LAB REPORT

Submitted by

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Under the Guidance of

Mr . Srinivas L N B

In partial satisfaction of the requirements for the degree of

BACHELOR OF TECHNOLOGY
in
COMPUTER SCIENCE ENGINEERING

with specialization in INFORMATION TECHNOLOGY

SCHOOL OF COMPUTING

COLLEGE OF ENGINEERING AND TECHNOLOGY

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

KATTANKULATHUR - 603203

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SRM INSTITUTION OF SCIENCE AND TECHNOLOGY
KATTANKULATHUR-603203

BONAFIDE CERTIFICATE

Certified that this lab report title **"CARGO MANAGEMENT SYSTEM "** is the bonafide work done by Aditya Balaji Yalavarthy(RA2011031010120) who carried out the lab exercises under my supervision. Certified further,that to do best of my knowledge the work reported herein does not form part of any other work.

SIGNATURE

Dr . Srinivas L N B

SEPM – Course Faculty

Associate Professor

Department of Networking
and Communications

ABSTRACT

The cargo management system is an application that will help in maintaining the cargo trading either through ship or locally. This application can be used by the cargo company to know about the cargo quantity that is managed within its warehouse, price of the cargo, availability of the cargo and many other features. This application can drastically reduce the pen paper work as it can be automated. It can also help in storing the information in an easier way. The data can be stored easily through this application. The user interface will be simple and user friendly. This will be one of the interesting applications that one can implement in real time world. Tracking of the cargo is available which is helpful for customers.

Agile methodology is the application for the values established primarily for the technology domain as Agile software development. Today this methodology is becoming more prevalent in various management techniques in other industries too. Trying the appearance and interface of the agile software development domain in 2001, after that agile system began to scatter into other areas of activities because agile methodology values are based on the combination of experience throughout the delivery process. It can be used for the models which has delivery and tracking options like cargo shipping.

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LIST OF FIGURES

Department of Networking and Communications

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 Cargo Management System**
Name of the candidate	**Aditya Balaji Yalavarthy**
Team Members	**SURADA SHRIDHAR** **ADITYA BALAJI YALAVARTHY** **MANIVEER REDDY**
Register Number	**RA2011031010120**
Date of Experiment	**21-03-2022**

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 Cargo Management System.

Team Members:

S. No	Register No	Name	Role
1	RA2011031010132	SHRIDHAR SURADA	Lead/Rep
2	RA2011031010127	MANIVEER REDDY	Member
3	RA2011031010120	ADITYA BALAJI YALAVARTHY	Member

Project Title: CARGO MANAGEMENT SYSTEM

Project Description

The cargo management system is an application that will help in maintaining the cargo trading either through ship or locally. This application can be used by the cargo company to know about the cargo quantity that is managed within its warehouse, price of the cargo, availability of the cargo and many other features. This application can drastically reduce the pen paper work as it can be automated. It can also help in storing the information in an easier way. The data can be stored easily through this application. The user interface will be simple and user friendly. This will be one of the interesting applications that one can implement in real time world. Tracking of the cargo is available which is helpful for customers. **Problem Constraints**

Purpose and need:

The main purpose of this project is:

1. Damage and file retrieval (Manual system): manual system of filling, file retrieval problem, and file processing and delivery of progress details to clients, as such, files are exposed to damage and are difficult or impossible to recover.

2. Access and Information Channel: Customer need to constantly check on the progress of their goods and therefore need a reliable channel for monitoring and accessing information on real-time or online.

Goals and objectives:

This focuses on providing the exact and correct live location of the container in any means of transport.

It offers number of benefits including:

- Providing status of the cargo to user.
- Collecting goods information from several clients, and can record and maintain delivery information.

Users:

- Anyone who ever placed cargo shipment order can use.
- We have websites like cargo tracking-Air India, track and trace etc.
- Resources available: smart mobile, laptops or any other portable devices.

Requirements:

Hardware requirements:

System: intel core above i3

Hard disk: minimum 8GB Software requirements:

Operating system: windows 8/9/10

Language: PHP

Tools: latest version of visual studio

Budget:

The total budget for making this project would be around 30,000/-.

Result:

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

ONE PAGE BUSINESS CASE TEMPLATE

DATE	**21st MAR 2022**
SUBMITTED BY	**SURADA SHRIDHAR** **ADITYA BALAJI YALAVARTHY** **MANIVEER REDDY**
TITLE / ROLE	**CARGO MANAGEMENT SYSTEM**

THE PROJECT

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

- To automate all activities of cargo tracking in cargo management.
- Designing a system to eliminate the current manual system of filing, file retrieval problem, and file processing and delivery of progress details to clients.
- Records the cargo events from the source location to destination location.
- To determine the extent to which an online cargo tracking system will help both management
  and clients.

THE HISTORY

In bullet points, describe the current situation.

- Automatic identification system (AIS) was the first ever invention in 1990's to track the goods it was especially designed to track the cargo ships.
- Later many websites came like marine-traffic, shipway, wetrack etc.
- Air India cargo tracking and Marine-Traffic are the leading and most used.
- Currently the cargoes and the transport which carry them get tracked in the same application as the cargo location is same as the transport.

LIMITATIONS

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

- Cost of tracking devices
- The Time delay due to weather conditions.
- The cargo should be delivered without any damages.
- The safe shipment of the cargo from roadways to ships or airplanes.

APPROACH

List what is needed to complete the project.

- Building team.
- Defining goals.
- Plan Cost.
- Creating agenda regularly for progress and quality.

BENEFITS

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

- Collecting goods information from several clients, and can record and maintain delivery information.
- Maximized cost saving.
- Less worrying for the customers because they can track their cargo.
- Superior customer service.

Department of Networking and Communications

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	**Aditya Balaji Yalavarthy**
Team Members	**SRIDHAR** *maniveer* **ADITYA BALAJI**
Register Number	**RA2011031010120**
Date of Experiment	**13-04-2022**

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

Team Members:

Sl No	Register No	Name	Role
1	RA2011031010132	SHRIDHAR SURADA	**Rep/Member**
2	RA2011031010127	MANIVEER REDDY	**Member**
3	RA2011031010120	ADITYA BALAJI YALAVARTHY	**Member**

Project Title: Cargo Management System

Selection of Methodology

Agile Methodology

Description: Agile methodology is the application for the values established primarily for the technology domain as Agile software development. Today this methodology is becoming more prevalent in various management techniques in other industries too. Trying the appearance and interface of the agile software development domain in 2001, after that agile system began to scatter into other areas of activities because agile methodology values are based on the combination of experience throughout the delivery process. It can be used for the models which has delivery and tracking options like cargo shipping.

Agile Methodology: Agile methods were seen initially as best suitable for non-critical service and product domains, thereby barred from use in regulated fields such as cargo systems and managements, financial, nuclear systems, automotive, and avionic sectors etc. however, recently there have been some drives for the adoption of agile methods for non-technology domains.

- **Agile Management is the application of cargoes values:** agile management is the application of the values established primarily for the technology domain as agile software development.

- **Evolution of agile methodology:** Agile methodology encompasses many strategies to customer management under which requirements and solutions unfold through the collaborative exertion of self-organizing and cross functional teams with their customers.

    1. **Planning for Agile Methodology:** it is not too common for companies to fall into the trap for spending too much time in preparing or planning.

    2. **Project life cycle in Agile methodology:** Agile methods support a broad range of development or implementation life cycle. Some focus on the cargoes, while some focus on managing the flow of work and data base storing of the cargoes.

    3. **The quality focus in agile methodology:** Various tools are often used to improve and enhance service in Agile.

- **Reasons to choose Agile over Waterfall methodology:**

    1. Less errors.
    2. Flexible.
    3. Predictable results.
    4. Can make changes.
    5. Customer involvement and friendly.
    6. Predict the cost of a project.

INTEREST AND INFLUENCE MATRIX:

Stakeholder Name	Activity/ Area /Phase	Interest	Influence	Priority (High/ Medium/ Low)
Sales & Marketing	Mobile app	High	High	1
Finance	Multiple payment gateways	High	Low	2

Stakeholder	Interests	Estimated project impact	Estimated priority
Owner	Achieves target and increases bookings of cargoes.	High	1
Sponsor	Funding for the project and makes changes the project environment.	Med	3
Marketing Team	Ensuring the proper product status in the market. Increasing the productivity of the company.	High	6
Project Manager	Lead the team in every aspect, accountable for the project's success or failure.	High	2
Climatologist	Reads the weather pattern and informs the delay of delivery.	Med	5
Technical Team Members	Proper back-end and front-end design and development. Maintains the technical support all around.	High	1
Non-Tech Members	Provides high quality products (location trackers) from manufacturers at good price.	Low	4
End Users	Provides Feedback	Low	7

Result:

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

Department Of Networking and Communications

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	Aditya Balaji Yalavarthy
Team Members	Shridhar Surada Aditya Balaji Yalavarthy Maniveer
Register Number	**RA2011031010120**
Date of Experiment	20-04-2022

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	RA2011031010132	Shridhar Surada	Rep/Member
2	RA2011031010120	Aditya Balaji Yalavarthy	Member
3	RA2011031010127	Maniveer	Member

Project Title: < Cargo Management System>

System Requirements:

Hardware:

System- intel core above i3.

Hard disk- min. 8gb Software:

Operating system- windows 8/9/10/11

Language- python

Tools- latest version of visual studio

Functional Requirements:

We have a system which is capable of registering the users urging for sending material from cargo so they log in and feed their data and then selects the ship according to his need and then get the approval and pays for it and then load the material with given time slot and start the ship at a given time to the desired destination.

Hence this system is capable of doing all such operation with effective results.

- Registration of users who are searching for cargo.
- Payment methods according to customers choice.
    1. Express delivery.
    2. Normal delivery.

- Shipping of cargoes into the ship which goes to the destination.

Non-Functional Requirements:

Non-functional cargo transporting management services needs to place restrictions on the merchandise being developed, the event technique, and specify external constraints that the merchandise has to be compelled to meet. Our project qualifies all the factors of helpful and not-helpful consequently and the system is up to mark performance device.

