



**DEPT. Of NWC**

**SRM IST, Kattankulathur – 603 203**

**Course Code: 18CSC206J**

**Course Name: Software Engineering and Project Management**

<b>Experiment No</b>	1
<b>Title of Experiment</b>	To identify the Software Project, Create Business Case, Arrive at a Problem Statement
<b>Name of the candidate</b>	Shubhangi Srivastava
<b>Team Members</b>	Dhawal Gupta, Shantanu Sahay
<b>Register Number</b>	RA2011028010076
<b>Date of Experiment</b>	16-3-2022

**Mark Split Up**

<b>S.No</b>	<b>Description</b>	<b>Maximum Mark</b>	<b>Mark Obtained</b>
1	Exercise	5	
2	Viva	5	
<b>Total</b>		<b>10</b>	

**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 <Online Private Tutor Finder>

## Team Members:

Sl No	Register No	Name	Role
1	RA2011028010076	Shubhangi Srivastava	Lead
2	RA2011028010078	Shantanu Sahay	Member
3	RA2011028010081	Dhawal Gupta	Member

## Project Title: Online Private Tutor Finder

**Project Description:** This system will help to find tuition teachers from nearby locations.

Teachers can also get student just by logging into the website and setting up the profile. In the system there are three entities namely, Admin, Parents and Tutor.

## Business Case

<Incorporate the Business Case template>

# ONE PAGE BUSINESS CASE TEMPLATE

DATE	14/03/2022
SUBMITTED BY	Shubhangi, Shantanu and Dhawal
TITLE / ROLE	Online Private Tutor Finder



## THE PROJECT

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

- This system will help to users to find tuition teachers from nearby locations. Teachers can also get student just by logging into the website and setting up the profile. In the system there are three entities namely, Admin, Parents and Tutor.
  1. Admin can login, manage tutor by adding new teachers and updating their profiles. Admin can also manage E books by adding new books into the library. Admin can also check for the registered parents. Admin will register tutors and credentials will be share to tutors by email.
  2. Parents can register and login, tutors can be viewed by parents. Parents can filter and select the tutor and after selecting parents will raise the request of demo lecture. After attending lecture, they can book the tutor online, rate the tutor and view the E Books.
  3. Tutor can login by using credentials which will be provided by mail. They can check for the request for demo lecture and accept the request. They can also check the booking done. They need to set their profile.

## THE HISTORY

In bullet points, describe the current situation.

- The system of private tuition has been in existence in India for a long time but in recent times it has grown manifold affecting the very core of educational system.
- This system can help the tutors to get students and parents to find the best tutors for their children's.
- TutorBird is one of the websites that provide online tutors to students on and provide them with class-based courses. The drawback of this is that they don't provide weekly aptitude tests that test the students skill so that concentrated attention can be provided.
- Byju's is also one of the website that is quite similar to it. The only difference is that in our site the teacher's is from nearby location so there won't be language barrier , parent's teacher interaction would be easier.
- Whitehat Jr they have specialization in only one particular subject.

## LIMITATIONS

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

- Data need to be entered properly otherwise; outcome may won't be accurate.
- The range of registration would be shorter at the beginning and expanding it would be a challenge.
- Applications face minor technical glitches and these systems are no exception.

## APPROACH

List what is needed to complete the project.

The system comprises of 2 major modules with their sub-modules as follows:

1. Admin:
  - Login: Admin can login using credentials.
  - Manage Tutor: Admin can add new tutor and tutor's information.
  - Manage E Books: Admin can add E books.
  - View Parents: Admin can check register parents.
2. Parent:
  - Register: Parents can register and obtain credentials.
  - Login: Parents can login using credentials.
  - View Tutor: Parents can check for tutors.
  - Request a Demo: Parents will select tutor and raise request for demo lecture.
  - Book a Tutor: Parents can book tutor.
  - View Booked Tutor: Parents can check the booked tutor
  - Rate Tutor: Parents can rate tutor.
  - View E Book: Parents can check the E books.

## BENEFITS

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

- Elimination of travel time for both parents and tutors.
- Parents can get highly qualified tutors at affordable prices.
- Tutors shares a wealth of knowledge, experience, and academic degrees which they have.

## **Result**

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



## Department of Networking and Communications

**SRM IST, Kattankulathur – 603 203**

**Course Code: 18CSC206J**

**Course Name: Software Engineering and Project Management**

<b>Experiment No</b>	2
<b>Title of Experiment</b>	Identification of Process Methodology and Stakeholder Description
<b>Name of the candidate</b>	Shubhangi Srivastava
<b>Team Members</b>	Shantanu Sahay, Dhawal Gupta
<b>Register Number</b>	RA2011028010076
<b>Date of Experiment</b>	20-3-2022

### Mark Split Up

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
<b>Total</b>		<b>10</b>	

**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	RA2011028010076	Shubhangi Srivastava	Rep/Member
2	RA2011028010078	Shantanu Sahay	Member
3	RA2011028010081	Dhawal Gupta	Member

## Project Title:

### Selection of Methodology

The waterfall Model is a linear sequential flow. In which progress is seen as flowing steadily downwards (like a waterfall) through the phases of software implementation. This means that any phase in the development process begins only if the previous phase is complete. The waterfall approach does not define the process to go back to the previous phase to handle changes in requirement. The waterfall approach is the earliest approach that was used for software development.

The waterfall model was selected as the SDLC model due to the following reasons:

- Requirements were very well documented, clear and fixed.
- Technology was adequately understood.
- Simple and easy to understand and use.
- There were no ambiguous requirements.
- Easy to manage due to the rigidity of the model. Each phase has specific deliverables and a review process.
- Clearly defined stages.
- Well understood milestones. Easy to arrange tasks.

### Waterfall vs Agile Key Difference

- Waterfall is a Liner Sequential Life Cycle Model whereas Agile is a continuous iteration of development and testing in the software development process.

- In Agile vs Waterfall difference, the Agile methodology is known for its flexibility whereas Waterfall is a structured software development methodology.

Incorporate information to below table regarding stakeholders of the project [Make use of below examples]

Stakeholder Name	Activity/ Area /Phase	Interest	Influence	Priority (High/ Medium/ Low)
Owner	Achieve target and make the application available to people	High	High	1
Sponsor	making key investment decisions and providing top-level endorsement of the rationale	Medium	Low	3
Project Team	Contribute to overall project objectives, Complete individual deliverables, provide expertise, Work with users to determine and meet business needs, Document the process	High	High	1
Investor	Provides necessary financial requirements	High	High	1
End User	Provides feedback	Low	High	3

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**

<b>Experiment No</b>	3
<b>Title of Experiment</b>	System, Functional and Non-Functional Requirements of the Project
<b>Name of the candidate</b>	Shubhangi Srivastava
<b>Team Members</b>	Shantanu Sahay(RA2011028010078) DHAWAL GUPTA (RA2011028010081)
<b>Register Number</b>	RA2011028010076
<b>Date of Experiment</b>	23-3-2022

### Mark Split Up

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
<b>Total</b>		<b>10</b>	

## **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	RA2011028010076	Shubhangi Srivastava	Rep/Member
2	RA2011028010078	Shantanu Sahay	Member
3	RA2011028010081	Dhawal Gupta	Member

### **Project Title: Online Tutor Finder**

### **System Requirements**

#### **1. Admin:**

**Login:- admin login using credentials.**

**manage tutor:- Admin can add new tutor and tutor's information.**

**Manage Ebooks:- admin can add Ebooks.**

**View Parents:- Admin can check register parents.**

#### **2. Parent/Students:**

**Register:- Parents/Students can register and obtain credentials.**

**Login:-Users can login using credentials.**

**View Tutor:- Users can search for tutors.**

**Request a Demo:-Users will select tutor and raise request for demo lecture.**

**Rate Tutor:- one can rate the tutor .**

**View Ebook:- Users can check the Ebooks.**

## **Functional Requirements**

**Functional requirements are product features or functions that developers must implement to enable users to accomplish their tasks.**

- 1. New Student/Teacher Registration-** Admin should be able to register and create new account of students and teachers.
- 2. User Login:-** Gives user authentication and should be taken to the next page.
- 3. Display Information:-** User should be able to see the tutors performance and their reviews of past few years. Teachers qualification and batch timings would be displayed. Students complete details shall be displayed including test performance and assignments.
- 4. Live Session:-** Live lectures shall be delivered by teachers for better interaction with the students.
- 5. Fee Payment:-** Enable the users to make the payment for various courses.
- 6. Student Progress Reports:-** Students weekly test reports shall be displayed and mailed to parents.
- 7. Logout;-** Open the drop-down menu.Select the sign out option.

## **Non-Functional Requirements**

**A non-functional requirements defines the quality attribute of a software system. They can be the necessities that specify the criteria that can be used to decide the operation instead of specific behaviors of the system.**

- 1. Fonts and attractiveness:-** An attractive home page with clear icon for user to navigate through various data like charts, bar, graphs and pie charts.
- 2. Help icon:-** A help option shall be available to help user get access to more detailed explanation and help user get information about the tuition finder platform.
- 3. Usability:-** Website should be easy to use, easy check our for etc.
- 4. Security:-** It is important while dealing with monetary transactions and user data.
- 5. Scalability:-** The website can grow and expand its functionality without affecting its performance.

