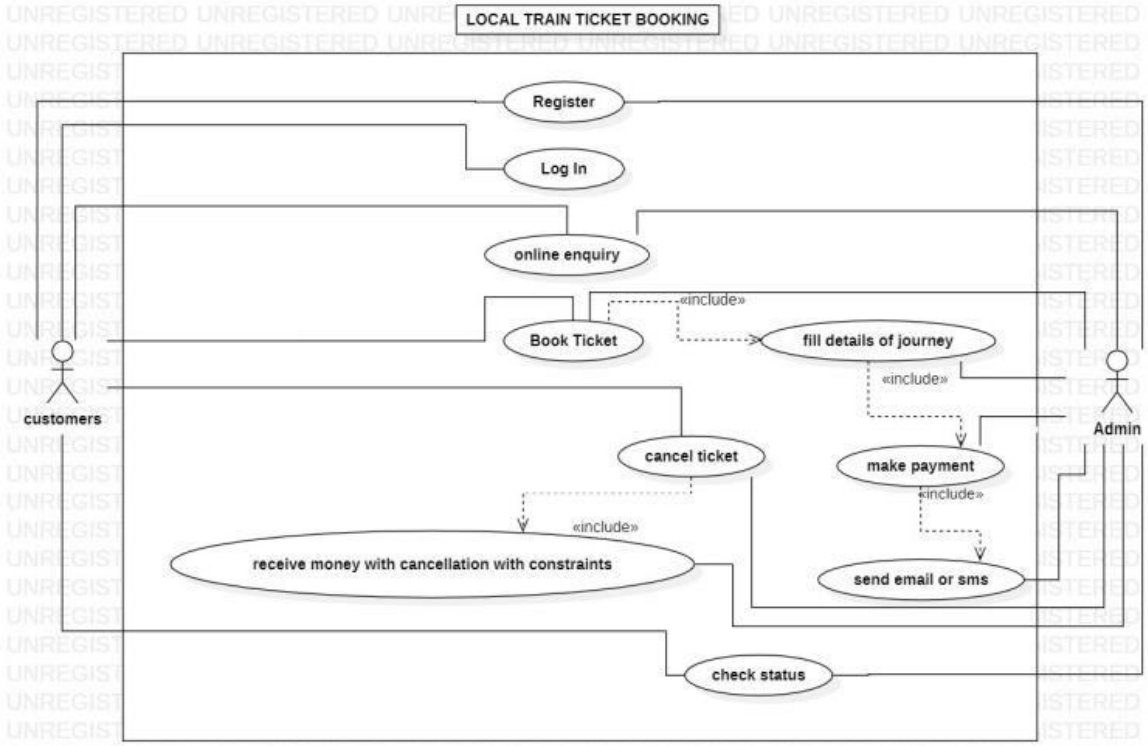
Sl No	Register No	Name	Role
1	RA2011027010116	NAMIT LODH	Rep
2	RA2011027010113	SARATH RADHAKRISHNAN	Member
3	RA2011027010126	AKAASH RAM	Member

Requirements

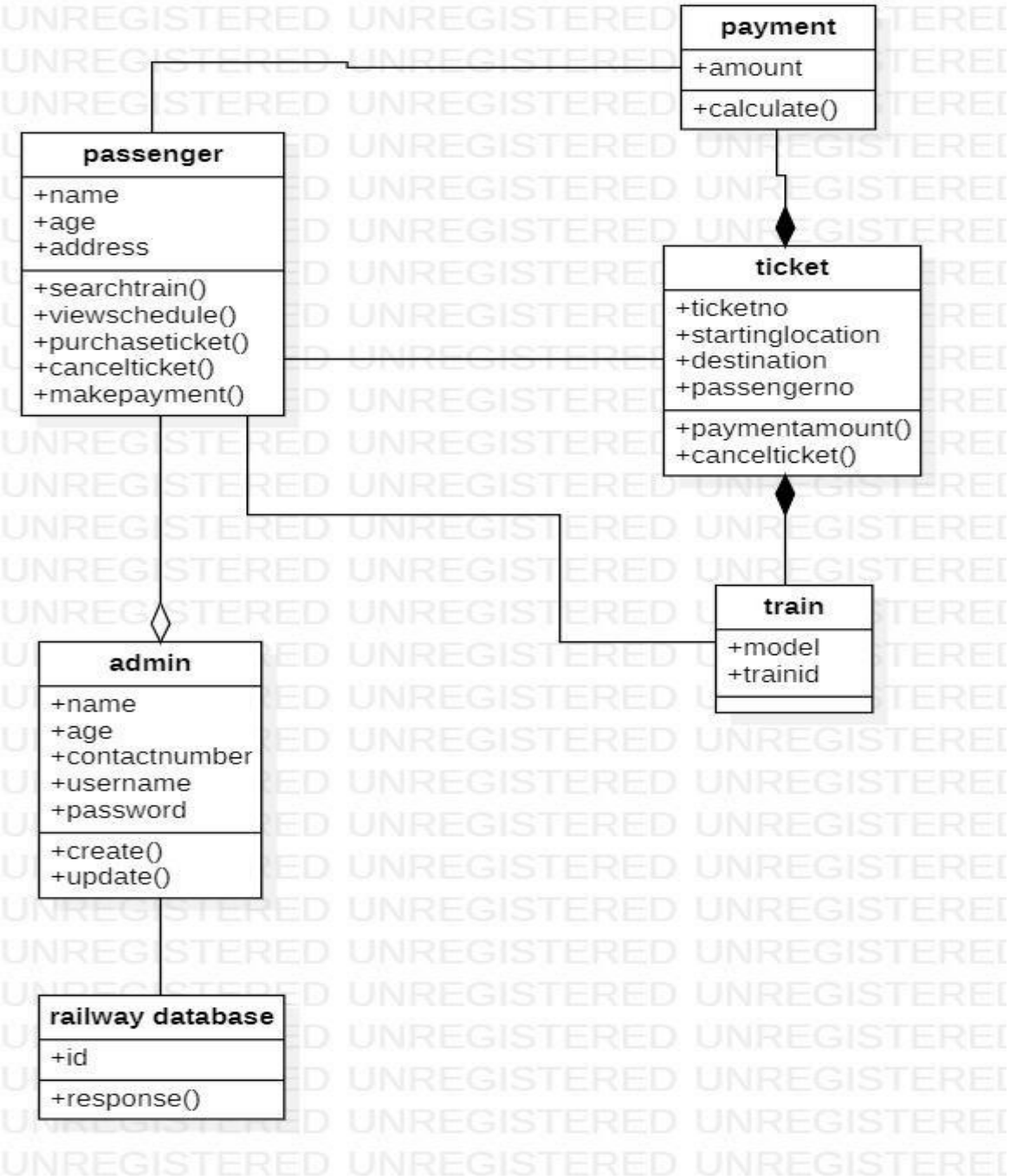
SYSTEM ARCHITECTURE :



USE CASE DIAGRAM :



CLASS DIAGRAM :



Result:

Thus, the system architecture, use case and class diagram created successfully.