Here we'd prefer to need the care of few lots of things before heading towards the system. the many sensible intuitive interfaces are usually created. That ultimately build an interface easy to use for a lengthy time. in distinction to ancient vogue wherever the goal is to create the difficulty or application physically enticing, the goal of interface vogue is to create the user's interaction expertise as simple and intuitive as double – what's typically mentioned as user-centred vogue. Where smart graphic/industrial vogue is daring and eye-catching, smart interface vogue is sometimes delicate and invisible.

- Required cargo containers for the safe delivery.
- Weight limitations according to the ship.
- Cargoes shouldn't exceed the dimensions.
- Security and quality shipment for all the cargoes until it reaches destination safely.
- Maintainability
- Typography in the website.
- Feedback from the customers.

Result: -Thus, the requirements were identified and accordingly described.

Department of Networking and Communications

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	**Aditya Balaji Yalavarthy**
Team Members	Surada Shridhar Maniveer Aditya Balaji
Register Number	RA2011031010120
Date of Experiment	22-04-2022

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	RA2011031010132	SURADA SHRIDHAR	Lead
2	RA2011031010127	MANIVEER REDDY	Member
3	RA2011031010120	ADITYA BALAJI	Member

1. Project Management Plan

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

Focus Area	Details
Scope Management	Scope Statement: 1. Designing good interface. 2. Designing the database 3. Managing the infrastructure for the carriers. 4. Developing backend user data like user authentication for login. 5. Giving proper suggestions to the customers feedback. Requirement Management: 1. Requirement gathering outreach of the company that we are delivering the cargoes. 2. Defining tasks, responsibilities and delivery dates. 3. Collecting user feedback and managing the issues.
Schedule Management	Define Milestones 1. Requirement gathering (1 week) 07 / 03 / 2022 – 14 / 03 / 2022 2. Development Period (2 months) 14 / 03 / 2022 – 14 / 05 / 2022 3. Testing Period (2 weeks): 14 / 05 /2022 – 31 / 05 / 2022 4. Deployment (1 week) 5. Commencement of agile Scrum Sprints

Resource Management	Managing needs – people management – skilful people are required to develop and manage the project. Finance management – minimum budget is required to produce the final project.
Risk Management	The biggest involvement in this type of process we follow is that may be by the time we complete our project the trends of market may change or any easy method may be introduced by other individuals. This might lead that all our effort might end up in vain and that will be major setback. Keeping this as the major risk we have already mentioned this to the client in bold letters and even after such extensive research.

6. Estimation

6.1. Effort and Cost Estimation

Activity Description	Sub-Task	Sub-Task Description	Effort (in hours)	Cost in INR
Design the user screen	E1R1A1T1 (Effort-Requirement-Activity-Task)	Confirm the user requirements (Acceptance criteria)	3	2100
	E1R1A1T2	Integrated frontend functionality of the screen components	4	2800
	E1R1A1T3	Integrated backend functionality of the screen components	2	1400
Identify Data Source for displaying units of Energy Consumption	E1R1A1T1	Go through Interface contract (Application Data Exchange) documents	5	35000
	E1R1A1T2	Document	1	700

Effort (hr)	Cost (INR)
1	700

6.2. Infrastructure/Resource Cost [CapEx]

< Onetime Infra requirements >

Infrastructure Requirement	Qty	Cost per qty	Cost per item
Internet connectivity	2 GB	24	12
Portable computer	1	57000	57000
Mobile	1	20000	20000
Memory	2 GB RAM	1300	1300
Processor	500 GB	38000	38000

6.3. 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

7. Project Team Formation

7.1. Identification Team members

Name	Role	Responsibilities
Online consultancy	Key Business User (Product Owner)	Provide clear business and user requirements
Shridhar	Project Manager	Manage the project
Maniveer	Business Analyst	Discuss and Document Requirements
Aditya	Technical Lead	Design the end-to-end architecture
Shridhar	UX Designer	Design the user experience
Aditya	Frontend Developer	Develop user interface

Aditya	Backend Developer	Design, Develop and Unit Test Services/API/DB
Maniveer	Cloud Architect	Design the cost effective, highly available and scalable architecture
Shridhar	Cloud Operations	Provision required Services
Aditya, Maniveer	Tester	Define Test Cases and Perform Testing

7.2. Responsibility Assignment Matrix

RACI Matrix	**Team Members**			
Activity	**Name (BA)**	**Name (Developer)**	**Name (Project Manager)**	**Key Business User**
User Requirement Documentation	A	C/I	I	R
Front End	Aditya	Aditya	Shridhar	Maniveer
Back End	Aditya	Aditya	Shridhar	Maniveer
Testing	Maniveer, Shridhar	Maniveer	Shridhar	Maniveer

A	Accountable
R	Responsible
C	Consult
I	Inform

Result:

Thus, the Project Plan was documented successfully.

Reference

1. https://www.pmi.org/
2. https://www.projectmanagement.com/
3. https://www.tpsgc-pwgsc.gc.ca/biens-property/sngp-npms/ti-it/ervcpgpmdsfvpmpteng.html

Department of Networking and Communications

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	Aditya Balaji Yalavarthy
Team Members	**Surada Shridhar** **Maniveer** ***Aditya Balaji***
Register Number	RA2011031010120
Date of Experiment	9-05-2022

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:

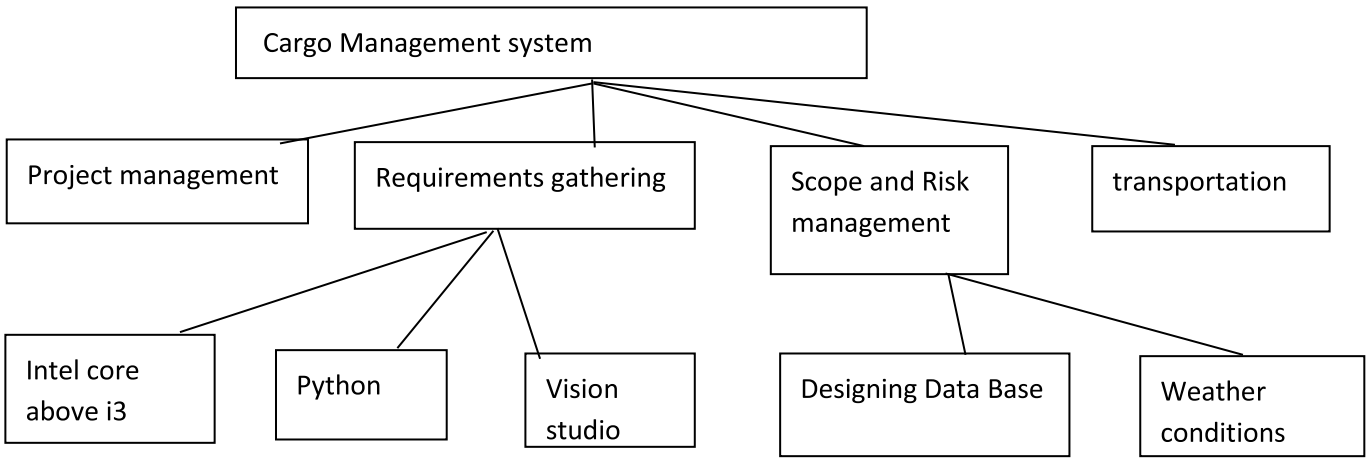
Sl No	Register No	Name	Role
1	**RA2011031010132**	Surada Shridhar	**Rep**
2	**RA2011031010120**	Aditya Balaji	**Member**
3	**RA2011031010127**	Maniveer	**Member**

<Incorporate WBS, Timeline chart and Risk table>

Result:

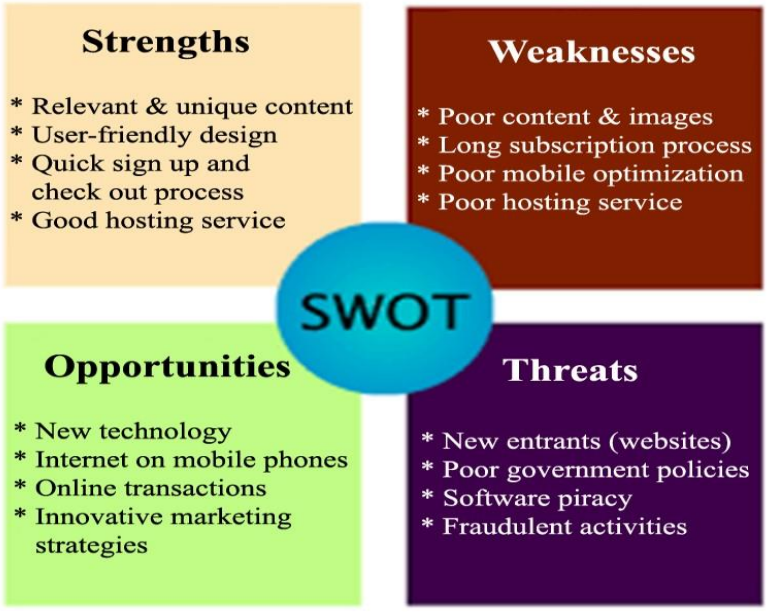
Thus, the work breakdown structure with timeline chart and risk table were formulated successfully.