## 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**

<b>Experiment No</b>	4
<b>Title of Experiment</b>	Prepare Project Plan based on scope, Calculate Project effort based on resources and Job roles and responsibilities
<b>Name of the candidate</b>	Shubhangi Srivastava
<b>Team Members</b>	Shantanu Sahay (RA2011028010078) Dhawal Gupta (RA2011028010081)
<b>Register Number</b>	RA2011028010078
<b>Date of Experiment</b>	06/04/2022

### Mark Split Up

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
<b>Total</b>		<b>10</b>	

**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:**

<b>Sl No</b>	<b>Register No</b>	<b>Name</b>	<b>Role</b>
<b>1</b>	RA2011028010076	Shubhangi Srivastava	Lead
<b>2</b>	RA2011028010078	Shantanu Sahay	Member
<b>3</b>	RA2011028010081	Dhawal Gupta	Member

## **Project Title:**

Online Private Tutor Finder

## 1. Project Management Plan

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

Focus Area	Details
Integration Management	<ul style="list-style-type: none"><li>• Governance Framework- All the decisions in the project shall be taken after a consideration of all parties involved and weighing all situations.</li><li>• Roles &amp; Responsibilities of Team -<ol style="list-style-type: none"><li>1. Shubhangi Srivastava- Lead, Frontend Developer</li><li>2. Shantanu Sahay- Member, Backend Developer.</li><li>3. Dhawal Gupta- Member, Resource Manager.</li></ol></li><li>• Change Management- If an instance arises where change is required, frontend resources shall be provided by all the team members to ease the process, and the backend shall be in a way that generalizes all the possibilities.</li><li>• Project Closure - The last phase shall comprise Testing and checking if the end product fully fills all the requirements.</li></ul>
Stakeholder	<ol style="list-style-type: none"><li>1. Shantanu Sahay (Owner, team member, Technical Lead)- Backend coding/Python/HTML/Web dev.</li><li>2. Shubhangi Srivastava (Owner, team member, Project manager)-Frontend/HTML/Figma.</li><li>3. Dhawal Gupta (Owner, team member, Resource manager)-Frontend/HTML/Figma.</li></ol>
Schedule Management	<p>Define Milestones:</p> <ol style="list-style-type: none"><li>1. Development phase: 12 days (May end)</li><li>2. Testing Phase: 1 Month (June 1st week)</li><li>3. Deployment: Mid-June.</li></ol>
Communication Management	All the important details and information shall be sent to the official group of the team for informing the urgency of the message.
Procurement Management	The team shall procure with the client for a period of 2 months to oversee bugs if any and help with help if needed.

## 2. Estimation

### 2.1. 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	1500
	E1R1A1T2	Implementing the backend.	12	6000
	E1R1A1T3	Implementing the front-end	7	3500
Identify Data Source for displaying units of Energy Consumption	E2R2A1T1	Go through Interface contract (Application Data Exchange) documents	5	2500
	E2R2A1T2	Document	3	1500

Effort (hr)	Cost (INR)
1	500

### 2.2. Infrastructure/Resource Cost [CapEx]

< OneTime Infra requirements >

Infrastructure Requirement	Qty	Cost per qty	Cost per item
Hosting Server	2	2.4k-3k/month	4.8k-6k/month
Cloud Storage	4	20k/month	80k/month
Hardware (PCs)	5	60k	3L

### 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	2,000,00	6,000,00
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
Shubhangi	Project Manager	Manage the project
Shantanu	Technical Lead	Design the end-to-end architecture
Dhawal	UX Designer	Design the user experience
Shubhangi	Frontend Developer	Develop user interface
Shantanu	Backend Developer	Design, Develop and Unit Test Services/API/DB
Dhawal	Cloud Operations	Provision required Services
Dhawal	Tester	Define Test Cases and Perform Testing

#### 3.2. Responsibility Assignment Matrix

RACI Matrix	Team Members			
Activity	Dhawal (Tester)	Shantanu (Developer)	Shubhangi (Project Manager)	(Key Business User)
User Requirement Documentation	I	C/I	R	A
FRONT END	I/R	C/I	A	I
BACK END	I	A	R	I
Testing	A	C	R	I
Deployment	C	R	A	C

A	Accountable
R	Responsible
C	Consult
I	Inform

#### Result:

Thus, the Project Plan was documented successfully.



## Department of Networking and Communications

**SRM IST, Kattankulathur – 603 203**

**Course Code: 18CSC206J**

**Course Name: Software Engineering and Project Management**

<b>Experiment No</b>	5
<b>Title of Experiment</b>	Prepare Work breakdown structure, Timeline chart, Risk identification table
<b>Name of the candidate</b>	Shubhangi Srivastava
<b>Team Members</b>	Shantanu Sahay (RA2011028010078) Dhawal Gupta (RA2011028010081)
<b>Register Number</b>	RA2011028010076
<b>Date of Experiment</b>	25/4/2022

### Mark Split Up

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
<b>Total</b>		<b>10</b>	

**Staff Signature with date**

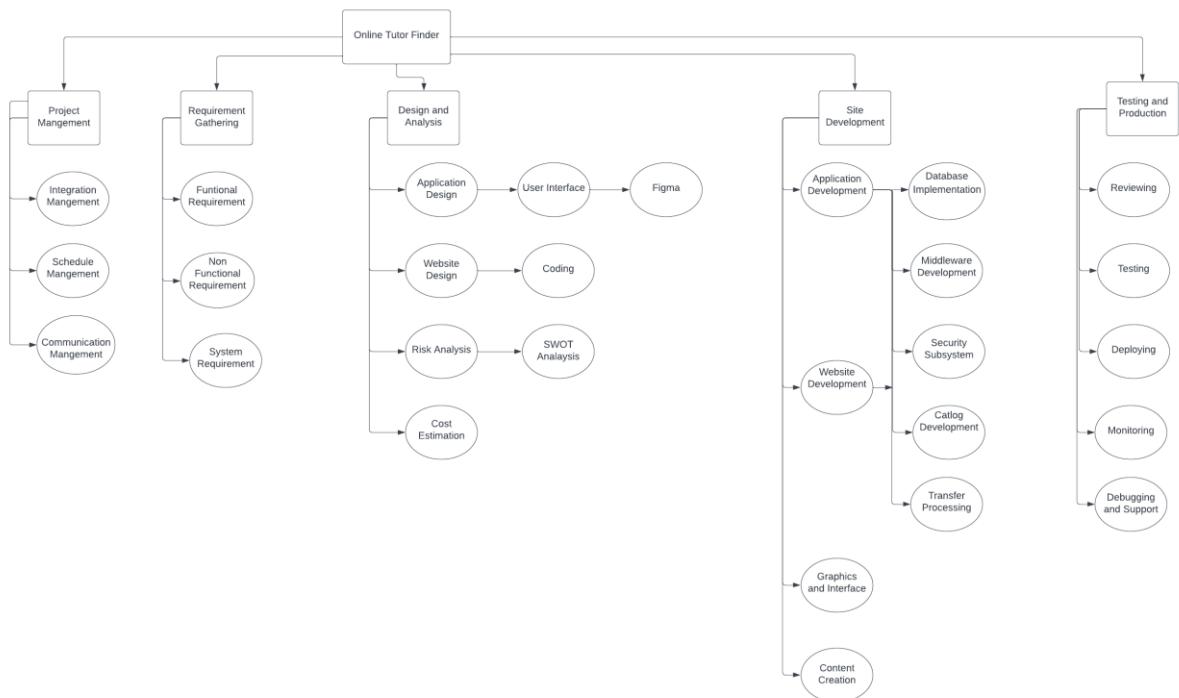
## Aim

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

## Team Members:

Sl No	Register No	Name	Role
1	Shubahngi Srivastava	RA2011028010076	Rep
2	Shantanu Sahay	RA2011028010078	Member
3	Dhawal Gupta	RA2011028010081	Member

## WBS – Examples



- 0.0 Online Tutor Finder
- 1.0 Project Management
  - 1.1 Integration Management
  - 1.2 Schedule Management
  - 1.3 Communication Management
- 2.0 Requirements Gathering
  - 2.1 Functional Requirement
  - 2.2 Non-Functional Requirement
  - 2.3 System Requirement
- 3.0 Analysis & Design
  - 3.1 Application Design
  - 3.2 Website Design

### 3.3 Risk Analysis

### 3.4 Cost Estimation

## 4.0 Site Software Development

- 4.1 HTML Design and Creation
- 4.2 Backend Software
  - 4.2.1 Database Implementation
  - 4.2.2 Middleware Development
  - 4.2.3 Security Subsystems
  - 4.2.4 Catalog Engine
  - 4.2.5 Transaction Processing
- 4.3 Graphics and Interface
- 4.4 Content Creation