Department of Indian Railways

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	7
Title of Experiment	Design a Entity relationship diagram
Name of the candidate	NAMIT LODH
Team Members	SARATH RADHAKRISHNAN, AKAASH RAM
Register Number	RA2011027010116
Date of Experiment	23-05-2022

Mark Split Up

S. No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

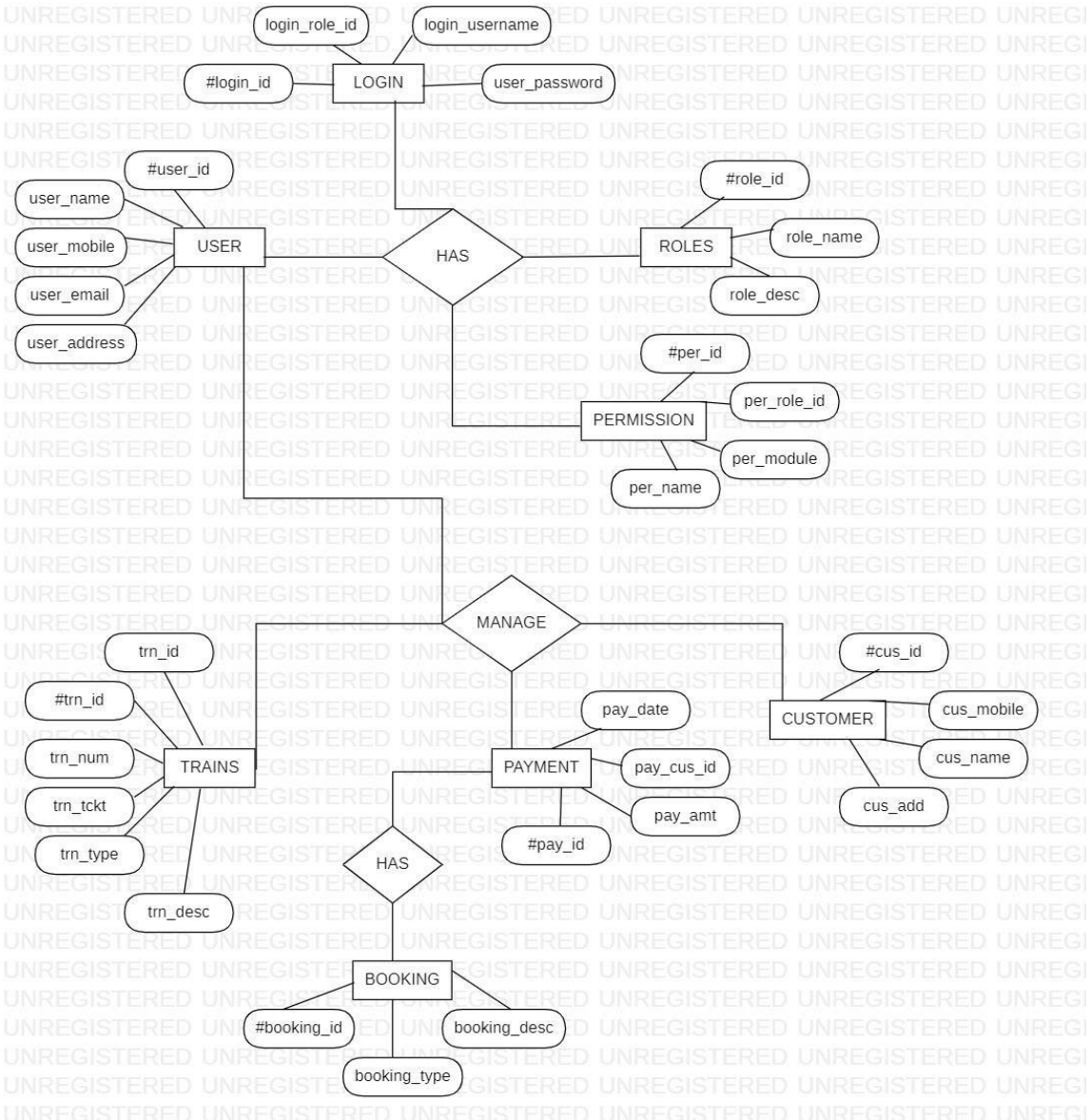
Staff Signature with date

Aim

To create the Entity Relationship Diagram **Team Members:**

S No	Register No	Name	Role
1	RA2011027010116	NAMIT LODH	Rep
2	RA2011027010113	SARATH RADHAKRISHNAN	Member
3	RA2011027010126	AKAASH RAM	Member

<ER Diagram >



***/ ER Diagram What is ER Diagram?**

- ER Diagram stands for Entity Relationship Diagram, also known as ERD is a diagram that displays the relationship of entity sets stored in a database. In other words, ER diagrams help to explain the logical structure of databases. ER diagrams are created based on three basic concepts: entities, attributes and relationships.
- ER Diagrams contain different symbols that use rectangles to represent entities, ovals to define attributes and diamond shapes to represent relationships.
- At first look, an ER diagram looks very similar to the flowchart. However, ER Diagram includes many specialized symbols, and its meanings make this model unique. The purpose of ER Diagram is to represent the entity framework infrastructure.

What is ER Model?

- ER Model stands for Entity Relationship Model is a high-level conceptual data model diagram. ER model helps to systematically analyze data requirements to produce a welldesigned database.
- ER Model represents real-world entities and the relationships between them. Creating an ER Model in DBMS is considered as a best practice before implementing your database. - ER Modeling helps you to analyze data requirements systematically to produce a welldesigned database. So, it is considered a best practice to complete ER modeling before implementing your database.

Why use ER Diagrams?

Here, are prime reasons for using the ER Diagram

- Helps you to define terms related to entity relationship modeling
- Provide a preview of how all your tables should connect, what fields are going to be on each table
- Helps to describe entities, attributes, relationships
- ER diagrams are translatable into relational tables which allows you to build databases quickly
- ER diagrams can be used by database designers as a blueprint for implementing data in specific software applications
- The database designer gains a better understanding of the information to be contained in the database with the help of ERP diagram
- ERD Diagram allows you to communicate with the logical structure of the database to users

Result:

Thus, the entity relationship diagram was created successfully.

Department of Indian Railways

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	8
Title of Experiment	Develop a Data Flow Diagram (Process-Up to Level 1)
Name of the candidate	NAMIT LODH
Team Members	SARATH RADHAKRISHNAN, AKAASH RAM
Register Number	RA2011027010116
Date of Experiment	27-05-2022

Mark Split Up

S. No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

Aim

To develop the data flow diagram up to level 1 for the Local train ticket booking system.

Team Members:

S No	Register No	Name	Role
1	**RA2011027010116**	**NAMIT LODH**	**Rep**
2	**RA2011027010113**	**SARATH RADHAKRISHNAN**	**Member**
3	**RA2011027010126**	**AKAASH RAM**	**Member**

<DFD >

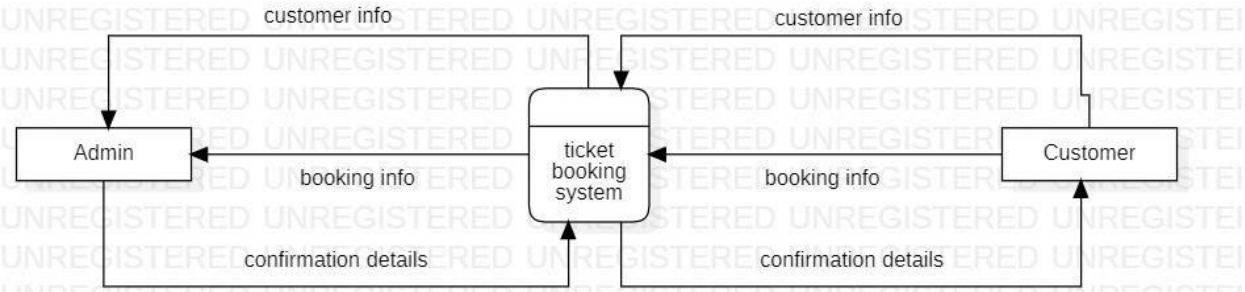
Data Flow Diagram

The DFD takes an input-process-output view of a system. That is, data objects flow into the software, are transformed by processing elements, and resultant data objects flow out of the software. Data objects are represented by labeled arrows, and transformations are represented by circles (also called bubbles). The DFD is presented in a hierarchical fashion. That is, the first data flow model (sometimes called a level 0 DFD or context diagram) represents the system as a whole. Subsequent data flow diagrams refine the context diagram, providing increasing detail with each subsequent level.