WBS

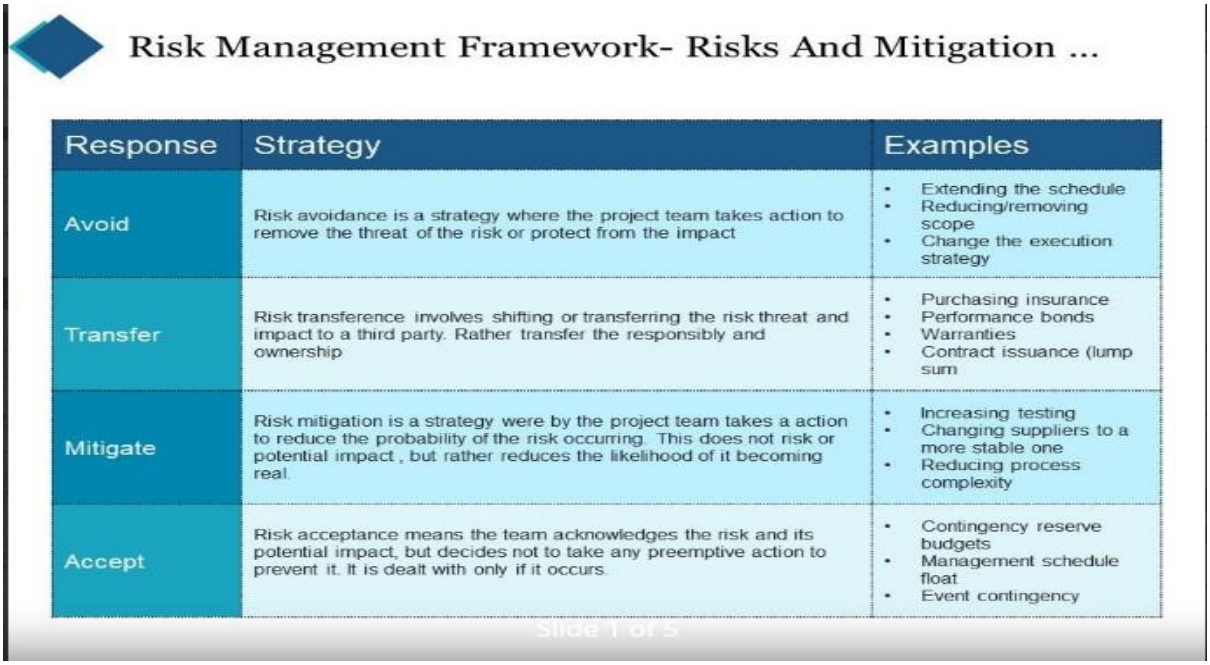


TIMELINE – GANTT CHART

RISK ANALYSIS – SWOT & RMMM



SWOT Analysis	
Strengths	**Weaknesses**
• Excellent reputation • Loyal customers • Market leader	• Small business <$200K/year • Profit margin too low • Losing too many employees
Opportunities	**Threats**
• Expand to new, larger location • Buy local competitor to increase revenues • Sell business and start new career	• Low cost supplier opens • Employees start own company • Economic slowdown



Risk Source	Description
Risk repository	The risk repository is the history data containing the list of risks identified for completed projects. The risk repository can be used to arrive at a list of potential risks for the project. This risk repository can also be filtered based on risk sources, categories, and projects.
Checklist analysis	The risk identification checklist is a questionnaire that helps identify gaps and potential risks. It is developed based on experience and project type.
Expert judgement	Risk identification is also done by brainstorming with or interviewing experienced project participants, stakeholders, and subject matter experts.
Project status	The project status includes project status meeting reports, status reports, progress reports, and quality reports. These reports provide the current project progress, issues faced, and threshold violations. These provide insight into the status of the project and potential new risks.

Department of Networking and Communications

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	**Aditya Balaji Yalavarthy**
Team Members	Surada Sridhar Aditya Balaji T. Maniveer Reddy
Register Number	**RA2011031010120**
Date of Experiment	14-05-22

Mark Split Up

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

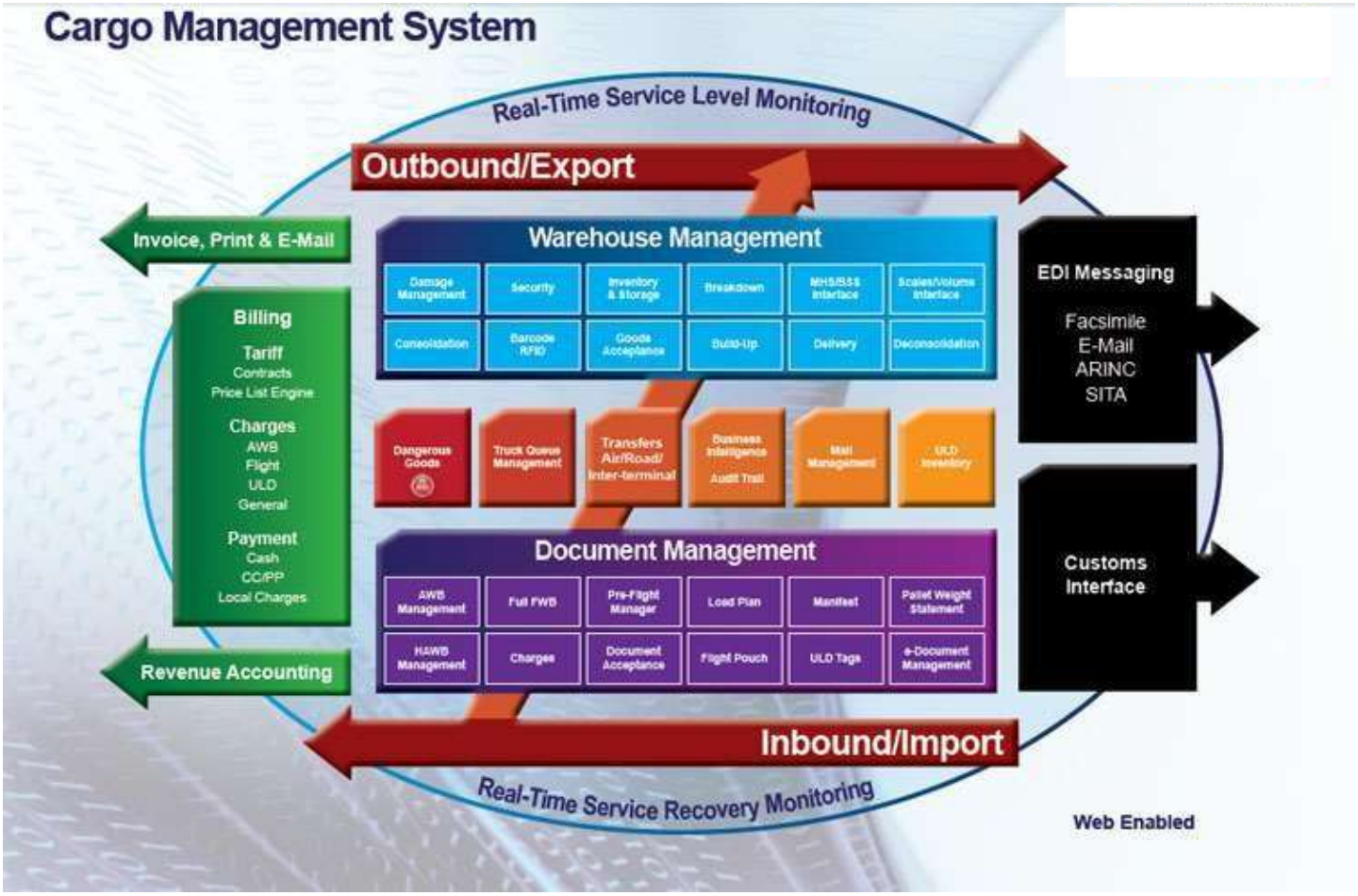
Staff Signature with date

AIM: To Design a System Architecture, Use case and Class Diagram

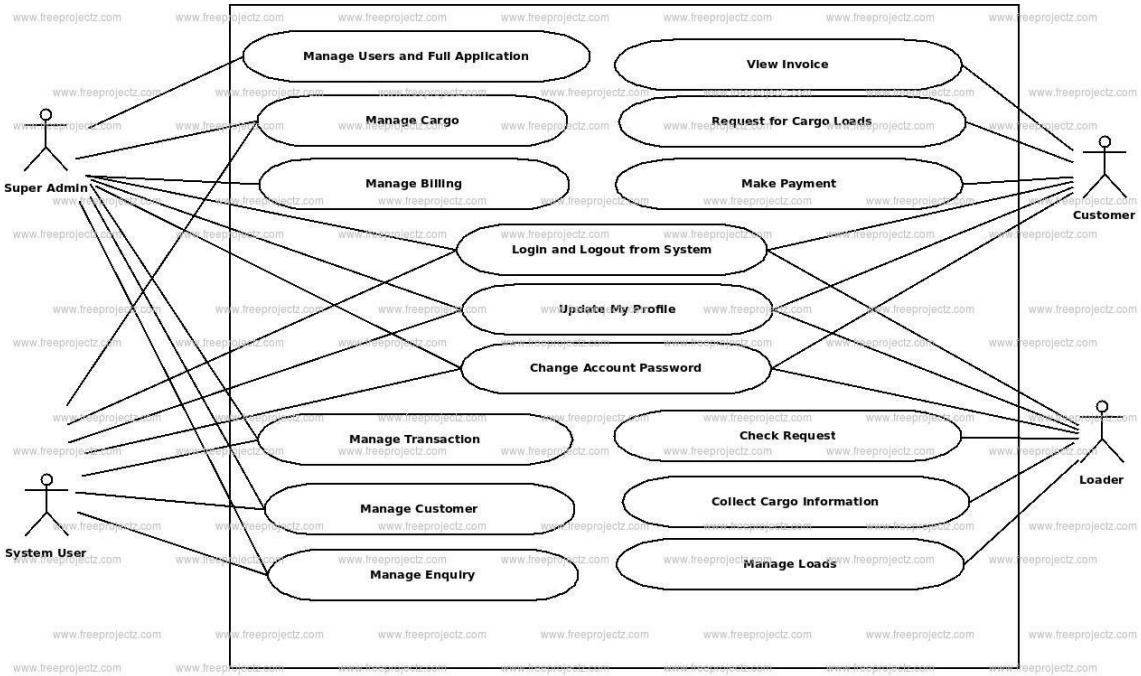
Team Members:

Sl No	Register No	Name	Role
1	RA2011031010132	Sridhar Surada	Rep
2	RA2011031010127	T. Maniveer Reddy	Member
3	RA2011031010120	Aditya Balaji	Member