## 5.0 Testing and Production

### 5.1 Reviewing

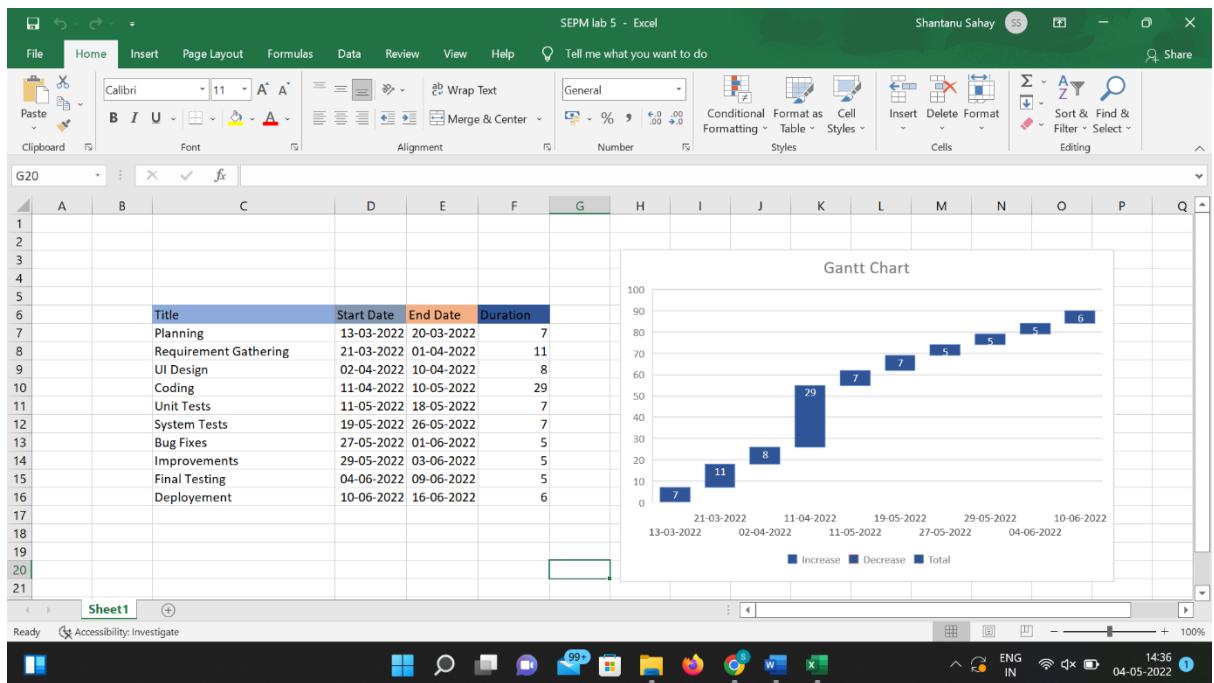
### 5.2 Testing

### 5.3 Deploying

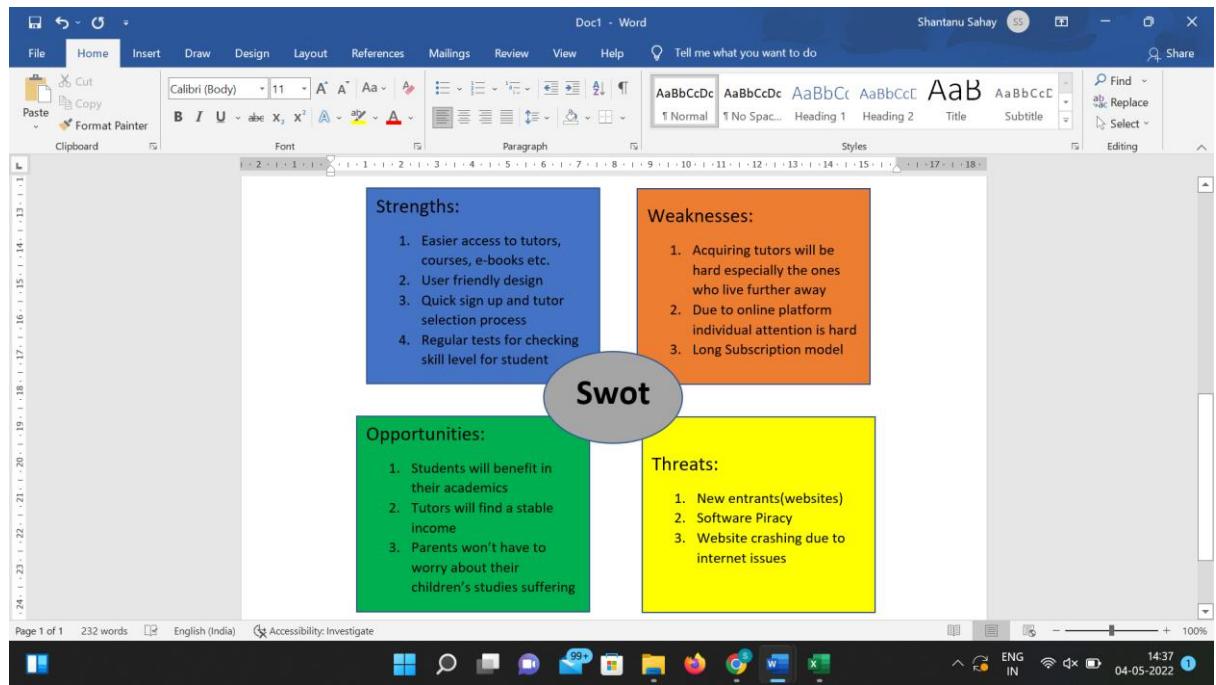
### 5.4 Monitoring

### 5.5 Debugging and Support

## **TIMELINE – GANTT CHART**



## RISK ANALYSIS – SWOT & RMMM



Response	Strategy	Example
Avoid	Risk avoidance is the elimination of hazards, activities and exposures that can negatively affect an organization and its assets.	<ul style="list-style-type: none"> <li>• Reviewing the schedule.</li> <li>• Check industry standards at every step.</li> <li>• Test the app on various hardware and check the output and smoothness</li> </ul>
Transfer	Risk transfer is a risk management and control strategy that involves the contractual shifting of a pure risk from one party to another.	Integration of security frameworks.
Mitigate	Risk mitigation is a strategy to prepare for and lessen the effects of threats faced by a business.	In the case of a Hacking breach, delete data.
Accept	Accepting risk or risk acceptance means that a business or an individual is ready to accept the identified risk.	Buying servers in advance for un forecasted events are not feasible for small-scale projects.

**Result:**

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



## Department of Networking and Communications

**SRM IST, Kattankulathur – 603 203**

**Course Code: 18CSC206J**

**Course Name: Software Engineering and Project Management**

<b>Experiment No</b>	6
<b>Title of Experiment</b>	Design a System Architecture, Use Case and Class Diagram
<b>Name of the candidate</b>	Shubhangi Srivastava
<b>Team Members</b>	Shantanu Sahay (RA2011028010078) Dhawal Gupta (RA2011028010081)
<b>Register Number</b>	RA2011028010076
<b>Date of Experiment</b>	11/5/22

### Mark Split Up

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
<b>Total</b>		<b>10</b>	

**Staff Signature with date**

## Aim

To Design a System Architecture, Use case and Class Diagram

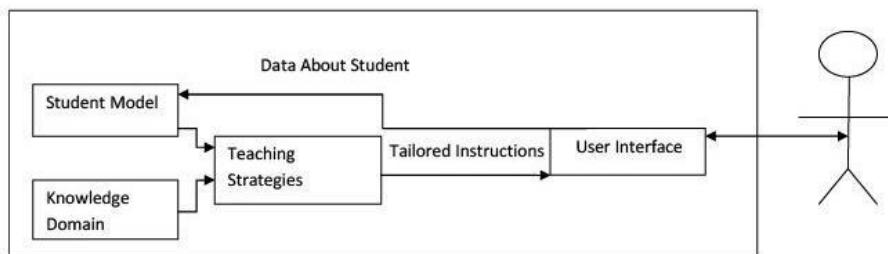
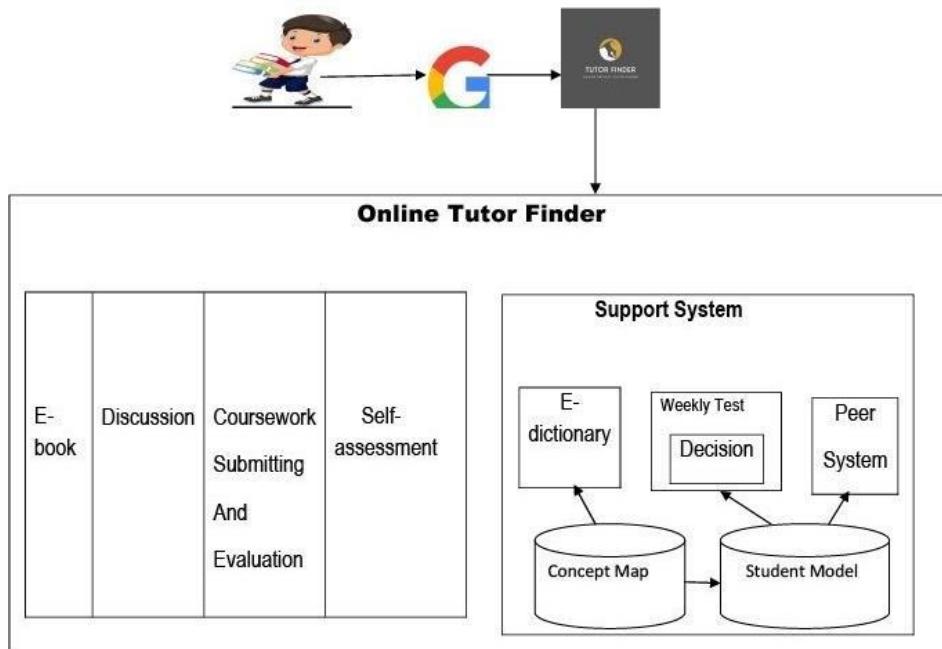
## Team Members:

Sl No	Register No	Name	Role
1	Shubhangi Srivastava	RA2011028010076	Rep
2	Shantanu Sahay	RA2011028010078	Member
3	Dhawal Gupta	RA2011028010081	Member

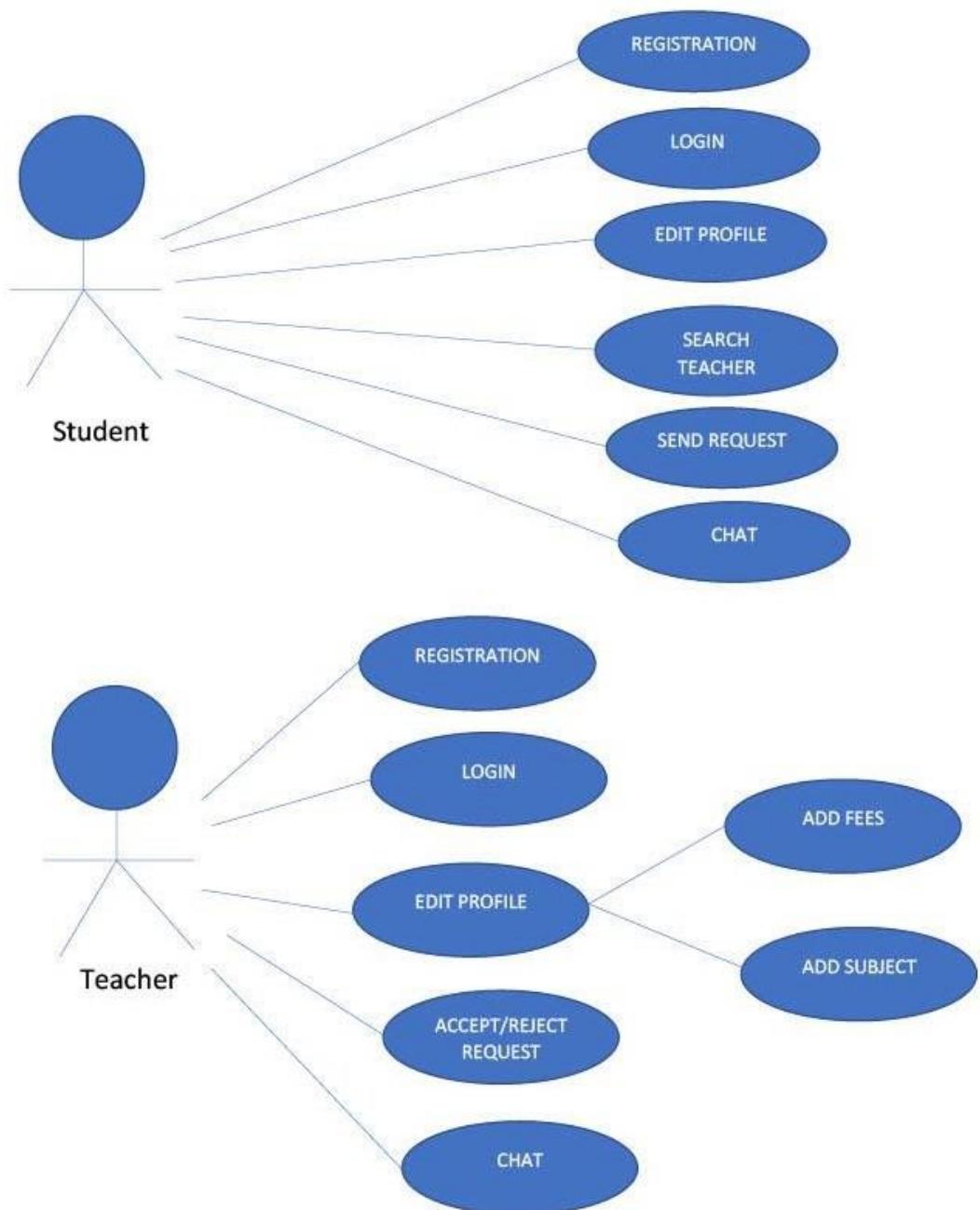
Requirements

<System Architecture, Use Case and Class Diagram>

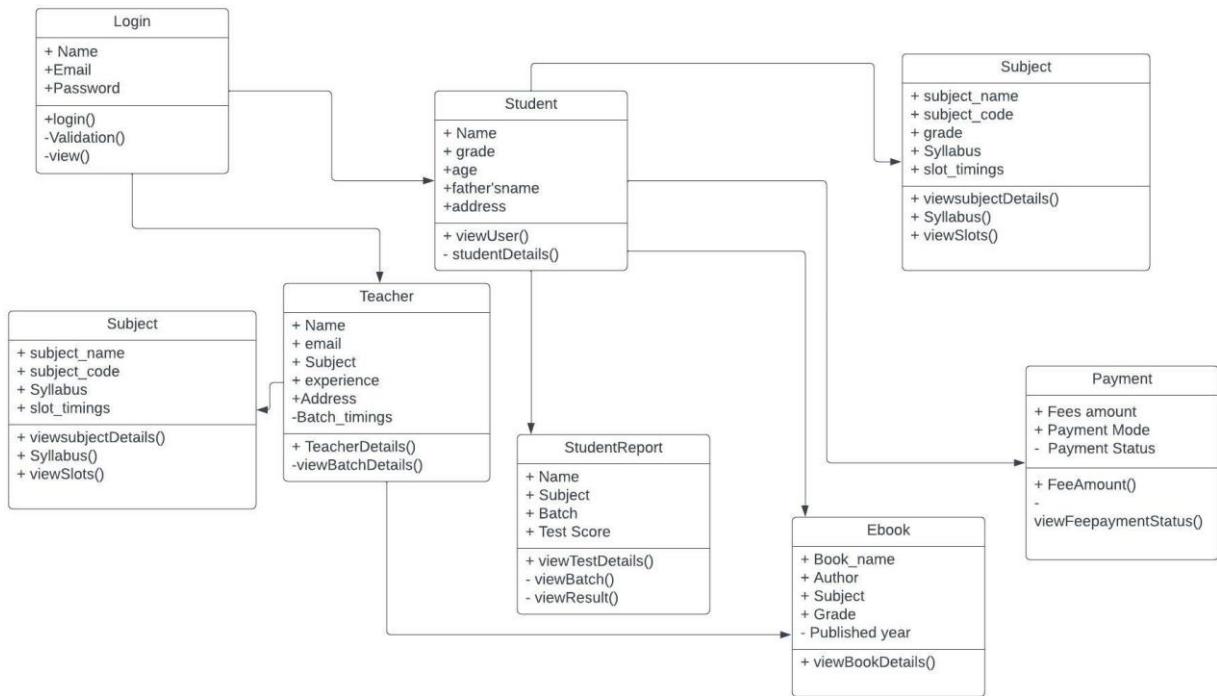
## SYSTEM ARCHITECTURE



## USE CASE DIAGRAM



## 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**

<b>Experiment No</b>	7
<b>Title of Experiment</b>	Design a Entity relationship diagram
<b>Name of the candidate</b>	Shubhangi Srivastava
<b>Team Members</b>	Shantanu Sahay (RA2011028010078) Dhawal Gupta (RA2011028010081)
<b>Register Number</b>	RA2011028010076
<b>Date of Experiment</b>	18/05/2022

### Mark Split Up

<b>S. No</b>	<b>Description</b>	<b>Maximum Mark</b>	<b>Mark Obtained</b>
1	Exercise	5	
2	Viva	5	
<b>Total</b>		<b>10</b>	

**Staff Signature with date**

## **Aim**

To create the Entity Relationship Diagram

### **Team Members:**

S No	Register No	Name	Role
1	Shubhangi Srivastava	RA2011028010076	Rep
2	Shantanu Sahay	RA2011028010078	Member
3	Dhawal Gupta	RA2011028010081	Member

### **Result:**

Thus, the entity relationship diagram was created successfully.