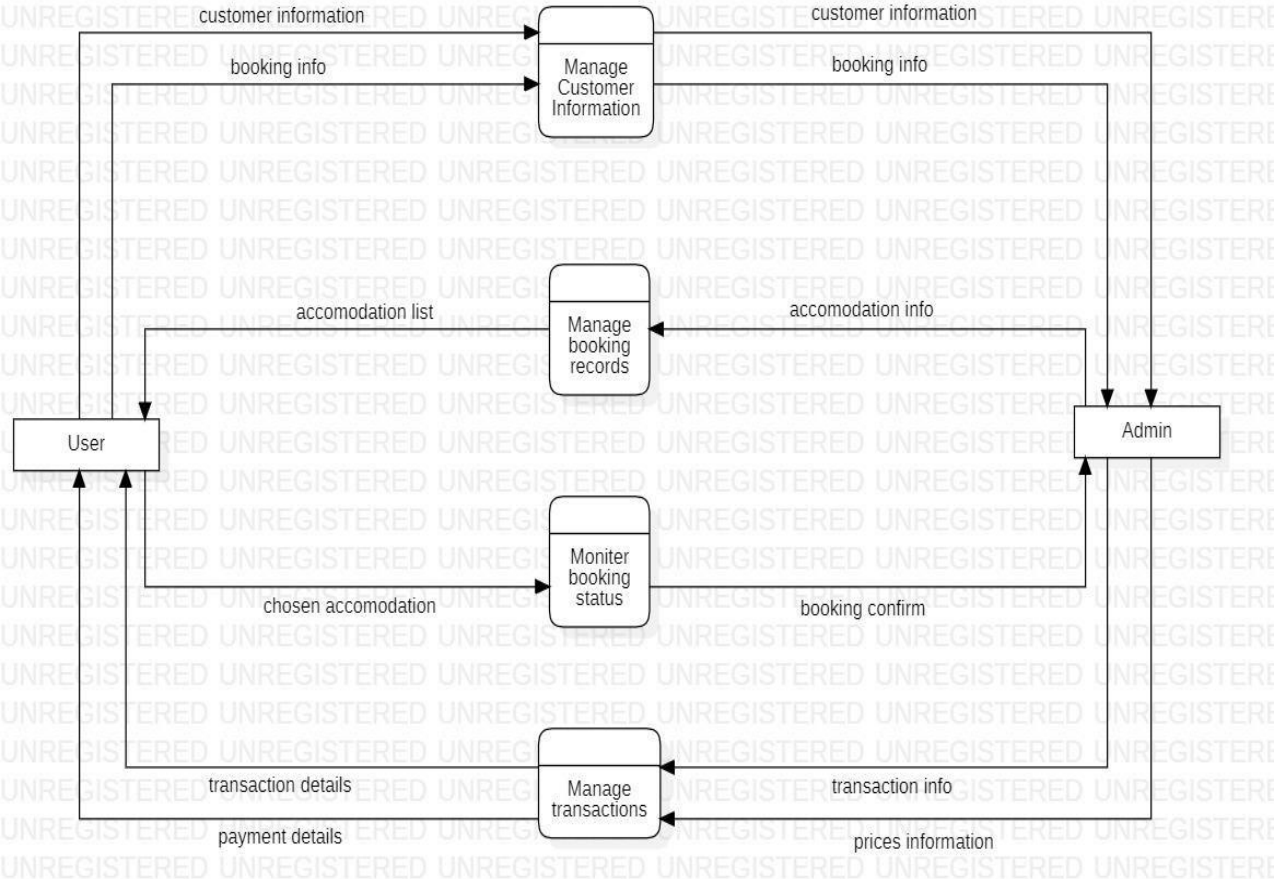
The data flow diagram enables you to develop models of the information domain and functional domain. As the DFD is refined into greater levels of detail, you perform an implicit functional decomposition of the system. At the same time, the DFD refinement results in a corresponding refinement of data as it moves through the processes that embody the application.
A few simple guidelines can aid immeasurably during the derivation of a data flow diagram:
(1) Level 0 data flow diagram should depict the software/system as a single bubble;
(2) Primary input and output should be carefully noted;
(3) Refinement should begin by isolating candidate processes, data objects, and data stores to be represented at the next level;
(4) All arrows and bubbles should be labeled with meaningful names;
(5) Information flow continuity must be maintained from level to level and
(6) One bubble at a time should be refined. There is a natural tendency to overcomplicate the data flow diagram. This occurs when you attempt to show too much detail too early or represent procedural aspects of the software in lieu of information flow.

***/ For Example**

DFD Level 0 for ticket booking:



DFD Level 1 for ticket booking:



Result:

Thus, the data flow diagrams have been created for the Local train ticket booking system.

Department of Indian Railways

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	9
Title of Experiment	Design a Sequence and Collaboration Diagram
Name of the candidate	NAMIT LODH
Team Members	SARATH RADHAKRISHNAN, AKAASH RAM
Register Number	RA2011027010116
Date of Experiment	29-5-2022

Mark Split Up

S. No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

Aim

To create the sequence and collaboration diagram for the Local train ticket booking system.

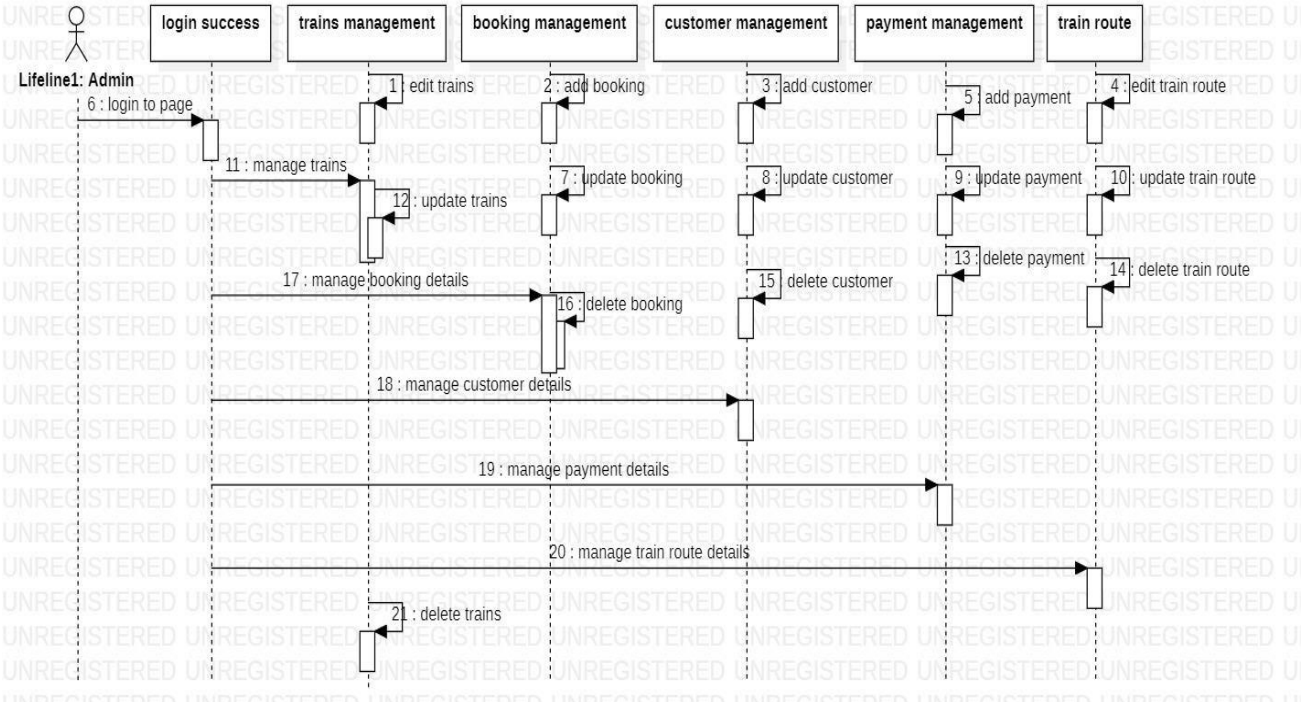
Team Members:

S No	Register No	Name	Role
1	RA2011027010116	NAMIT LODH	Rep/Member
2	RA2011027010113	SARATH RADHAKRISHNAN	Member
3	RA2011027010126	AKAASH RAM	Member

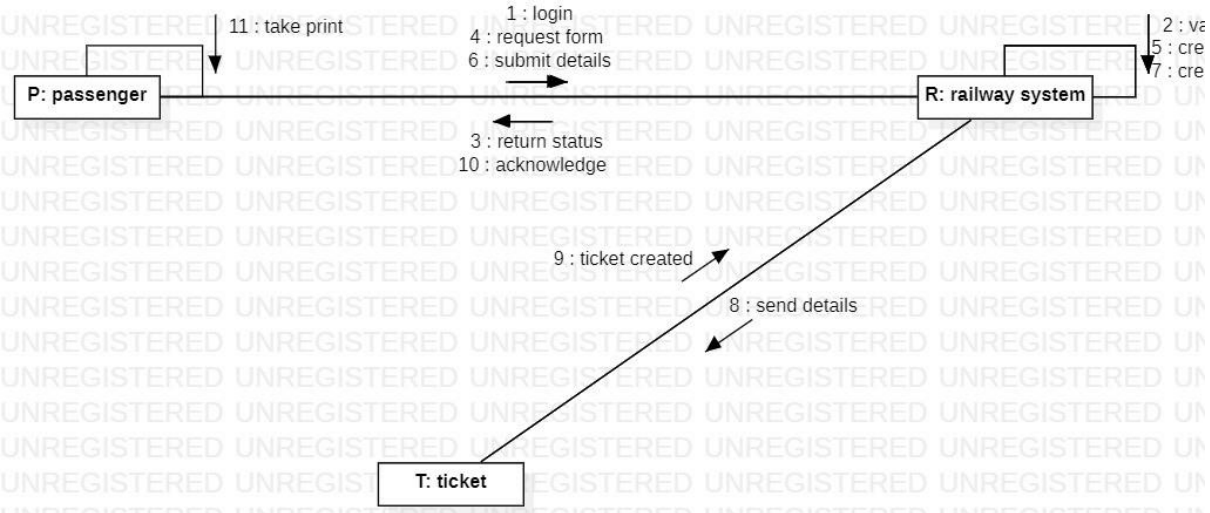
<Sequence and Collaboration Diagram>

<u>*/ For Example</u>

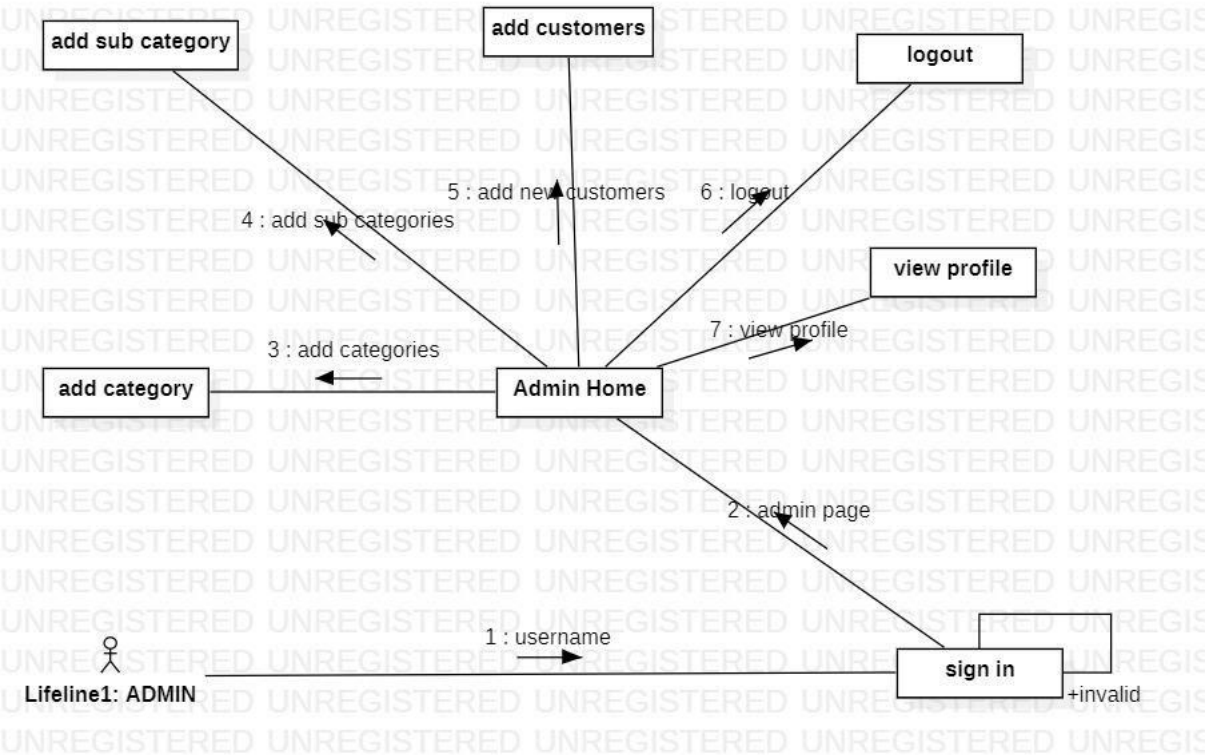
Sequence Diagram:



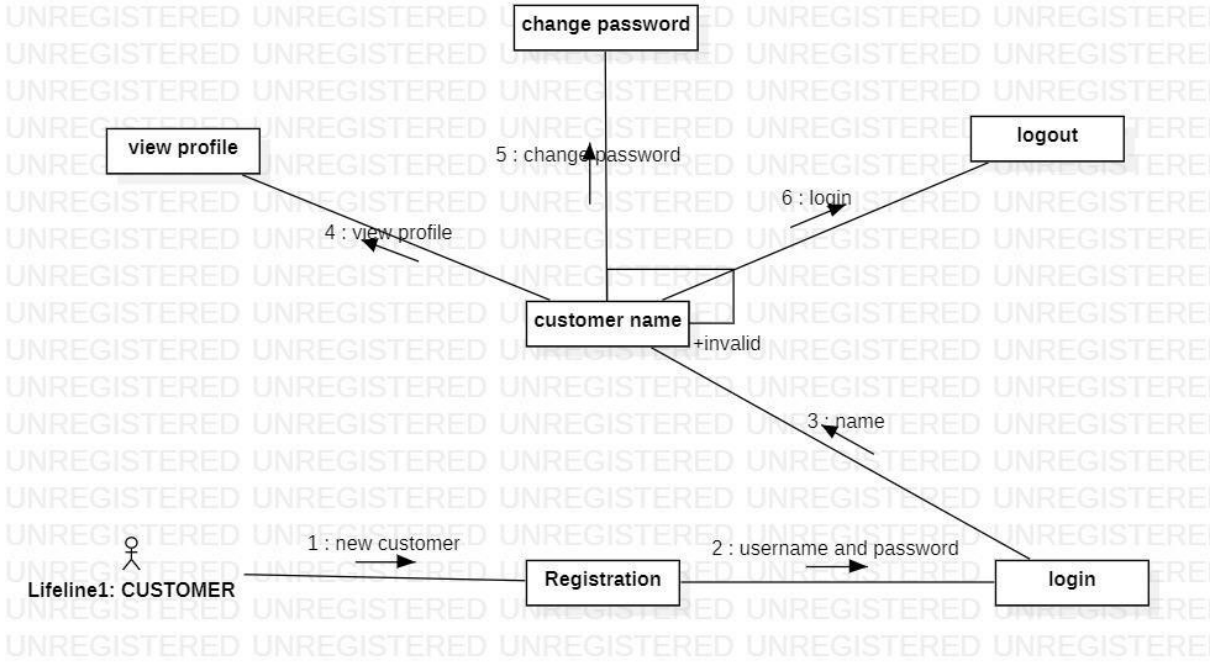
Collaboration Diagram:



Collaboration Diagram for admin:



Collaboration Diagram for Customers:



Result:

Thus, the sequence and collaboration diagrams were created for the Local train ticket booking system.

Department of Indian Railways

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	10
Title of Experiment	Develop a Testing Framework/User Interface
Name of the candidate	NAMIT LODH
Team Members	SARATH RADHAKRISHNAN, AKAASH RAM
Register Number	RA2011027010116
Date of Experiment	02-06-2022

Mark Split Up

S. No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

Aim

To develop the testing framework and/or user interface framework for the Local train ticket booking system.

Team Members:

S No	Register No	Name	Role
1	**RA2011027010116**	**NAMIT LODH**	**Rep/Member**
2	**RA2011027010113**	**SARATH RADHAKRISHNAN**	**Member**
3	**RA2011027010126**	**AKAASH RAM**	**Member**

Executive Summary

This project is aimed at developing a website for booking local train tickets. This system can be used by end users (Customer and Owner) and administrator to perform extensible tasks in an easy and secure manner. The main objective of the local train ticket booking system is to give an experience to people to get the local train ticket online. The project database can modified for any city as needed. The system also consists of an option to select weather ticket is a single journey or a return ticket. The project is totally built at the administrator is guaranteed the access. The purpose of the project is to reduce the time of people without standing in queue for long time to get a ticket.

Test Plan

The testing process will be done in 3 Major steps. First it begins with the Manual testing, then Agile testing and finally we finish with the System testing. This section of the test plan lists all the items of the local train Reservation System project that will be tested:

- Login
- Search and book trains
- Register

Scope of Testing

Functional: All Modules under Functional requirements has been completed successfully and have reached the Testing face. Testing needs to be done manually most of the features are basic and non-complex and it can be finished quickly under Manual Testing.

Non-Functional: All Modules under Non-Functional requirements have been completed successfully and have reached the Testing face. Testing needs to be done manually as most features are basic and non-complex and it can be finished quickly under Manual Testing.

Types of Testing, Methodology, Tools

Category	Methodology	Tools Required
Functional Requirements	Manual	Creating a test case for each module then verifying it.
Book tickets according to customers plan	Manual	Match with test cases using word template.
Non functional requirements	Manual	Match with test cases using word template.
Scalability	Manual	Match with test cases using word template
Reliability	Manual	Match with test cases using word template
Usabilty	Manual	Match with test cases using word template
Mangeability	Manual	Match with test cases using word template
Agile testing	Manual	Verify the steps to produce possible solutions
System testing	Manual	To assist developers and testers in performing manual or automated tests.

Result:

Thus, the testing framework/user interface framework has been created for the Local Train ticket booking system.

Department of Indian Railways

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	11
Title of Experiment	Test Cases
Name of the candidate	NAMIT LODH
Team Members	SARATH RADHAKRISHNAN, AKAASH RAM
Register Number	RA2011027010116
Date of Experiment	02-06-2022

Mark Split Up

S. No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

Aim

To develop the test cases manual for the Local Train ticket Booking system **Team Members:**

S No	Register No	Name	Role
1	RA2011027010116	NAMIT LODH	Rep
2	RA2011027010113	SARATH RADHAKRISHNAN	Member
3	RA2011027010126	AKAASH RAM	Member

Test Case

Functional Test Cases

Test ID (#)	Test Scenario	Test Case	Execution Steps	Expected Outcome	Actual Outcome	Status	Remarks
T1	Verify User Registration from India	Accept Valid India Mobile Number on the Page#1	1. User clicks on User Registration link 2. Enter the mobile Number on the text box 3. Click Register button	User should be taken to the next page for entering more user details	User should be taken to the next page of the application	Pass	success
T2	Verify Customers can book tickets	To verify the user can book tickets or not.	1. User should enter amount of tickets needed. 2. User should select the starting station 3. User should select destination station	User should be taken to the payment page of the application	User should do the payment in next page	Pass	Success
T3	Verify the payment done by customers	To verify if user can make payment or not.	1. After selecting destination station, user have to make payment according to travel 2. Make payment to the railways and get confirmed ticket from railways	User will get the ticket if payment is successful	User will get the ticket	Pass	success

Non-Functional Test Cases

Test ID (#)	Test Scenario	Test Case	Execution Steps	Expected Outcome	Actual Outcome	Status	Remarks
T1	Verify the system to handle the number of users	To handle number of concurrent users on the application	Editing HTML users in the accordingly manner.	It is the user friendly to handle the application.	It is the user friendly to handle the application.	Pass	Success
T2	Scalability testing	Making sure the website can response to multiple user at a time	enter the website then use it as their own choice	multiple users using the websites	multiple users using the website	Pass	Success
T3	Usability testing	making sure the interface is simple for user to understand	using phrases to book tickets on the website which can be understood by everyone	the website is usable by everyone	the website is usable by everyone	Pass	Success

Category	Progress Against Plan	Status
Functional Testing	Green	In-Progress
Non-Functional Testing	Green	In-Progress

Functional	Test Case Coverage (%)	Status
Front end	50%	In-Progress
User reservation	40%	In-Progress
Data Base	60%	In-Progress
Back end	40%	In-Progress

Functional	Test Case Coverage (%)	Status
Response Time	50%	In-Progress
Updation time	40%	In-Progress

Result:

Thus, the test case manual has been created for the Local Train Ticket Booking system.