SYSTEM ARCHITECTURE

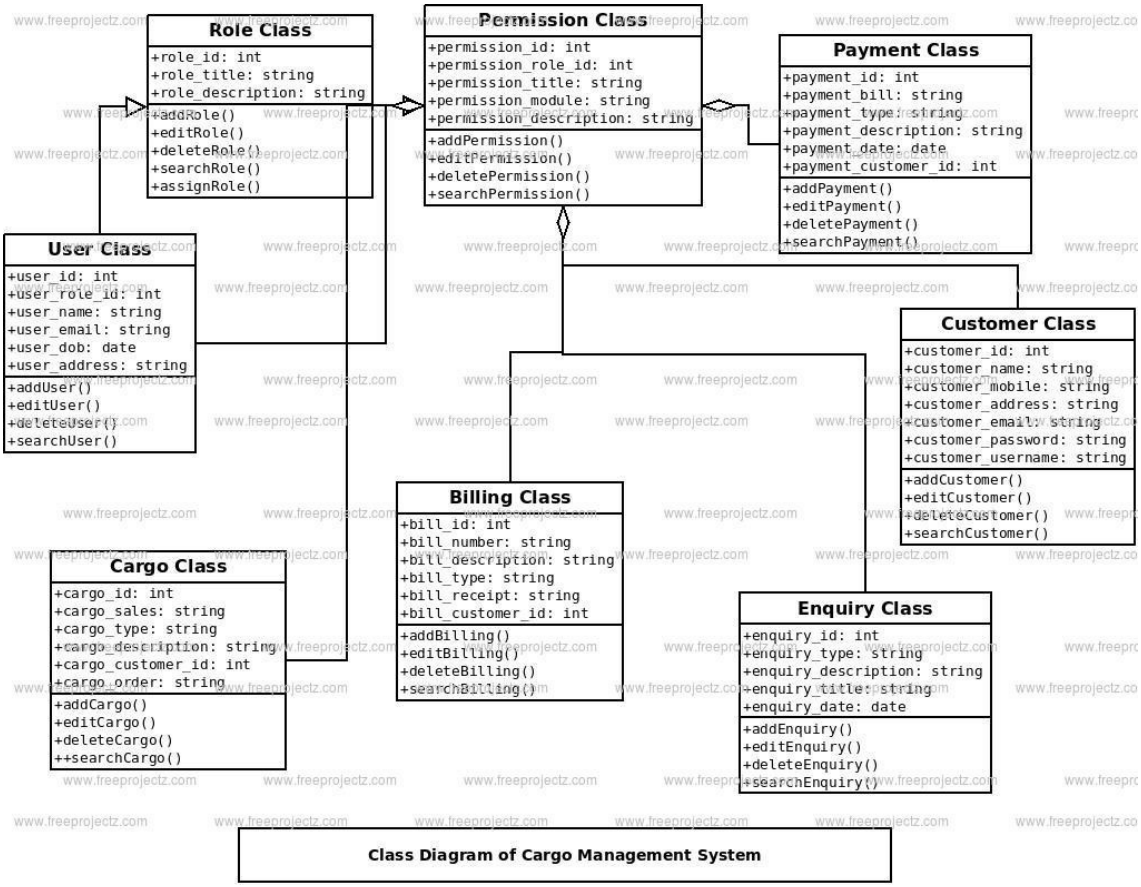


USE CASE DIAGRAM



Usecase Diagram of Cargo Management System

CLASS DIAGRAM



Result:

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

School of Computing

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	**Aditya Balaji Yalavarthy**
Team Members	Surada Shridhar Maniveer Reddy Aditya Balaji Yalavarthy
Register Number	**RA2011031010120**
Date of Experiment	16-05-22

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	RA2011031010132	Surada Shridhar	**Rep**
2	RA2011031010127	Maniveer Reddy	**Member**
3	RA2011031010120	Aditya Balaji Yalavarthy	**Member**

<ER Diagram >

Result:

Thus, the entity relationship diagram was created successfully.

<u>*/ ER Diagram, Notation and Example</u> 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

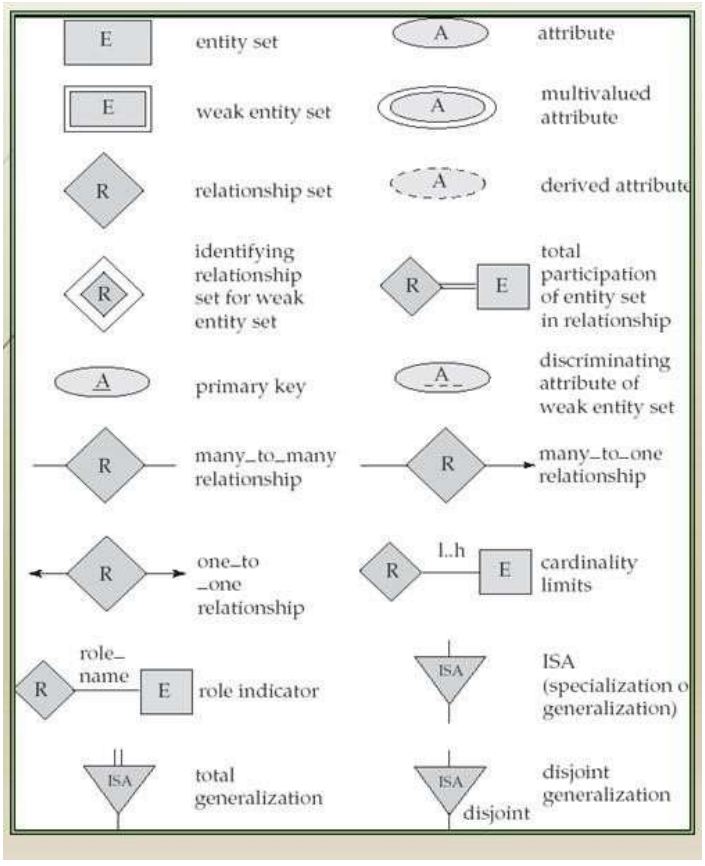
- Helps to describe entities, attributes, relationships
- ER diagrams are translatable into relational tables which allows you to build databases quickly
- ER diagrams can be used by database designers as a blueprint for implementing data in specific software applications
- The database designer gains 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

Components of the ER Diagram

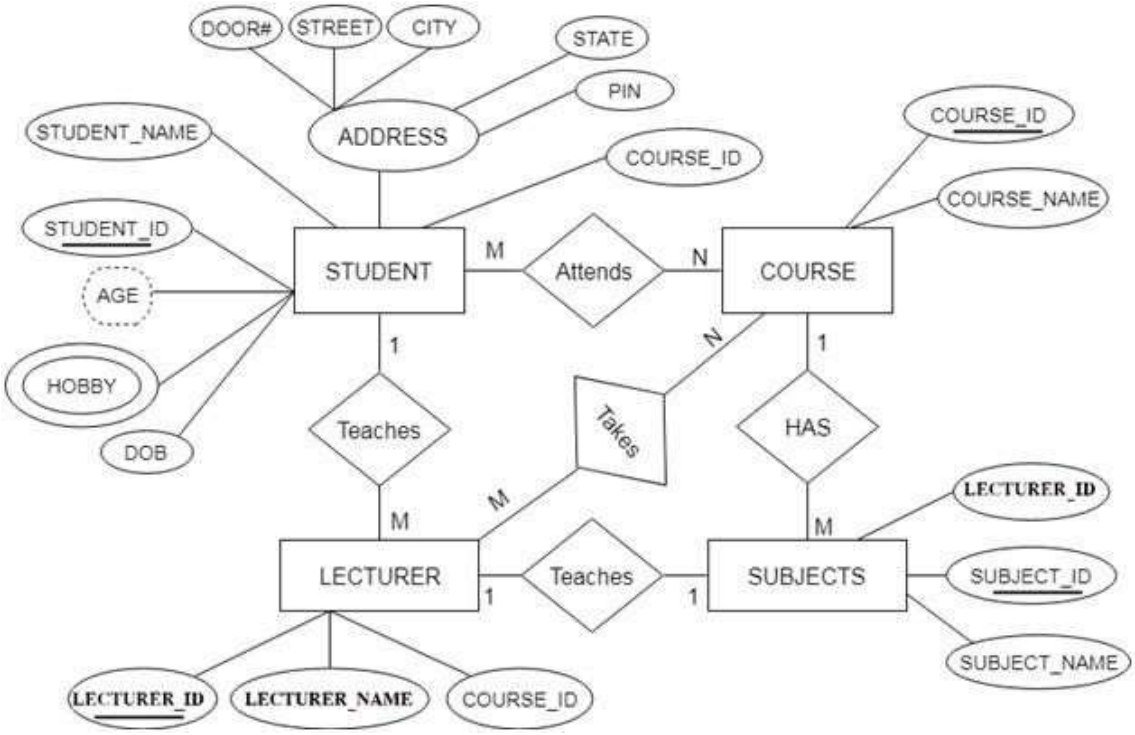
This model is based on three basic concepts: Entities, Attributes, Relationships

ER Diagram – Notations

- Rectangles represent entity sets.
- Diamonds represent relationship sets.
- Lines link attributes to entity sets and entity sets to relationship sets.
- Ellipses represent attributes
- Double ellipses represent multivalued attributes.- Dashed ellipses denote derived attributes.
- Underline indicates primary key attributes



ER Diagram of University Database



ADDITIONAL NOTES

- A database can be modeled as a collection of entities, relationship among entities.
- An entity is an object that exists and is distinguishable from other objects.Example: specific person, company, event, plant - Entities have attributes.

Example: people have names and addresses

- An entity set is a set of entities of the same type that share the same properties.Example: set of all persons, companies, trees, holidays

- Express the number of entities to which another entity can be associated via a relationship set.
- Most useful in describing binary relationship sets.
- We express cardinality constraints by drawing either a directed line (->), signifying "one," or an undirected line (—), signifying "many," between the relationship set and the entity set.

- An entity is represented by a set of attributes, that is descriptive properties possessed by all members of an entity set.

Example: customer = (customer-id, customer-name, customer-street, customer-city)
loan = (loan-number, amount)

- Domain – the set of permitted values for each attribute - Attribute types:

1. Simple and composite attributes.
2. Single-valued and multi-valued attributes

E.g. multivalued attribute: phone-numbers

3. Derived attributes-Can be computed from other attributes
E.g. age, given date of birth

Cardinality

- For a binary relationship set the mapping cardinality must be one of the following types:

1. One to one

A customer is associated with at most one loan via the relationship borrower. A loan is associated with at most one customer via borrower

2. One to many

A loan is associated with at most one customer via borrower, a customer is associated with several (including 0) loans via borrower

3. Many to one

A loan is associated with several (including 0) customers via borrower, a customer is associated with at most one loan via borrower

4. Many to many

A loan is associated with several (including 0) customers via borrower, a customer is associated with several loans (including 0) via borrower

Weak Entity Set

- An entity set that does not have a primary key is referred to as a weak entity set and represented by double outlined box in E-R diagram.

Example : Consider the entity set payment which got three attributes : payment_number, payment_date and payment amount. Payment numbers are sequential starting from 1 generally separately for each loan. Although each payment entity is distinct, payments for different loans may share the same payment number. Thus this entity set does not have a primary key.