## \*/ ER Diagram, Notation and Example

### **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 well-designed 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 well-designed 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

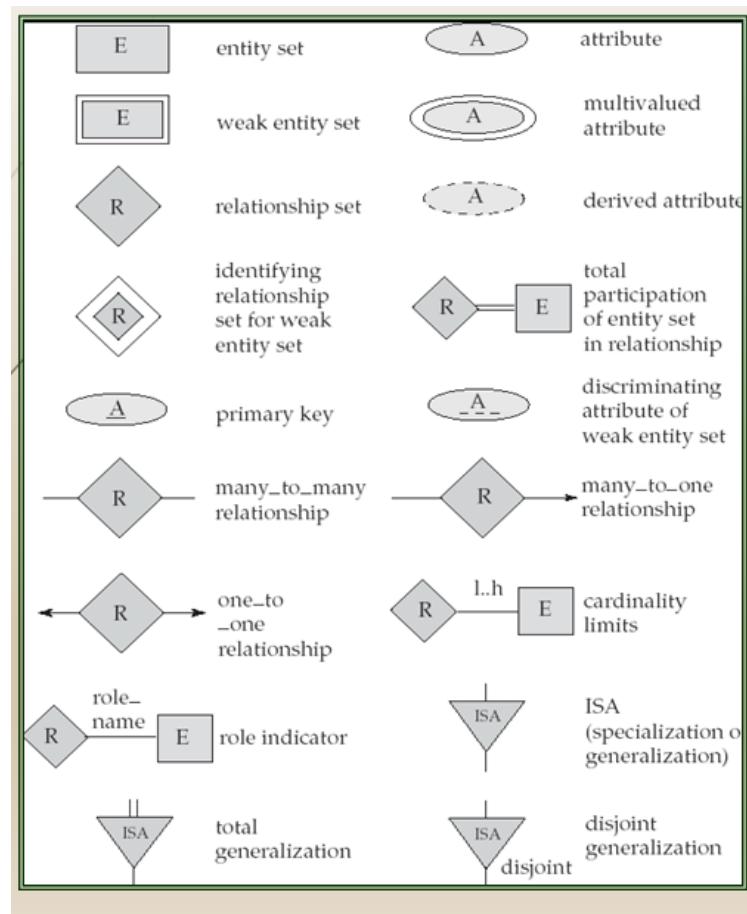
- Helps you to define terms related to entity relationship modeling
- Provide a preview of how all your tables should connect, what fields are going to be on each table
- Helps to describe entities, attributes, relationships
- ER diagrams are translatable into relational tables which allows you to build 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**

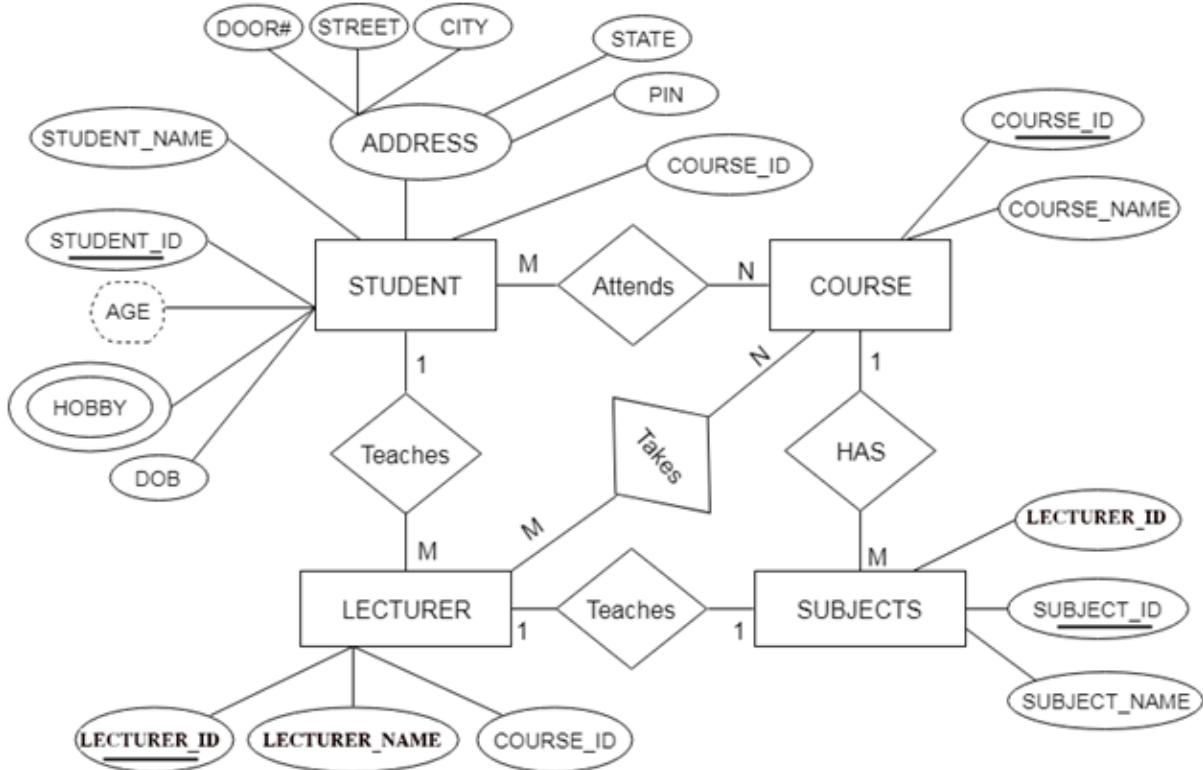
This model is based on three basic concepts: Entities, Attributes, Relationships

### **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.



## School of Computing

**SRM IST, Kattankulathur – 603 203**

**Course Code: 18CSC206J**

**Course Name: Software Engineering and Project Management**

<b>Experiment No</b>	8
<b>Title of Experiment</b>	Develop a Data Flow Diagram (Process-Up to Level 1)
<b>Name of the candidate</b>	Shubahngi Srivastava
<b>Team Members</b>	Shantanu Sahay (RA2011028010078)  Dhawal Gupta (RA2011028010081)
<b>Register Number</b>	RA2011028010076
<b>Date of Experiment</b>	25/05/22

### Mark Split Up

<b>S. No</b>	<b>Description</b>	<b>Maximum Mark</b>	<b>Mark Obtained</b>
1	Exercise	5	
2	Viva	5	
<b>Total</b>		<b>10</b>	

**Staff Signature with date**

## Aim

To develop the data flow diagram up to level 1 for the <project name>

## Team Members:

S No	Register No	Name	Role
1	Shubhangi Srivastava	RA2011028010076	Rep
2	Shantanu Sahay	RA2011028010078	Member
3	Dhawal Gupta	RA2011028010081	Member

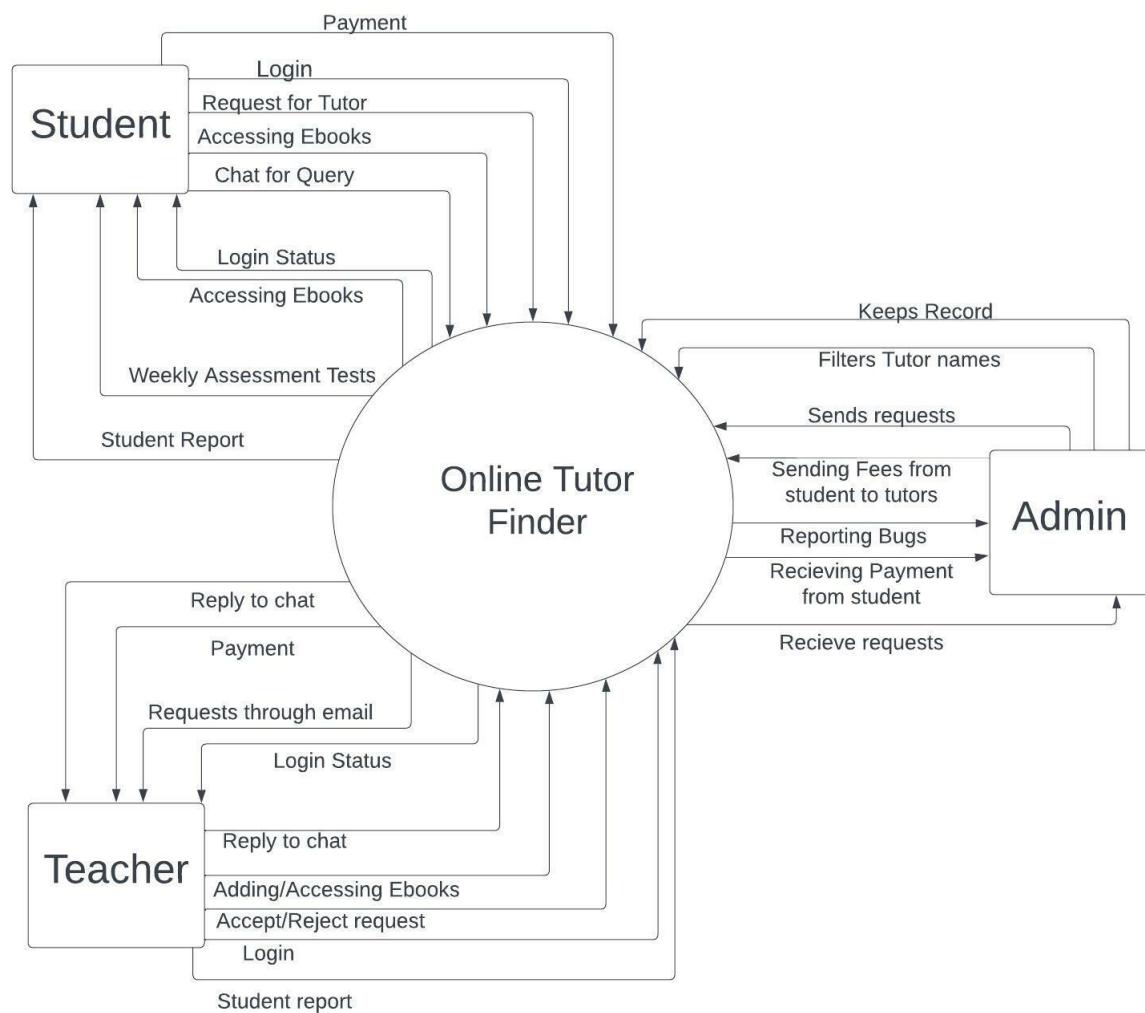
## Data Flow Diagram

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.