Department of Indian Railways

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	12
Title of Experiment	Provide the details of Architecture Design/Framework/Implementation
Name of the candidate	NAMIT LODH
Team Members	SARATH RADHAKRISHNAN, AKAASH RAM
Register Numbers	RA2011027010116
Date of Experiment	16-06-2022

Mark Split Up

S. No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

Aim

To provide the details of architectural design/framework/implementation

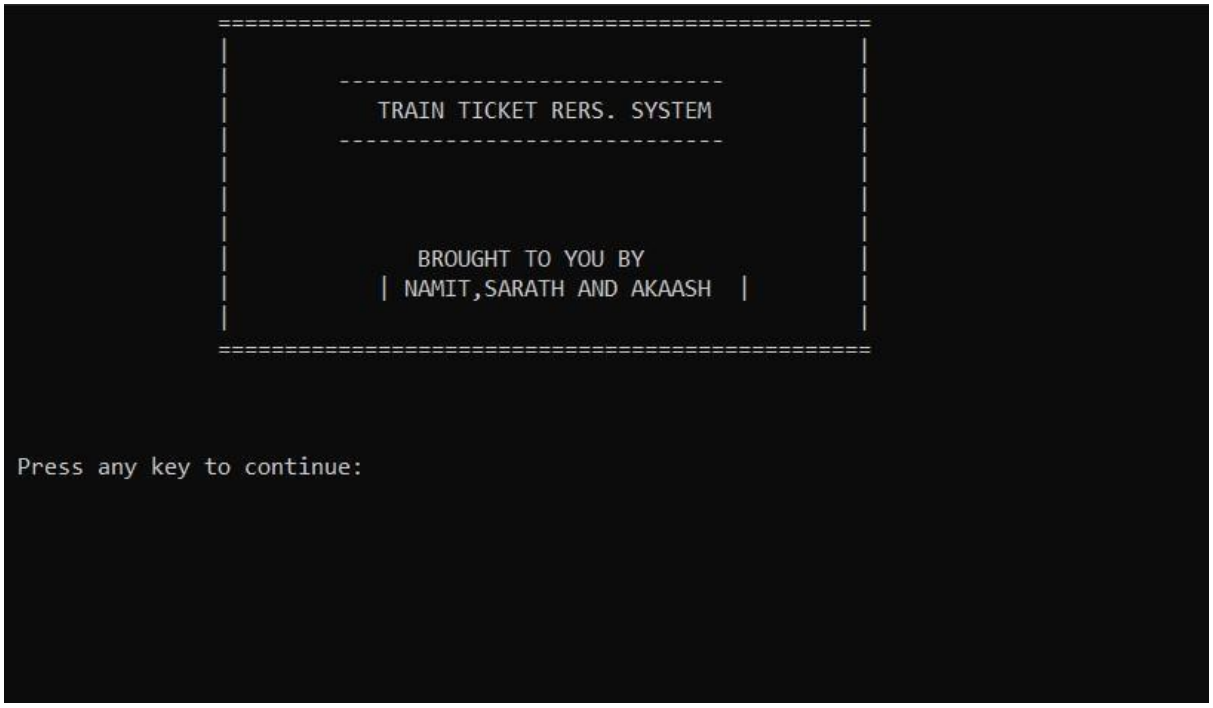
Team Members:

S No	Register No	Name	Role
1	RA2011027010116	NAMIT LODH	Rep/Member
2	RA2011027010113	SARATH RADHAKRISHNAN	Member
3	RA2011027010126	AKAASH RAM	Member

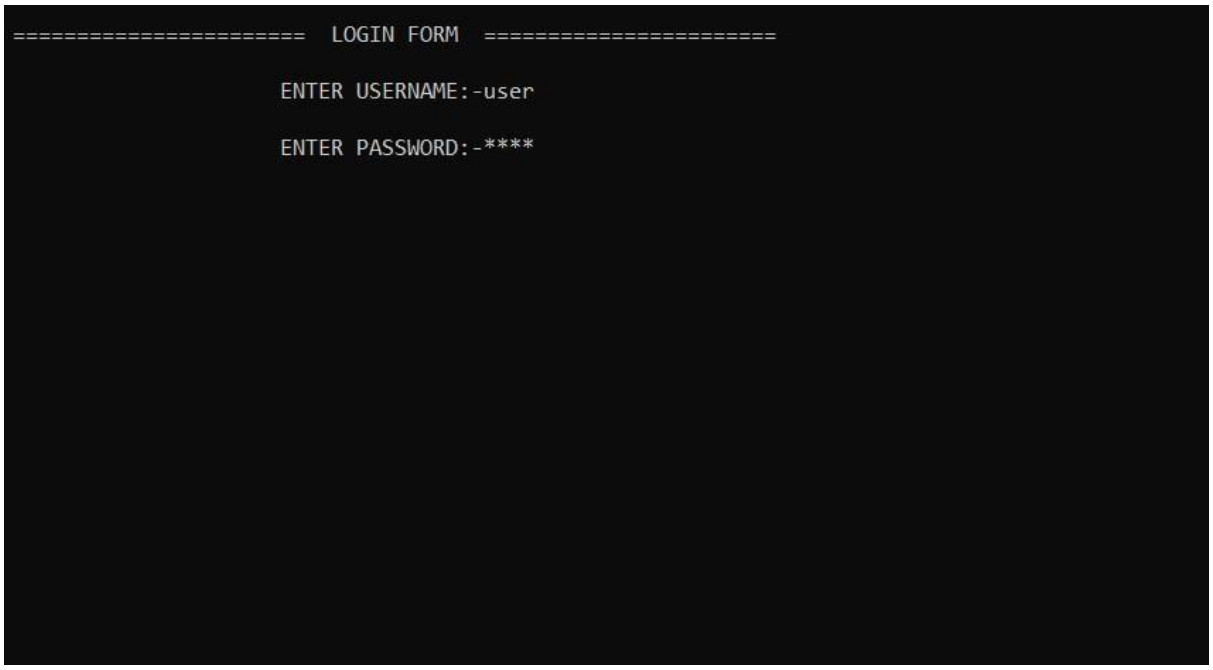
< Provide the details of architectural design/framework/implementation with screenshots - Minimum three modules to be completed (excluding login page) use of software on their choice to implement>