Discriminator

- The discriminator (or partial key) of a weak entity set is the set of attributes that distinguishes among all the entities of a weak entity set

Example: discriminator of weak entity set payment is the attribute payment_number since for each loan a payment number uniquely identifies one single payment for that loan.

Specialization-Generalization-ISA

- E-R model provides means of representing these distinctive entity groupings
- Process of designating subgroupings within an entity set is called specialization depicted by triangle component labelled ISA ("is a")
- Bottom up design process in which multiple entity sets are synthesized into higher level entity set - Generalization
- ISA relationship may also be referred to as superclass-subclass relationship
- Higher and lower level entity sets are designated by the terms superclass and subclass.- Specialization and generalization are simple inversions of each other; they are represented in an E-R diagram in the same way.

Total & Partial Participation

- Total participation (indicated by double line): every entity in the entity set participates in at least one relationship in the relationship set

E.g. participation of loan in borrower is total, every loan must have a customer associated to it via borrower

- Partial participation: some entities may not participate in any relationship in the relationship set

Example: participation of customer in borrower is partial

Cardinality limits

- Cardinality limits can also express participation constraints
- Minimum and maximum cardinality is expressed as l..h where l is the minimum and h is the maximum cardinality
- Minimum value of 1 indicates total participation of entity set in relationship set- Maximum value of 1 indicates entity participates in atmost one relationship set. - Maximum value of * indicates no limit

Role indicator

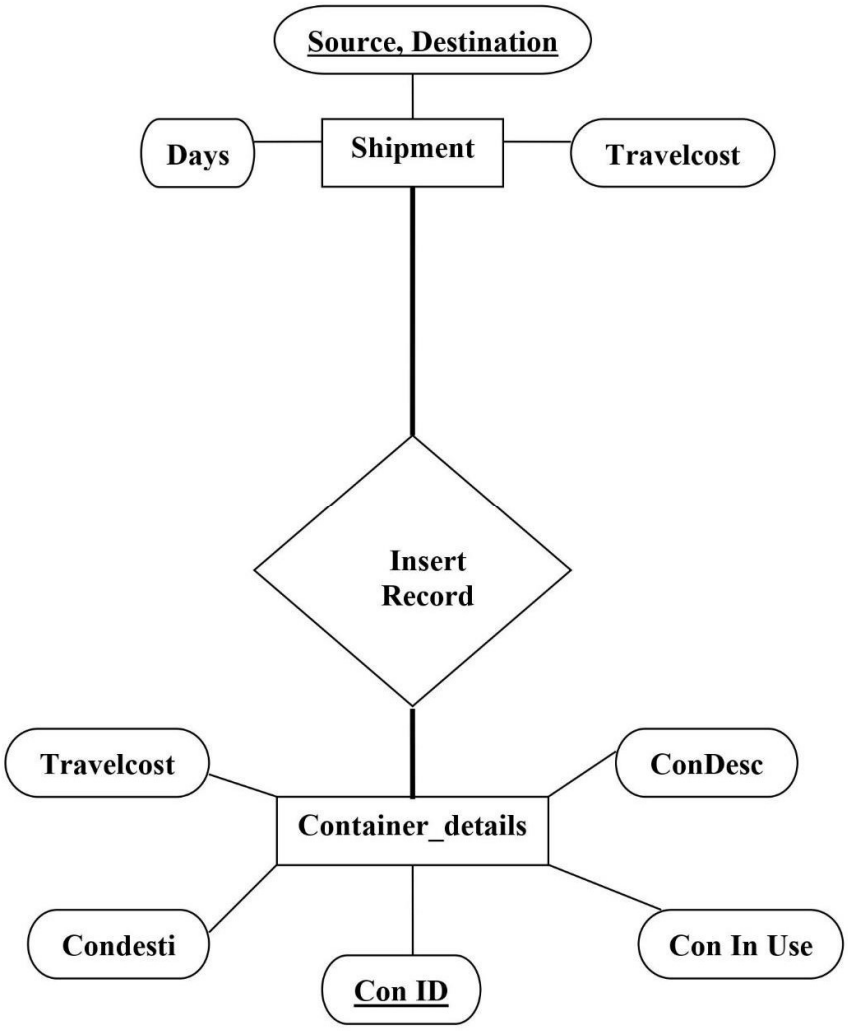
- Entity sets of a relationship need not be distinct
- The labels “manager” and “worker” are called roles; they specify how employee entities interact via the works-for relationship set.
- Roles are indicated in E-R diagrams by labeling the lines that connect diamonds to rectangles.
- Role labels are optional, and are used to clarify semantics of the relationship

Disjoint Generalization

- Disjointness constraint requires that an entity belong to more than one lower level entity set.

Example: account entity can satisfy only one condition for account_type attribute ; entity can either be savings or chequing account but not both.

ER DIAGRAM OF CARGO MANAGEMENT SYSTEM:



Result:

Thus, the entity relationship diagram was created successfully.

School of Computing

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	**Aditya Balaji Yalavarthy**
Team Members	Surada Shridhar Aditya Yalavarthy Maniveer Reddy
Register Number	RA2011031010120
Date of Experiment	03-06-2022

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 data flow diagram up to level 1 for the cargo management system

Team Members:

S No	Register No	Name	Role
1	RA2011031010132	Shridhar Surada	**Rep**
2	RA2011031010120	Aditya Yalavarthy	**Member**
3	RA2011031010127	Maniveer Reddy	**Member**

<DFD >

Result:

Thus, the data flow diagrams have been created for the <project name>.

Data Flow Diagram

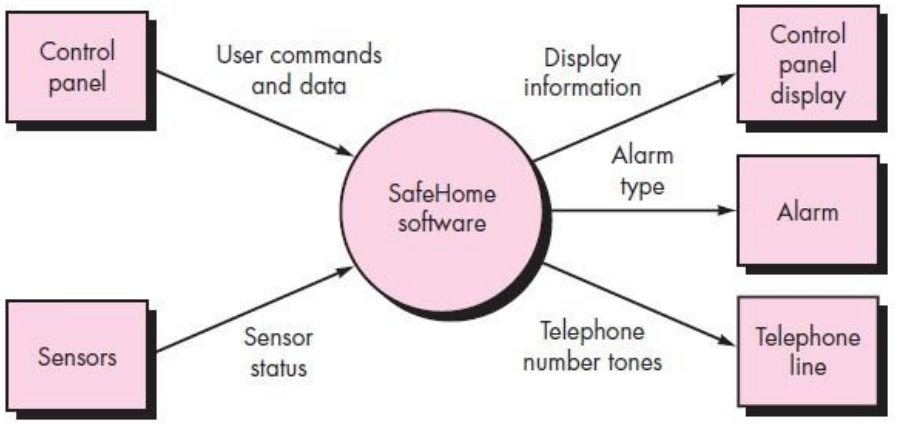
The DFD takes an input-process-output view of a system. That is, data objects flow into the software, are transformed by processing elements, and resultant data objects flow out of the software. Data objects are represented by labeled arrows, and transformations are represented by circles (also called 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 asingle 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**