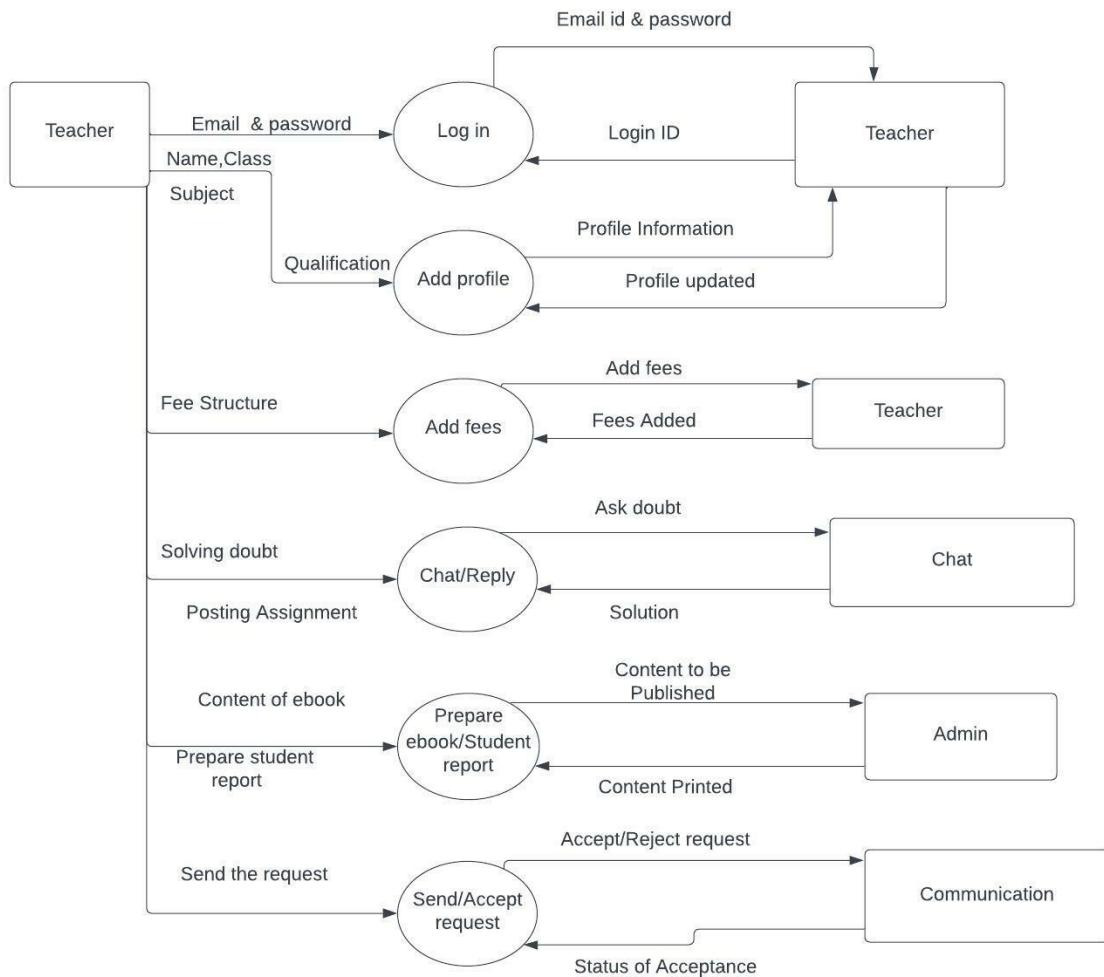
The data flow diagram enables you to develop models of the information domain and functional domain. As the DFD is refined into greater levels of detail, you perform an implicit functional decomposition of the system. At the same time, the DFD refinement results in a corresponding refinement of data as it moves through the processes that embody the application.

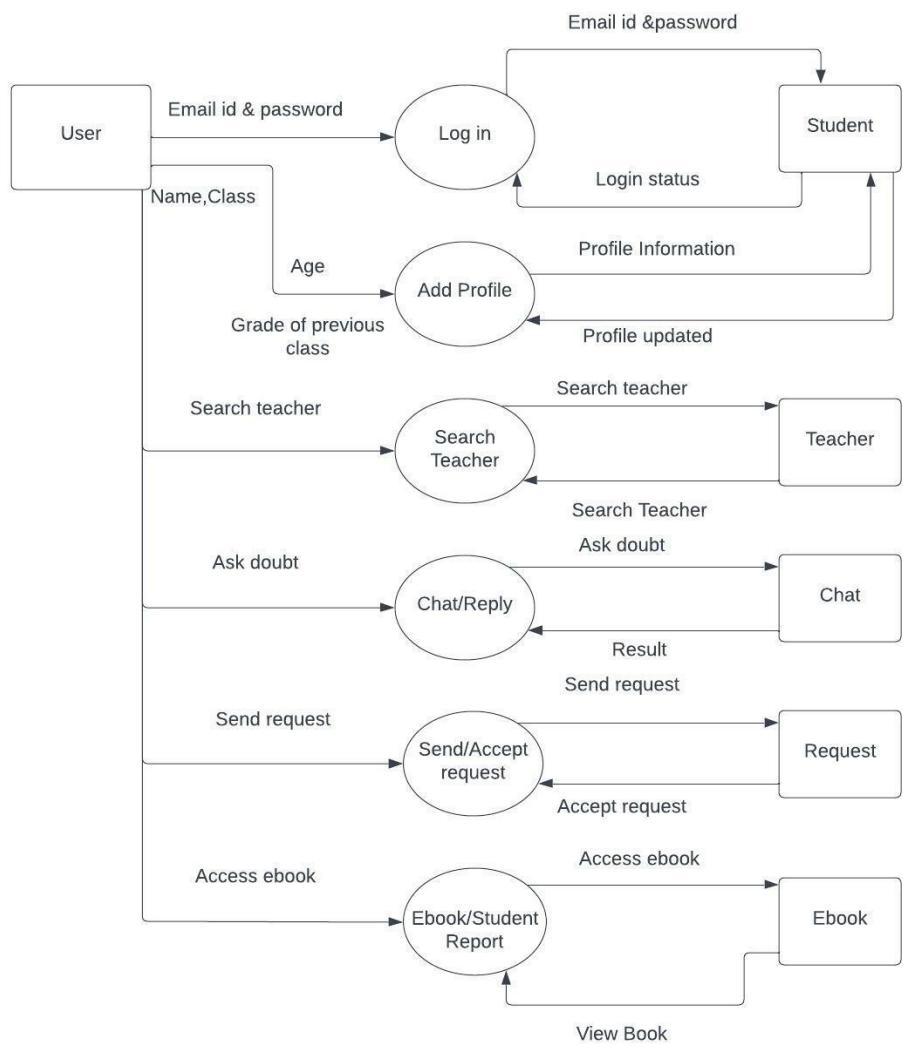
- A few simple guidelines can aid immeasurably during the derivation of a data flow diagram:
- (1) Level 0 data flow diagram should depict the software/system as a single bubble;
  - (2) Primary input and output should be carefully noted;
  - (3) Refinement should begin by isolating candidate processes, 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.