Full documentation with the coding

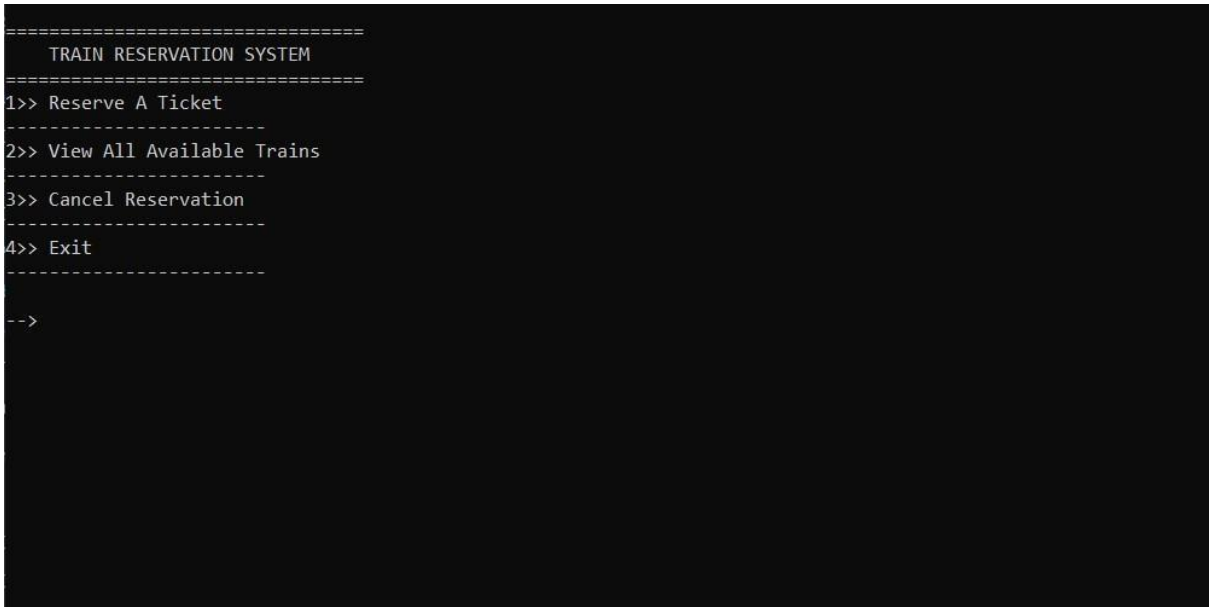
INITIAL INTERFACE:



Then we have to put username and password.



We will get four option as below image and we have to select one as per our choice.



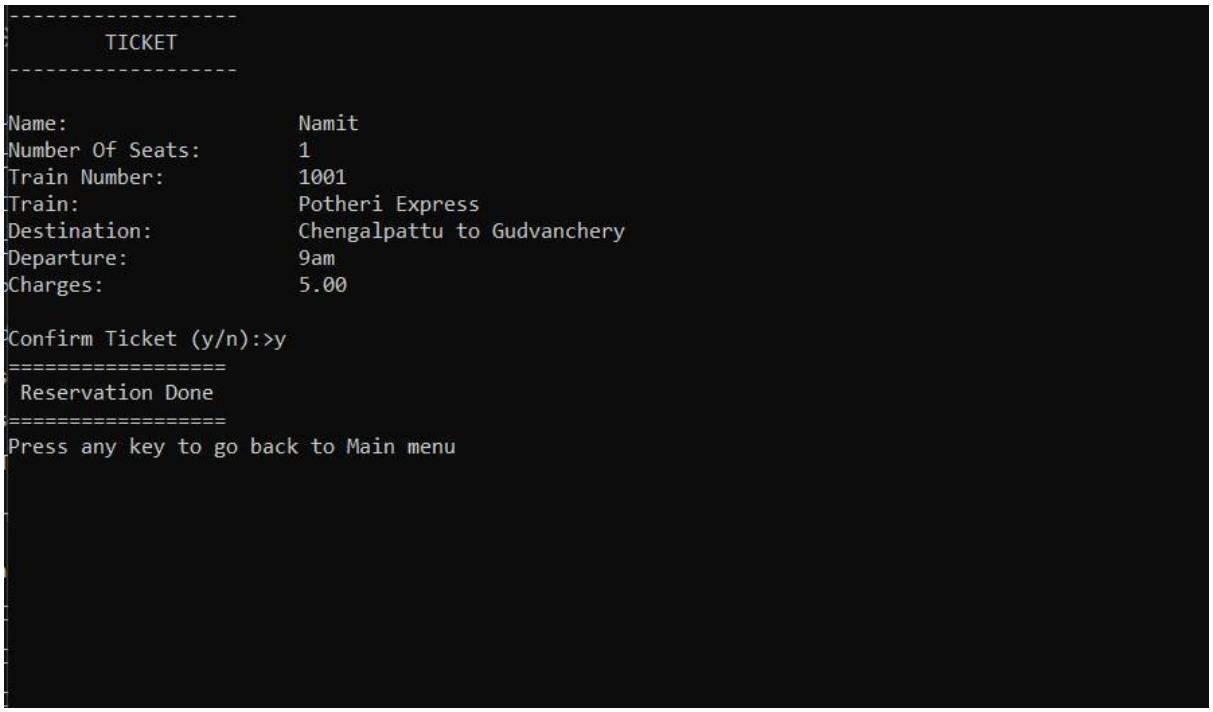
For reserving a ticket we need to fill the details.

```
Enter Your Name:> Namit

Enter Number of seats:> 1


>>Press Enter To View Available Trains<<
```

```
-------------------------------------------------------------------------------
Tr.No   Name                  Destinations           Charges         Time
-------------------------------------------------------------------------------
1001    Potheri Express Chengalpattu to Gudvanchery     Rs.5            9am
1002    Tambaram Express        Chengalpattu to Tambaram        Rs.10           9am
1003    Chennai Beach Express   Tambaram to Chennai Beach       Rs.10           10am

Enter train number:> 1001
```

```
------------------
        TICKET
------------------

Name:                   Namit
Number Of Seats:        1
Train Number:           1001
Train:                  Potheri Express
Destination:            Chengalpattu to Gudvanchery
Departure:              9am
Charges:                5.00

Confirm Ticket (y/n):>y
```

Finally we will get a ticket.



Result:

Thus, the details of architectural design/framework/implementation along with the screenshots were provided.

CONCLUSION

The main aim of developing Local Train Ticket Booking system is to fulfill all the requirements needed by the people. User friendliness is a must that is the user must get the benefits without following the complicated and time consuming procedures. During this period we learned to handle a project efficiently and correctly and also we learned to tackle various adverse situations while managing and developing software. We learned to work with C# and Visual Studio during this time. The project greatly helped in understanding the various phases of software development and software engineering process. Hence, we finally created a interface for our users to book tickets online and get new experience of getting a ticket.