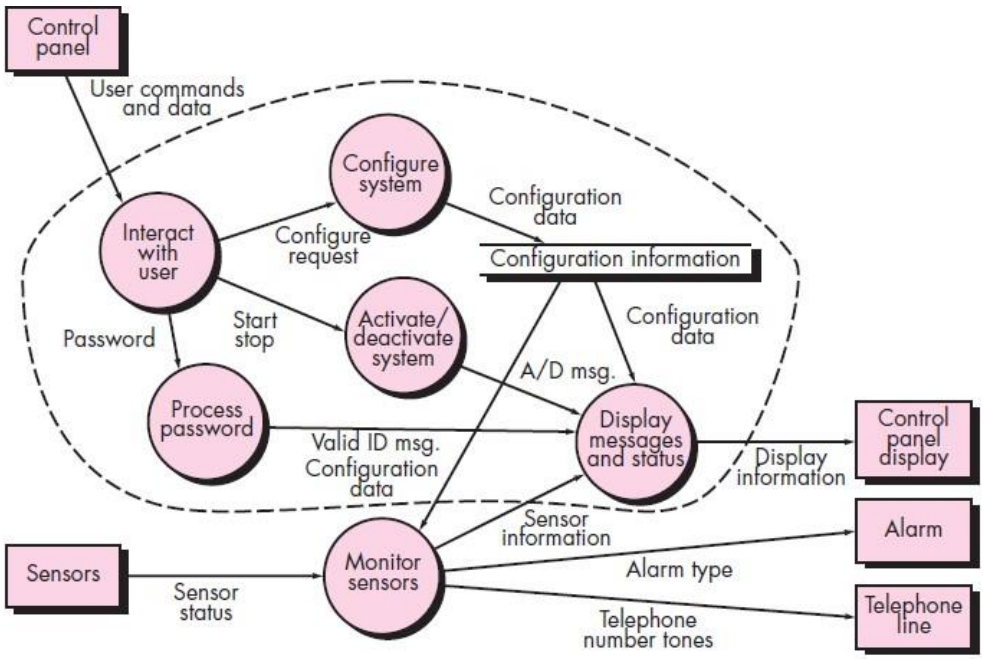
DFD Level 0

Context-level DFD for the *SafeHome* security function



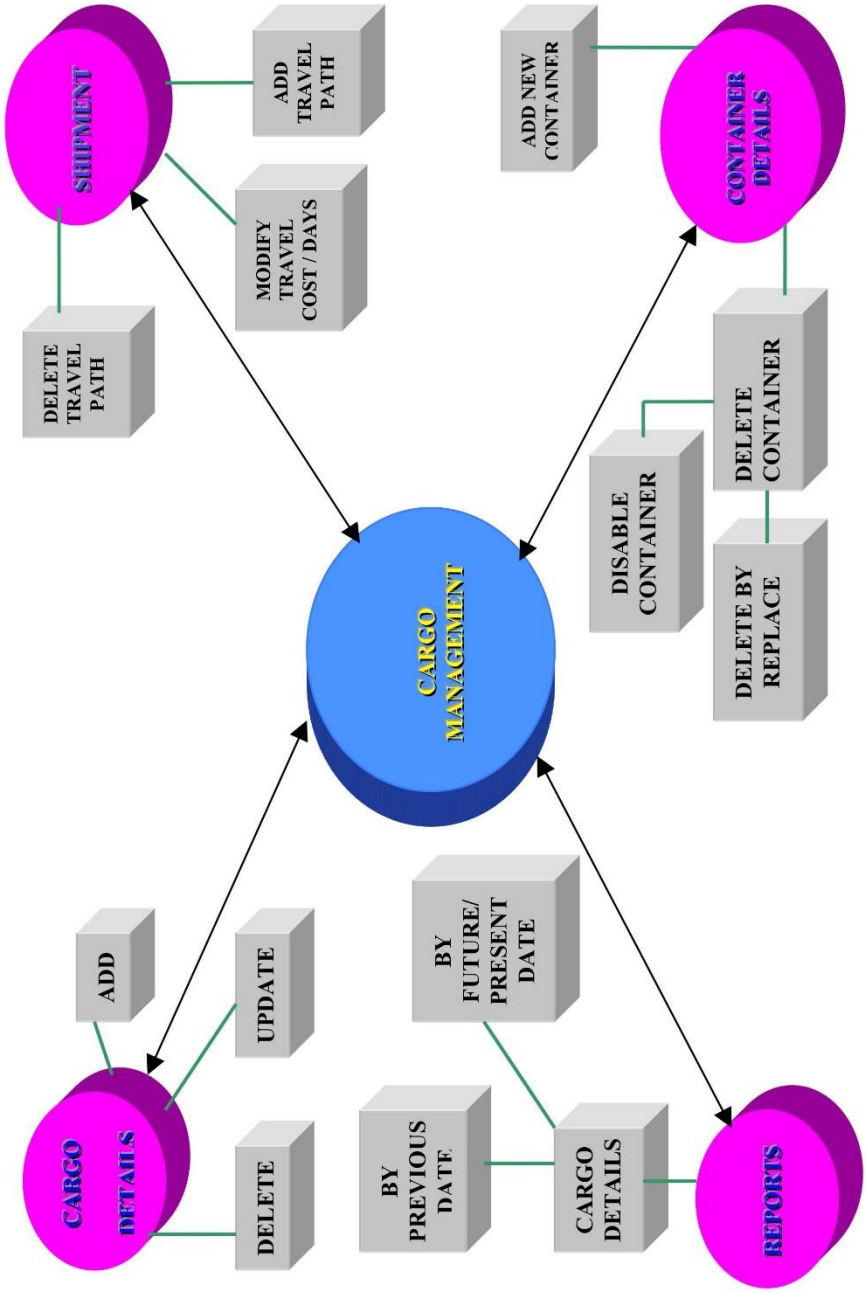
DFD Level 1

Level 1 DFD for the *SafeHome* security function



DATA FLOW DIAGRAM 1

DATA FLOW DIAGRAM 2



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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	**Aditya Balaji Yalavarthy**
Team Members	Shridhar Surada Maniveer Reddy Aditya Balaji Yalavarthy
Register Number	RA2011031010120
Date of Experiment	06-06-2022

Mark Split Up

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

Staff Signature with date

Aim

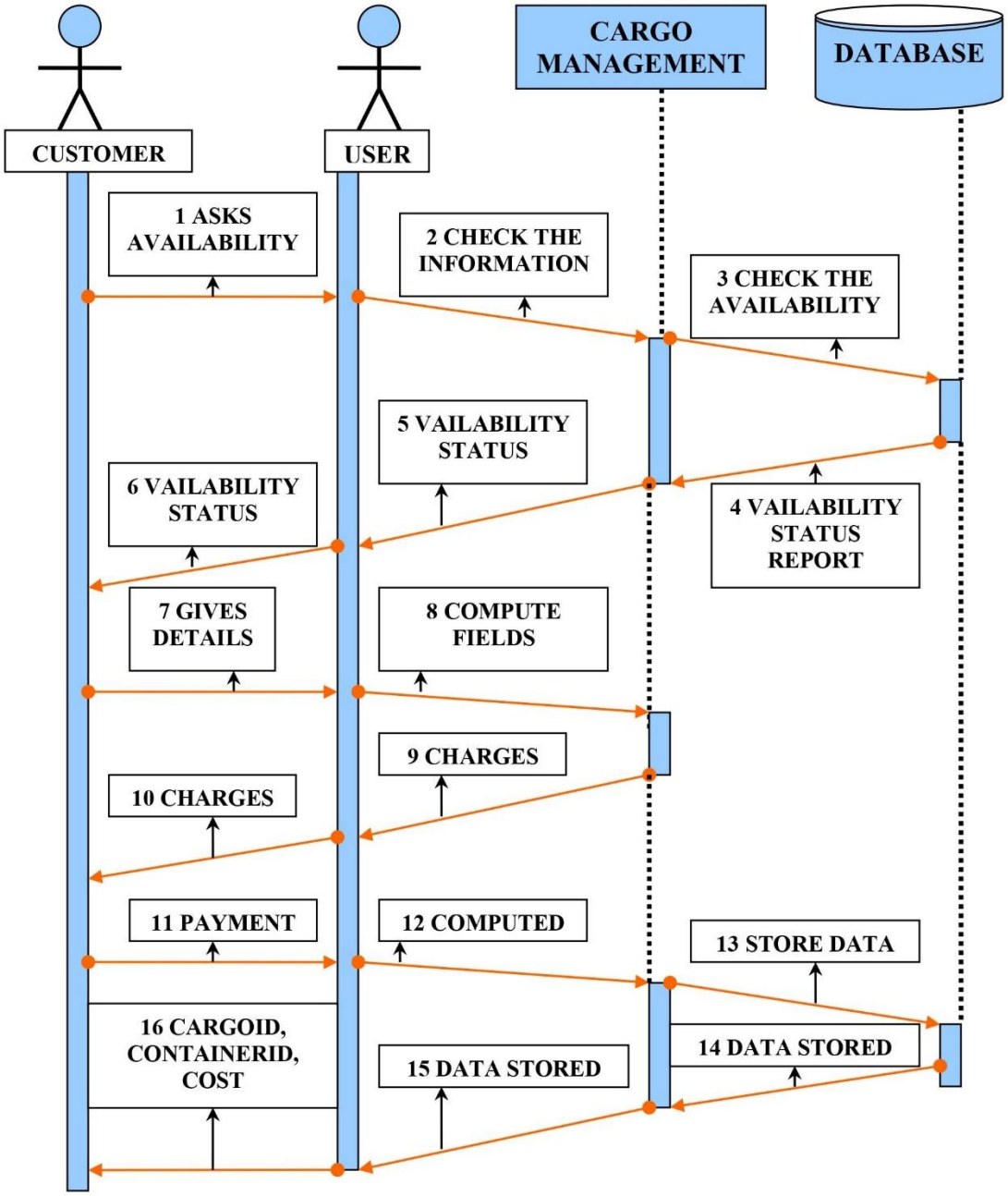
To create the sequence and collaboration diagram for the <project name>

Team Members:

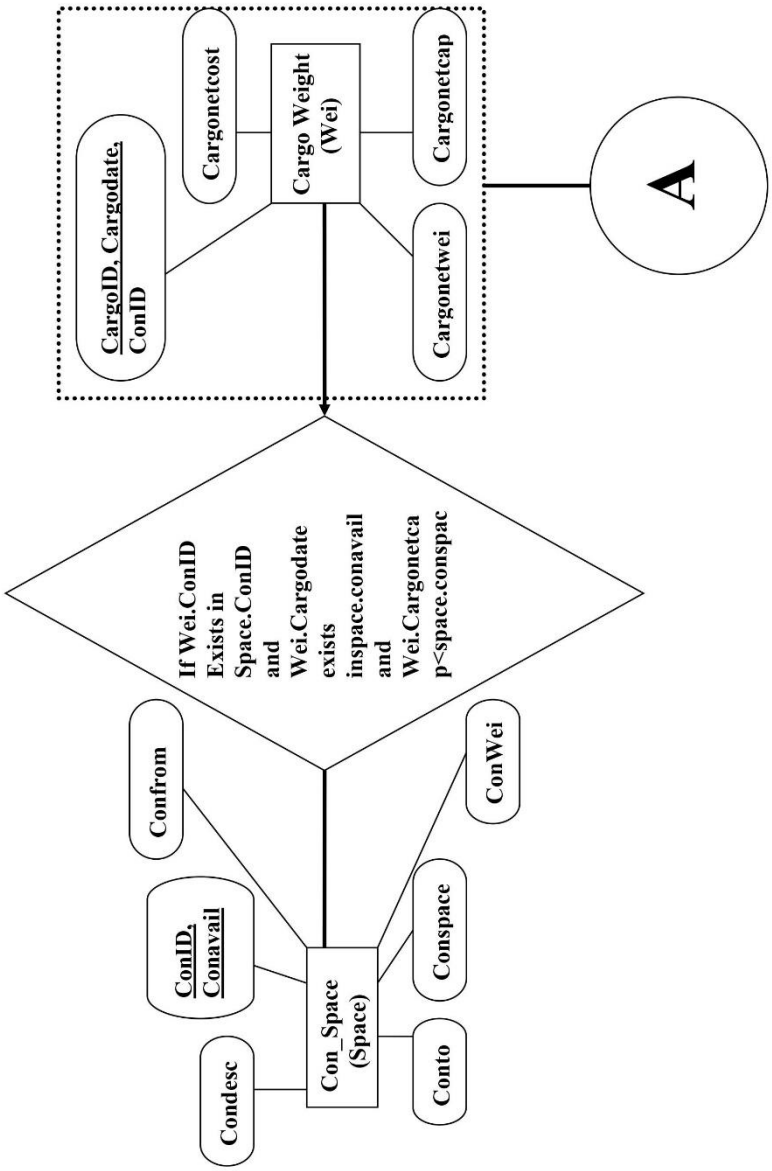
S No	Register No	Name	Role
1	RA2011031010132	Surada Shridhar	**Rep/Member**
2	RA2011031010127	Maniveer Reddy	**Member**
3	RA2011031010120	Aditya Balaji	**Member**