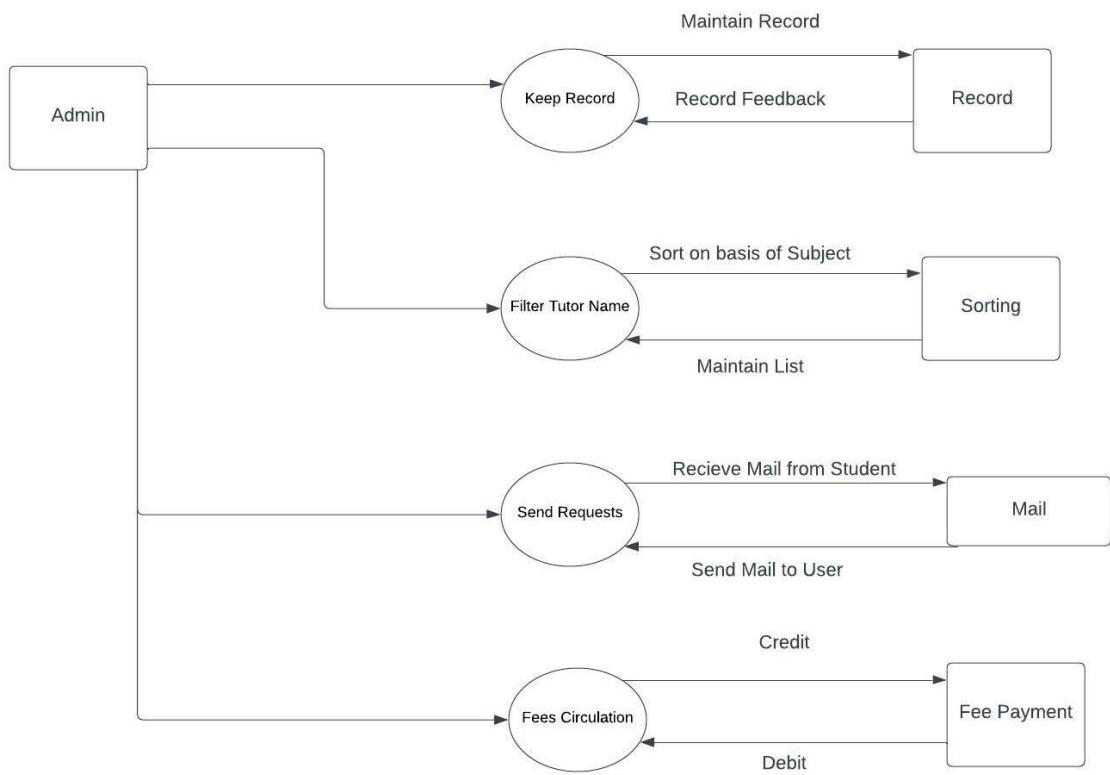
## DFD Level 0



## DFD Level 1







**Result:**

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



## School of Computing

**SRM IST, Kattankulathur – 603 203**

**Course Code: 18CSC206J**

**Course Name: Software Engineering and Project Management**

<b>Experiment No</b>	9
<b>Title of Experiment</b>	Design a Sequence and Collaboration Diagram
<b>Name of the candidate</b>	Shubhangi Srivastava
<b>Team Members</b>	Shantanu Sahay (RA2011028010078) Dhawal Gupta (RA20110280110081)
<b>Register Number</b>	RA2011028010076
<b>Date of Experiment</b>	

### Mark Split Up

<b>S. No</b>	<b>Description</b>	<b>Maximum Mark</b>	<b>Mark Obtained</b>
1	Exercise	5	
2	Viva	5	
<b>Total</b>		<b>10</b>	

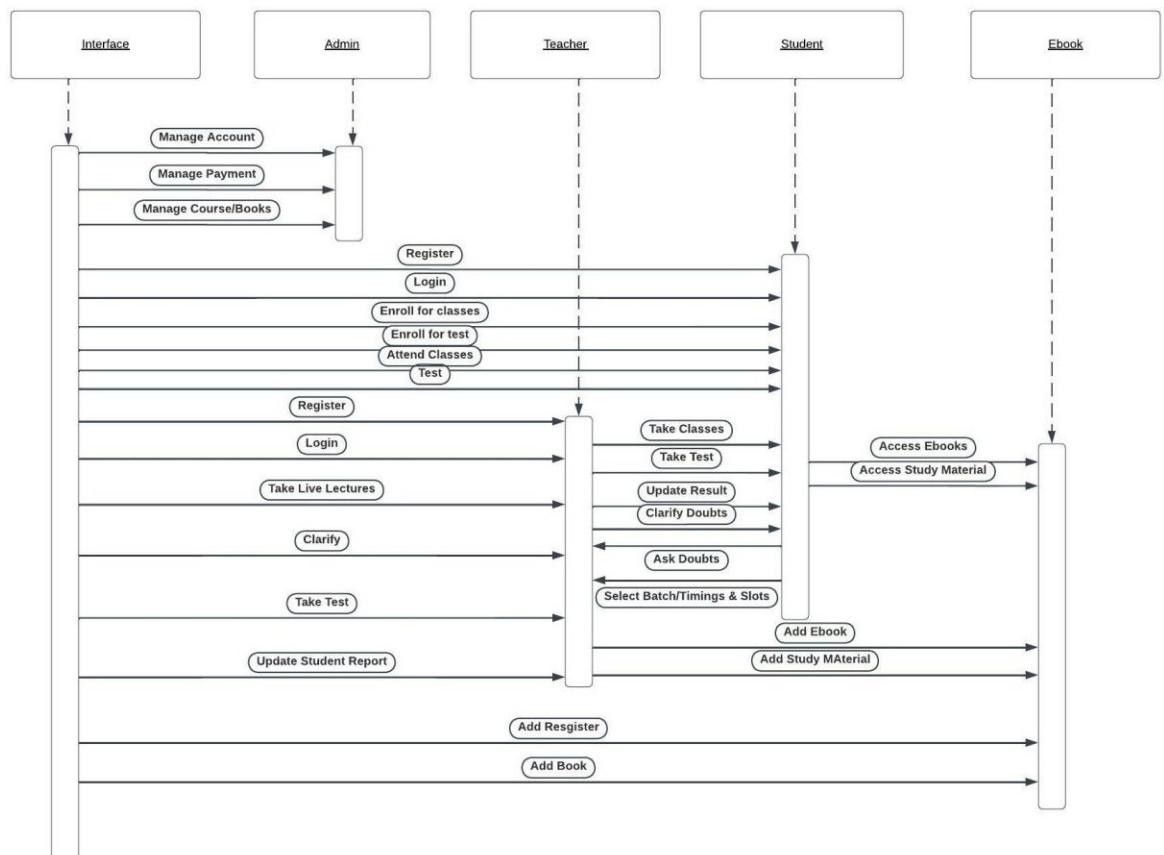
**Staff Signature with date**

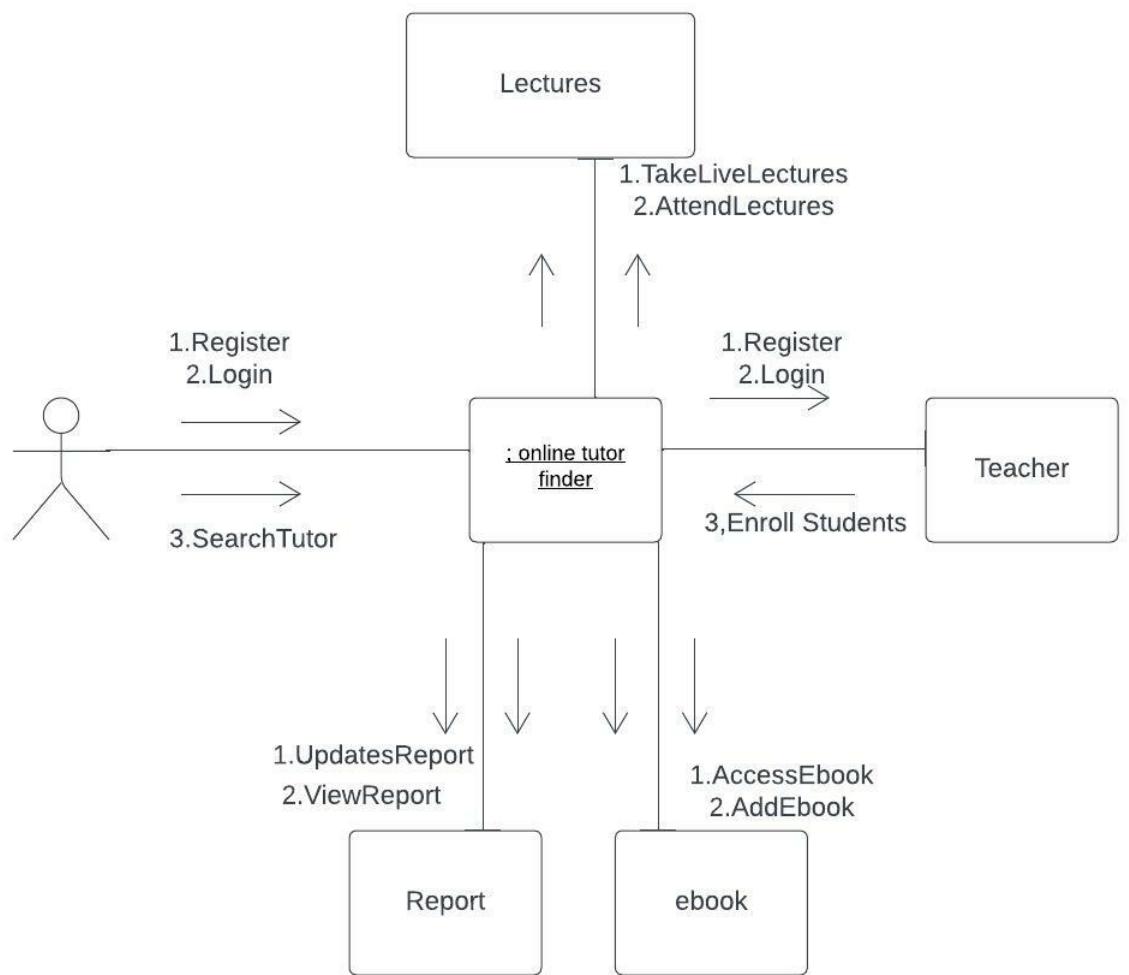
## Aim

To create the sequence and collaboration diagram for the Online Tutor Finder

### Team Members:

S No	Register No	Name	Role
1	RA2011028010076	<b>Shubhangi Srivastava</b>	<b>Rep/Member</b>
2	RA2011028010078	<b>Shantanu Sahay</b>	<b>Member</b>
3	RA2011028010081	<b>Dhawal Gupta</b>	<b>Member</b>