REFERENCES

https://nevonprojects.com/android-local-train-ticketing-project/

https://www.youtube.com/watch?v=LxCfVoUevaI&t=7s

https://projectsgeek.com/2016/05/local-train-ticketing-android-project.html

APPENDIX(CODE)

```
/*********************************************PREPROCESSORS************
*********************************************/
//Train Reservation System - BROUGHT TO YOU BY : code-projects.org
//Working on basic structure
//including all libraries for now
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
#include<string.h>

/*****************************************GLOBAL
VARIABLES*************************************************************/
//ALl the globle variables and the composite data types will be declared here typedef
struct{
        char name[50];
int train_num;          int
num_of_seats;
}pd;



/*****************************************FUNCTION
PROTOTYPE*************************************************************/
//function prototypes to be used
void reservation(void);      //main reservation function
void viewdetails(void);                                          //view details of
all the trains
void cancel(void);
void printticket(char name[],int,int,float);     //print ticket
void specifictrain(int);                                 //print data related to specific
train
```

```
float charge(int,int);                                  //charge automatically w.r.t
number of seats and train void login();


/*****************************************FUNCTION
DECLARATION*****************************************************************/

/*********************************************MAIN()*************************
**************************/

int main()

{
                system("cls");
        printf("\t\t================================================\n");
 printf("\t\t|                                                      |\n");
printf("\t\t|                    ----------------------------      |\n");
printf("\t\t|            TRAIN TICKET RERS. SYSTEM                 |\n");  printf("\t\t|
----------------------------                                        |\n");    printf("\t\t|
|\n");  printf("\t\t|                                                      |\n");
printf("\t\t|                                                      |\n");
printf("\t\t|                      BROUGHT TO YOU BY               |\n");
printf("\t\t|                  | NAMIT,SARATH AND AKAASH  |        |\n");
printf("\t\t|                                                  |\n");
        printf("\t\t================================================\n\n\n"
);


        printf(" \n Press any key to continue:");

        getch();
   system("cls");
        login();
```

```
	int menu_choice,choice_return;
start:
	system("cls");
printf("\n================================\n");
printf("    TRAIN RESERVATION SYSTEM");
printf("\n================================");
printf("\n1>> Reserve A Ticket");     printf("\n-----------------------
");       printf("\n2>> View All Available Trains");   printf("\n-------
----------------");         printf("\n3>> Cancel Reservation");
printf("\n-----------------------");         printf("\n4>> Exit");
	printf("\n-----------------------");
printf("\n\n-->");         scanf("%d",&menu_choice);
switch(menu_choice)
	{
		case 1:
			reservation();  //Fucntion still not added
	break;		case 2:
			viewdetails();
			printf("\n\nPress any key to go to Main Menu..");
			getch();
		break;
case 3:
			cancel();
			//function not added. code has been removed due to some errors
			break;
		case 4:
		return(0);
		default:
			printf("\nInvalid choice");
	}
	goto start;
return(0);
}
```

```
/*********************************************VIEWDETAILS()*********************************/

//The function is yet not completed, need more details to be added! //timings
of the trains are still missing

void viewdetails(void)
{
        system("cls");
        printf("-------------------------------------------------------------------------");
printf("\nTr.No\tName\t\t\tDestinations\t\tCharges\t\tTime\n");       printf("----------
-------------------------------------------------------");     printf("\n1001\tPotheri
Express\tChengalpattu to Gudvanchery\tRs.5\t\t9am");        printf("\n1002\tTambaram
Express\tChengalpattu to Tambaram\tRs.10\t\t9am");     printf("\n1003\tChennai Beach
Express\tTambaram to Chennai Beach\tRs.10\t\t10am"); }

/*********************************************RESERVATION()*********************************/

void reservation(void)
{
        char confirm;
        int i=0; float
        charges; pd
        passdetails;
        FILE *fp;
        fp=fopen("sea
        ts_reserved.tx
        t","a");
        system("cls");

        printf("\nEnter Your Name:> ");
fflush(stdin);   gets(passdetails.name);
```

```
        //error here have to take input of the name
printf("\nEnter Number of seats:> ");
scanf("%d",&passdetails.num_of_seats);      printf("\n\n>>Press
Enter To View Available Trains<< ");
        getch();          system("cls");
viewdetails();  printf("\n\nEnter train
number:> ");    start1:
        scanf("%d",&passdetails.train_num);
if(passdetails.train_num>=1001 && passdetails.train_num<=1010)
        {
                charges=charge(passdetails.train_num,passdetails.num_of_seats);
printticket(passdetails.name,passdetails.num_of_seats,passdetails.train_num,charges);

        }
        else
        {
                printf("\nInvalid train Number! Enter again--> ");
goto start1;
        }

        printf("\n\nConfirm Ticket (y/n):>");
start:
        scanf(" %c",&confirm);
        if(confirm == 'y')
        {
        fprintf(fp,"%s\t\t%d\t\t%d\t\t%.2f\n",&passdetails.name,passdetails.num_of_seats,pas
sdetails.train_num,charges);
                printf("==================");
printf("\n Reservation Done\n");
printf("==================");
                printf("\nPress any key to go back to Main menu");
        }
        else
```

```
	{
		if(confirm=='n'){
			printf("\nReservation Not Done!\nPress any key to go back to  Main
menu!");
		}
		else
		{
			printf("\nInvalid choice entered! Enter again-----> ");
			goto start;
		}
	}
	fclose(fp);
getch();
}

/*********************************************CHARGE()*********************
*****************************/

float charge(int train_num,int num_of_seats)
{
		if (train_num==1001)
	{
		return(5.0*num_of_seats);
	}    else
	if(train_num==1002) {
		return(10.0*num_of_seats);
	}
      else if(train_num==1003);
	{
		return(10.0*num_of_seats);
	}
}
```

```
/*********************************************PRINTTICKET()*************
**********************************/

void printticket(char name[],int num_of_seats,int train_num,float charges)
{
        system("cls");
        printf("------------------\n");
printf("\tTICKET\n");
        printf("------------------\n\n");
printf("Name:\t\t\t%s",name);          printf("\nNumber
Of Seats:\t%d",num_of_seats);          printf("\nTrain
Number:\t\t%d",train_num);   specifictrain(train_num);
printf("\nCharges:\t\t%.2f",charges);
}

/*********************************************SPECIFICTRAIN()************
**********************************/

void specifictrain(int train_num) {

        if (train_num==1001)
        {
                printf("\nTrain:\t\t\tPotheri Express");
                printf("\nDestination:\t\tChengalpattu to Gudvanchery");
                printf("\nDeparture:\t\t9am ");
        }
        else if(train_num==1002)
        {
                printf("\nTrain:\t\t\tTambaram Express");
printf("\nDestination:\t\tChengalpattu to Tambaram");
printf("\nDeparture:\t\t9am ");
        }
```

```
        else if(train_num==1003)
        {
                printf("\nTrain:\t\t\tChennai Beach Express");
printf("\nDestination:\t\tTambaram to Chennai Beach");
printf("\nDeparture:\t\t10am ");
        }
}

void login()
{
        int a=0,i=0;
   char uname[10],c=' ';
char pword[10],code[10];
char user[10]="user";
char pass[10]="pass";     do
{
   printf("\n  ========================  LOGIN FORM
========================\n  ");
   printf(" \n                    ENTER USERNAME:-");
        scanf("%s", &uname);
        printf(" \n                    ENTER PASSWORD:-"); while(i<10)
        {
           pword[i]=getch();
        c=pword[i];
        if(c==13) break;
           else printf("*");
i++;
        }
        pword[i]='\0';
//char code=pword;
        i=0;
        //scanf("%s",&pword);                    if(strcmp(uname,"user")==0
&& strcmp(pword,"pass")==0)
```

```
	{
	printf("  \n\n\n       WELCOME TO OUR SYSTEM !! YOUR LOGIN IS
SUCCESSFUL");
	printf("\n\n\n\t\t\t\tPress any key to continue...");
getch();//holds the screen
	break;
	}
	else
	{
		printf("\n       SORRY !!!!  LOGIN IS UNSUCESSFUL");
		a++;
		getch();//holds the screen
system("cls");
	}
}
	while(a<=2);
if (a>2)
	{
		printf("\nSorry you have entered the wrong username and password for four
times!!!");
		getch();

		}
		system("cls");
}

void cancel(void)   /* Sorry this function does not work. Coding is not completed. Codes have
been removed due to some errors  */
{
	/*FILE *f,*t;   int i=0;          int trainnum;
t=fopen("seats_reserved.txt","w");     if
((f=fopen("seats_reserved.txt","r"))==NULL)
	{
```

```
                printf("NO RECORD ADDED.");
                main();
        * * * * *
                *
                *
                *
                *
                *
                *
                *  /  missing codes  /
        }
        else*/
        system("cls");
int trainnum;
        printf("-----------------------\n");
printf("Enter the train number: \n");
printf("-----------------------\n");
fflush(stdin);          scanf("%i",&trainnum);
printf("\n\nCancelled");
                getch();
}
```