<Sequence and Collaboration Diagram>

SEQUENCE DIAGRAM



COLLABORATION DIAGRAM

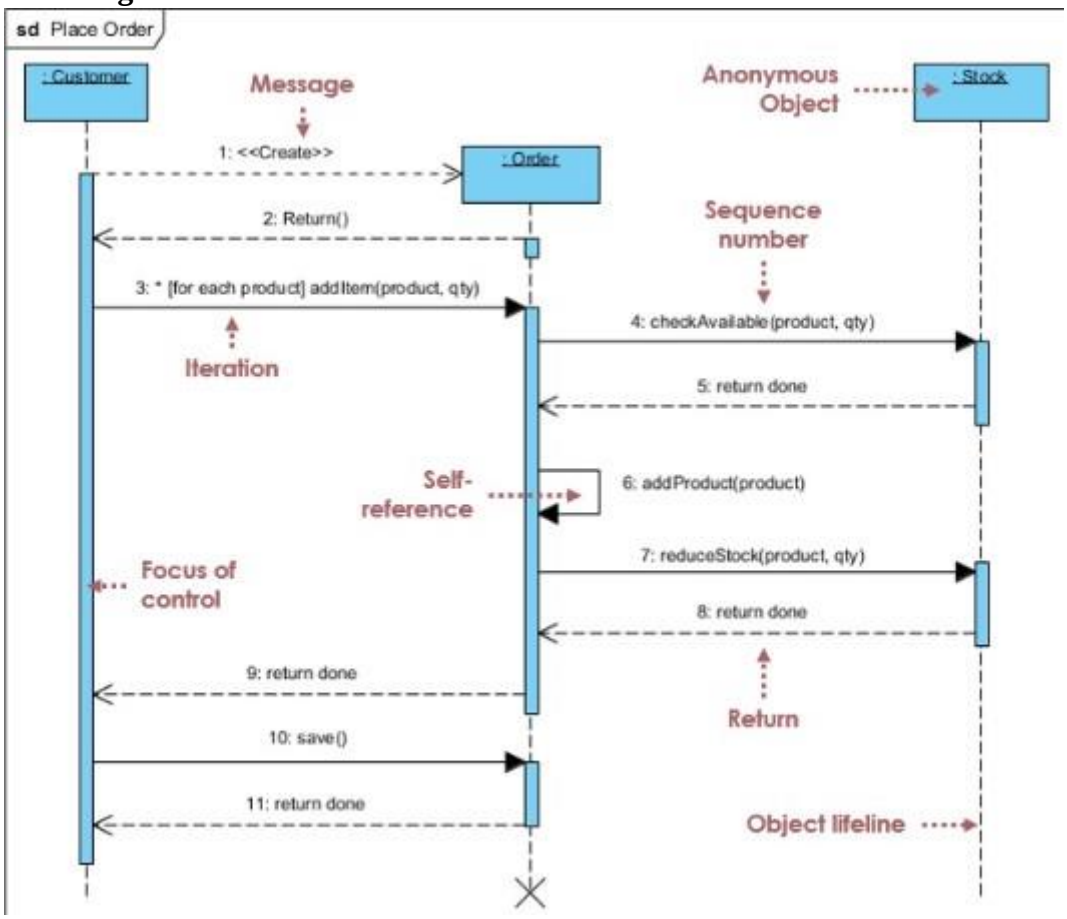


Result:

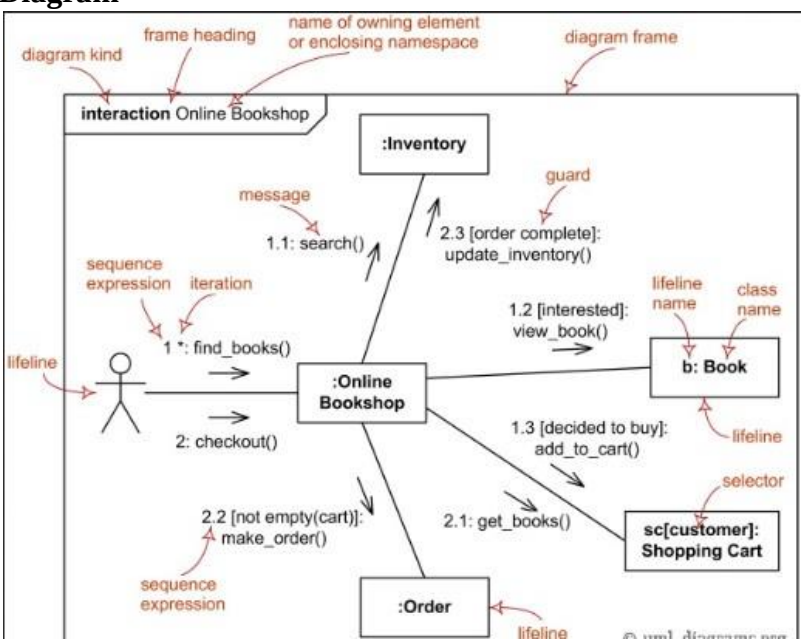
Thus, the sequence and collaboration diagrams were created for the <project name>.

***/ For Example**

Sequence Diagram



Collaboration Diagram



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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	**Aditya Balaji Yalavarthy**
Team Members	*Surada Shridhar* *Aditya Yalavarthy* *Maniveer Reddy*
Register Number	RA2011031010120
Date of Experiment	10-12-2022

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 <project name>

Team Members:

S No	Register No	Name	Role
1	RA2011031010132	Surada Shridhar	Rep/Member
2	RA2011031010120	Aditya Yalavarthy	Member
3	RA2011031010127	Maniveer Reddy	Member

<Incorporate the necessary information regarding testing/user interface of the project>

Result:

Thus, the testing framework/user interface framework has been created for the <project name>.

***/ For example**

Executive Summary

<<defines the scope, objective, and approach to test the software application>>

Scope of the project: Project scope is the part of project planning that involves determining and documenting a list of specific project goals, deliverable, features, functions, tasks, deadlines, and ultimately costs. In other words, it is what needs to be achieved and the work that must be done to deliver a project.

Objective:

- To develop a software that allows live tracking of the cargo that comes through online shopping
- To inform the customer if there is a delay of cargo
- To give the current location of cargo to customer
- To make use of online platforms for less customer inconvenience.

Approach required to test this application:

Step 1. Outlining the process

Step 2. Choosing the type of mobile testing

Step 3. Preparing test cases for different functionality

Step 4. Manual testing

Step 5.Automated testing

Step 6. Usability and beta testing

Step 7. Performance testing

Step 8. Security and compliance testing

After these approaches tested, we are going to the final step:

Step 9. Final version release

Test Plan

Scope of Testing

<<summarize the scope of testing >

Functional: Are all modules covered? Any exception for any modules ? Does automation cover all functional test cases or Regression – Critical Path Test Cases ?

1] Dynamic web interface

2] System authorities.

3] Personal information.

4] Cargo information

5] The system shall support multiple

Non-Functional: Are all NFR (Non-Functional Requirements) covered?

1] Performance

2] Availability

3] Scalability

4] Confidentiality

5] Compliance

6] Usability

7] Reliability

Types of Testing, Methodology, Tools

Category	Methodology	Tools Required
Functional Requirements	Manual	By opening the website and checking all the functional requirements as mentioned above.
Non - Functional Requirements	Manual, Automation	By opening the website and checking all the non-functional requirements as mentioned above. And test cases are successful.

Result:
Thus, the testing framework/user interface framework has been created for the Cargo management.

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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	**Aditya Balaji Yalavarthy**
Team Members	Surada Shridhar Aditya Yalavarthy Maniveer Reddy
Register Number	RA2011031010120
Date of Experiment	6/6.2022

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 <project name>

Team Members:

S No	Register No	Name	Role
1	Surada Shridhar	**RA2011031010132**	**Rep**
2	Aditya Yalavarthy	**RA2011031010120**	**Member**
3	Maniveer Reddy	**RA2011031010127**	**Member**

<Utilize the templates below and incorporate the project's test cases - Manual Test case to be written for at least one module >

Result:

Thus, the test case manual has been created for the <project name>.

***/ For example**

Test Case

Functional Test Cases

Test ID (#)	Test Scenario	Test Case	Execution Steps	Expected Outcome	Actual Outcome	Status	Remarks

1	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	Number registered into the database and taken forward to the next step	Pass	success
2	Verify User Registration from India	Don't Accept Non IndianMobile Number on the Page#1	1.User clicks on User Registration link and separate tab for foreign mobile entry	User should be taken to the next page for entering more user details	Number registered into the database and taken forward to the next step	pass	success
3	verify the cargo details and destination	Accept the valid cargo details and show the location	User should enter 1. the cargo details 2. the company from which cargo is brought	User will be given the location in which location cargo has recently passed	User details are verified in the database and taken forward to the next step	pass	success

Non-Functional Test Cases

Test ID (#)	Test Scenario	Test Case	Execution Steps	Expected Outcome	Actual Outcome	Status	Remarks
1	Performance	Performance of the database based on the increase in number of users	Allowing more user to login into the application	Stability and Scalability of application	May not provide scalability for large number of users	pass	Success

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SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	12
Title of Experiment	Manual Test Case Reporting
Name of the candidate	Aditya Balaji Yalavarthy
Team Members	Maniveer Reddy Aditya Balaji Yalavarthy Shridhar Surada
Register Number	RA2011031010120
Date of Experiment	18-06-2022

Mark Split Up

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

Staff Signature with date

Aim

To prepare the manual test case report for the <project name>

Team Members:

S No	Register No	Name	Role
1	**RA2011031010132**	**Shridhar Surada**	**Rep/Member**
2	**RA2011031010127**	**Maniveer Reddy**	**Member**
3	**RA2011031010120**	**Aditya Balaji Yalavarthy**	**Member**

Requirements#	Defect ID#	Defect Description	Assignee	Status
M1R1	ID 1	Incorrect display of location of Cargoes	Maniveer Reddy	COMPLETED
M1R2	ID 2	An application consumes too much of the device's resources	Shridhar Surada	WORKING
M1R3	ID 3	The application isn't launched in the first 5-10 sec	Aditya Balaji Yalavarthy	WORKING

Category	**Progress Against Plan**	**Status**
Functional Testing	Green	Completed
Non-Functional Testing	Amber	In-Progress

Functional	**Test Case Coverage (%)**	**Status**
Module ID 1	100%	Completed
Module ID 2	70%	In-Progress
Module ID 3	80%	In-Progress

Result:

Thus, the test case report has been created for the Cargo Management Systems.