Result:

Thus, the sequence and collaboration diagrams were created for the Online Tutor Finder



## School of Computing

**SRM IST, Kattankulathur – 603 203**

**Course Code: 18CSC206J**

**Course Name: Software Engineering and Project Management**

<b>Experiment No</b>	10
<b>Title of Experiment</b>	Develop a Testing Framework/User Interface
<b>Name of the candidate</b>	Shubhangi Srivastava
<b>Team Members</b>	Shantanu Sahay (RA2011028010078)  Dhawal Gupta (RA2011028010081)
<b>Register Number</b>	RA2011028010076
<b>Date of Experiment</b>	

### Mark Split Up

<b>S. No</b>	<b>Description</b>	<b>Maximum Mark</b>	<b>Mark Obtained</b>
1	Exercise	5	
2	Viva	5	
	<b>Total</b>	<b>10</b>	

**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	RA2011028010076	<b>Shubahngi Srivastava</b>	<b>Rep/Member</b>
2	RA2011028010078	<b>Shantanu Sahay</b>	<b>Member</b>
3	RA2011028010081	<b>Dhawal Gupta</b>	<b>Member</b>

## Executive Summary

The scope for testing our Tutor Finder App is to conduct a comprehensive series of mostly automated tests, to ensure smooth flow of data and control amongst the numerous components. For each component, even prior to finishing development, tests are written to ensure they produce the results expected. As we're using the ReactJS, it ships right out of the box with all the tools required to set up a set of tests with ease, it even automatically completes the job of creating a dummy database so that the tests do not cause any undesirable change in the production database. We as a team have decided that the testing will follow a sequential approach, as it goes well with the RAD method of software development. We will 1st go through components, then test the archetype and then other minute details. After completing the functional testing, we will move on to the testing of NFR (Non-functional requirements)

## Scope of Testing

### Functional Testing:

**Testing is done on these 4 stages/steps-**

- **Unit testing-** Unit testing is the first level of testing and will be performed by the developers themselves. It is the process of ensuring individual components of a piece of software at the code level are functional and work as they were designed to.
- **Integration testing-** After each unit is thoroughly tested, it is integrated with other units to create modules or components that are designed to perform specific tasks or activities.
- **System testing-** System testing is a black box testing method used to evaluate the completed and integrated system, as a whole, to ensure it meets specified requirements
- **Acceptance testing-** Acceptance testing is the last phase of functional testing and is used to assess whether or not the final piece of software is ready for delivery.

### Non- Functional Testing:

- **Performance testing-** is a non-functional testing technique used to determine how an application will behave under various conditions.
- **Security testing -** With the presence of cloud-based testing platforms and cyber-attacks, there is a growing concern and need for the security of data being used and stored in software. Security testing is a non-functional software testing technique used to determine if the information and data in a system is protected.
- **Usability testing-** Usability testing is a testing method that measures an application's ease-of-use from the end-user perspective

and is often performed during the system or acceptance testing stages.

- **Compatibility testing-** Compatibility testing is used to gauge how an application or piece of software will work in different environments

## Types of Testing, Methodology, Tools

Category	Methodology	Tools Required
Functional Requirements	<ul style="list-style-type: none"><li>• Manual</li></ul>	<ul style="list-style-type: none"><li>• Acceptance Testing.</li><li>• White Box Testing.</li><li>• Black Box Testing.</li><li>• Unit Testing.</li><li>• System Testing.</li><li>• Integration Testing.</li></ul>
Non-functional Requirements	<ul style="list-style-type: none"><li>• Manual</li><li>• User/Crowd validation</li></ul>	<ul style="list-style-type: none"><li>• Performance Testing</li><li>• Security Testing</li><li>• Usability Testing</li><li>• Compatibility Testing</li></ul>

### Result:

Thus, the testing framework/user interface framework has been created for the Tutor Finder App.



## School of Computing

**SRM IST, Kattankulathur – 603 203**

**Course Code: 18CSC206J**

**Course Name: Software Engineering and Project Management**

<b>Experiment No</b>	11
<b>Title of Experiment</b>	Test Cases
<b>Name of the candidate</b>	Shubhangi Srivastava
<b>Team Members</b>	Shantanu Sahay (RA2011028010078)  Dhawal Gupta (RA2011028010081)
<b>Register Number</b>	RA2011028010076

### Mark Split Up

<b>S. No</b>	<b>Description</b>	<b>Maximum Mark</b>	<b>Mark Obtained</b>
1	Exercise	5	
2	Viva	5	
<b>Total</b>		<b>10</b>	

**Staff Signature with date**

## Aim

To develop the test cases manual for the Tutor Finder App

## Team Members:

S No	Register No	Name	Role
1	RA2011028010076	Shubhangi Srivastava	Rep
2	RA2011028010078	Shantanu Sahay	Member
3	RA2011028010081	Dhawal Gupta	Member

## Functional Test Case:

Test Id	Test Scenario	Test Case	Execution	Expected Outcome	Actual Outcome	Status	Remarks
LOGIN_1.1	Verify User Login	Enter valid username and password	1. User Goes to the site 2. User enters credentials for login 3. Clicks login Button	User Should be taken to the next page	User was taken to the next page	Pass	Success
LOGIN_1.2	Verify User Login	Enter valid username and invalid username	1. User Goes to the site 2. User enters	User Should be prompted with	User was prompted	Pass	Success

			credentials for login 3. Clicks login Button	Error			
<b>LOGIN_1.3</b>	Verify User Login	Enter invalid username and valid password	1. User Goes to the site 2. User enters credentials for login 3. Clicks login Button	User Should be prompted with Error	<b>User was prompted</b>	<b>Pass</b>	<b>Success</b>
<b>LOGIN_1.4</b>	Verify User Login	Enter invalid username and invalid password	1. User Goes to the site 2. User enters credentials for login 3. Clicks login Button	User Should be prompted with Error	<b>User was prompted</b>	<b>Pass</b>	<b>Success</b>
<b>SEARCH_2.1</b>	Search functionality	Tutor available according to need	1. User Goes to the site 2. Search a Tutor	User can ask for a free demo	<b>User was taken to the next page</b>	<b>Pass</b>	<b>Success</b>
<b>SEARCH_2.2</b>	Search functionality	Tutor not available according to need	1. User Goes to the site 2. Search a Tutor	It will show no Tutors available	<b>Showing the unavailability of Tutor</b>	<b>Pass</b>	<b>Success</b>

## Non-Functional Test Cases:

Test Id	Test Scenario	Test Case	Execution	Expected Outcome	Actual Outcome	Status	Remarks
<b>1</b>	Web Page Load Time	Measure the load times of page	1.Multiple pages are loaded in Expected Environment 2.Average Load Time is calculated	Average Load time is under 5 seconds	<b>Average Load time was 3 secs</b>	Pass	Success
<b>2</b>	Compatibility of Web Page	Check whether the site is working on all type of devices (eg: mobile laptop)	Using different devices to check the compatibility	Compatible enough to work on all screen ratios of user end device	<b>Adopting all screen ratios</b>	Pass	Success
<b>3</b>	Accessibility on the Web Page	All image should have all tags		Show text on the image or video if they are not working properly	<b>Showing Text on video and images</b>	Pass	Success

**Result:**

Thus, the test case manual has been created for the Project Tutor Finder App



## School of Computing

**SRM IST, Kattankulathur – 603 203**

**Course Code: 18CSC206J**

**Course Name: Software Engineering and Project Management**

<b>Experiment No</b>	12
<b>Title of Experiment</b>	Manual Test Case Reporting
<b>Name of the candidate</b>	Shubhangi Srivastava
<b>Team Members</b>	Dhawal Gupta, Shantanu Sahay
<b>Register Number</b>	RA2011028010076
<b>Date of Experiment</b>	15-06-2022

### Mark Split Up

<b>S. No</b>	<b>Description</b>	<b>Maximum Mark</b>	<b>Mark Obtained</b>
1	Exercise	5	
2	Viva	5	
<b>Total</b>		<b>10</b>	

**Staff Signature with date**

## Aim

To prepare the manual test case report for the Online Tutor Finder

### Team Members:

S No	Register No	Name	Role
1	RA2011028010076	Shubhangi Srivastava	Rep/Member
2	RA2011028010078	Shantanu Sahay	Member
3	RA2011028010081	Dhawal Gupta	Member

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

Functional	Test Case Coverage (%)	Status
LOGIN_1.1	100%	COMPLETED
LOGIN_1.2	50%	IN PROGRESS
LOGIN_1.3	50%	IN PROGRESS
LOGIN_1.4	0%	NOT STARTED
SEARCH_2.1	100%	COMPLETED
SEARCH_2.2	0%	NOT STARTED

<b>Non-Functional</b>	<b>Test Case Coverage (%)</b>	<b>Status</b>
Web Page Load Time	100%	COMPLETED
Compatibility of Web Page	50%	IN PROGRESS
Accessibility on the Web Page	100%	COMPLETED

Result:

Thus, the test case report has been created for the Online Tutor Finder.