School of Computing

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	13
Title of Experiment	Providethe details of Architecture Design/Framework/Implementation
Name of the candidate	**Aditya Balaji Yalavarthy**
Team Members	Maniveer Reddy Surada Shridhar Aditya Balaji Yalavarthy
Register Numbers	RA2011031010120
Date of Experiment	18-06-22

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

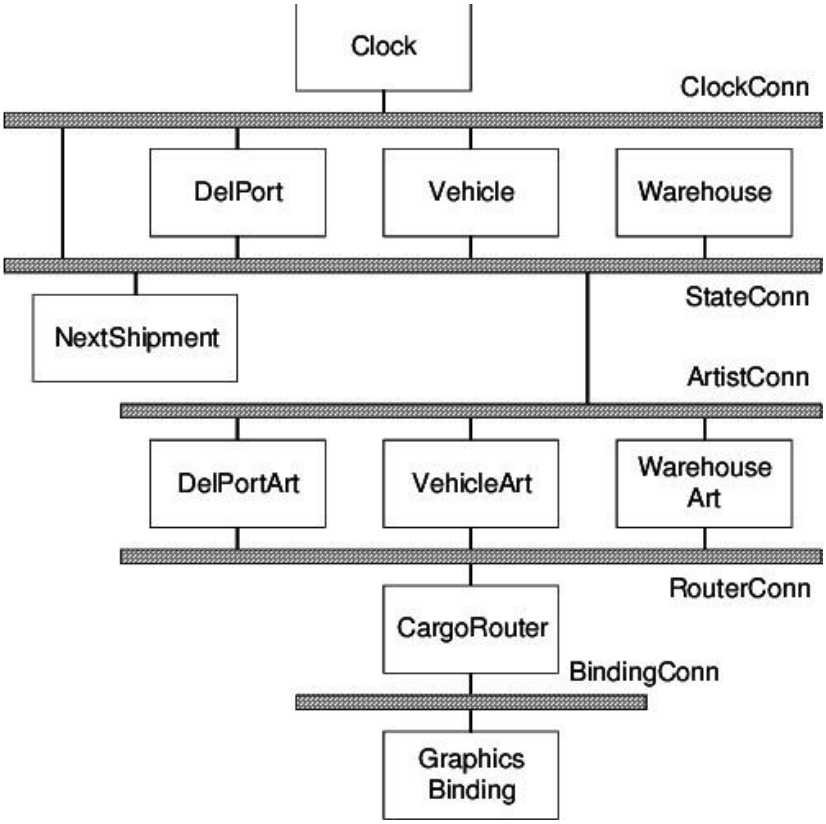
Team Members:

S No	Register No	Name	Role
1	RA2011031010132	Surada Shridhar	Rep/Member
2	RA2011031010127	Maniveer Reddy	Member
3	RA2011031010120	Aditya Balaji Yalavarthy	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

Architectural design



CARGO DETAILS:

CODE:

id-int(30) branch_code

varchar(50) street text city text

state text zip_code int(6)

country text contact int(10)

date_created datetime cargo_id

int(30) primary key

reference_number varchar(100)

sender_name text

sender_address text

recipinent_name text

recipient_address text

recipient_contact text type

int(1) from_branch_id

varchar(30) to_branch_id

varchar(30) weight

varchar(100) height

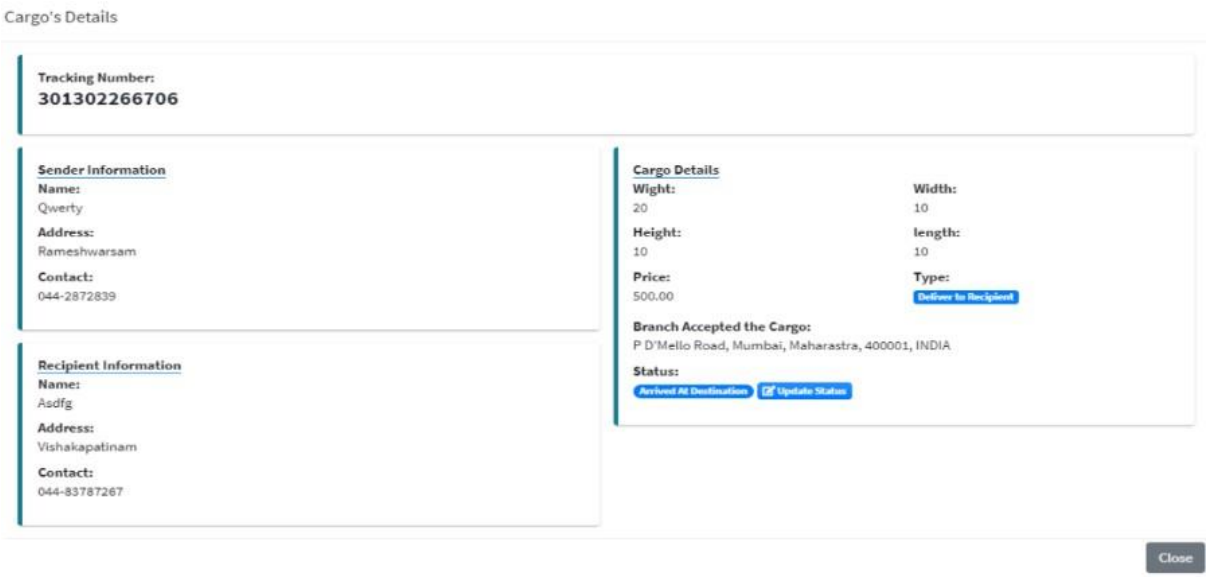
varchar(100) width

varchar(100) length

varchar(100) price float status

int(2)

#	Name	Type	Collation	Attributes	Null	Default	Comments
1	cargo_id	int(30)			No	None	
2	reference_number	varchar(100)	utf8mb4_general_ci		No	None	
3	sender_name	text	utf8mb4_general_ci		No	None	
4	sender_address	text	utf8mb4_general_ci		No	None	
5	sender_contact	text	utf8mb4_general_ci		No	None	
6	recipient_name	text	utf8mb4_general_ci		No	None	
7	recipient_address	text	utf8mb4_general_ci		No	None	
8	recipient_contact	text	utf8mb4_general_ci		No	None	
9	type	int(1)			No	None	1 = Deliver, 2=Pickup
10	from_branch_id	varchar(30)	utf8mb4_general_ci		No	None	
11	to_branch_id	varchar(30)	utf8mb4_general_ci		No	None	
12	weight	varchar(100)	utf8mb4_general_ci		No	None	
13	height	varchar(100)	utf8mb4_general_ci		No	None	
14	width	varchar(100)	utf8mb4_general_ci		No	None	
15	length	varchar(100)	utf8mb4_general_ci		No	None	
16	price	float			No	None	
17	status	int(2)			No	0	
18	date_created	datetime			No	current_timestamp()	



<u>CARGO TRACKING:</u>

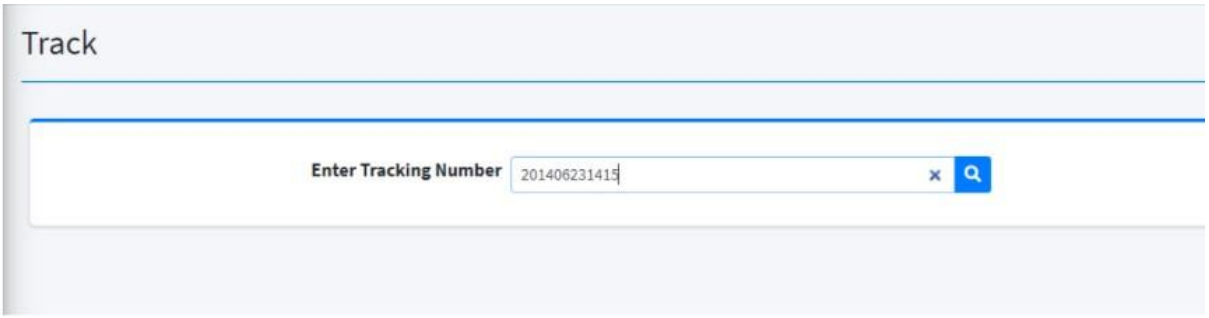
<u>CODE:</u>

cargo_id int(30)

parcel_id int(30) status

int(2) date_created

datetime



cargo_id	parcel_id	status	date_created
1	2	1	2020-11-27 09:53:27
2	3	1	2020-11-27 09:55:17
3	1	1	2020-11-27 10:28:01
4	1	2	2020-11-27 10:28:10
5	1	3	2020-11-27 10:28:16
6	1	4	2020-11-27 11:05:03
7	1	5	2020-11-27 11:05:17
8	1	7	2020-11-27 11:05:26
9	3	2	2020-11-27 11:05:41
10	6	1	2020-11-27 14:06:57

SYSTEM SETTINGS: CODE:

id int(30) primary key

name text email

varchar(200) contact

vaarchar(10) address

text cover_img text id

int(30) primary key

firstname

varchar(200) lastname

varchar(200) email

varchar(200) password

text type tinyint(1)

branch_id int(30)

date_created datetime

#	Name	Type	Collation	Attributes	Null	Default
1	id	int(30)			No	None
2	name	text	utf8mb4_general_ci		No	None
3	email	varchar(200)	utf8mb4_general_ci		No	None
4	contact	varchar(20)	utf8mb4_general_ci		No	None
5	address	text	utf8mb4_general_ci		No	None

	#	Name	Type	Collation	Attributes	Null	Default	Comments
☐	1	id	int(30)			No	None	
☐	2	firstname	varchar(200)	utf8mb4_general_ci		No	None	
☐	3	lastname	varchar(200)	utf8mb4_general_ci		No	None	
☐	4	email	varchar(200)	utf8mb4_general_ci		No	None	
☐	5	password	text	utf8mb4_general_ci		No	None	
☐	6	type	tinyint(1)			No	2	1 = admin, 2 = staff
☐	7	branch_id	int(30)			No	None	
☐	8	date_created	datetime			No	current_timestamp()	

ACCOUNT:

CODE:

reference_number varchar(100)

price int(11) mode tinyint(4)

#	Reference Number	Amount	Status	
1	117967400213	2500	2	Card
2	201406231415	2500	1	Cash
3	505604168988	2500	3	Net Banking
4	514912669061	1900	2	Card
5	897856905844	1450	10	DUE
6	983186540795	1500	12	DUE

Result:

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