

## **LAB REPORT**

*Submitted by*

**VaranasiGurucharan[RA2111030010075]**

*Under the Guidance of*

**Dr. Gouthaman. P**

**Assistant Professor, Department of Networking and Communications**

*In partial satisfaction of the requirements for the degree of*

**BACHELOR OF TECHNOLOGY**

**in**

**COMPUTER SCIENCE AND ENGINEERING**

**with specialization in CYBERSECURITY**



**SCHOOL OF COMPUTING**

**COLLEGE OF ENGINEERING AND  
TECHNOLOGY SRM INSTITUTE OF SCIENCE  
AND TECHNOLOGY KATTANKULATHUR - 603203**

**MAY 2023**



COLLEGE OF ENGINEERING & TECHNOLOGY  
SRM INSTITUTE OF SCIENCE & TECHNOLOGY  
S.R.M. NAGAR, KATTANKULATHUR - 603 203  
Chengalpattu District

## BONAFIDE CERTIFICATE

Register No. RA2111030010075 Certified to be the  
bonafide work done by Varanasi Gurucharan of II Year/IV Sem B.Tech  
Degree Course in the Practical Course – 18CSC206J - Software Engineering  
and Project Management in SRM INSTITUTE OF SCIENCE AND  
TECHNOLOGY, Kattankulathur during the academic year 2022 – 2023.



A handwritten signature in blue ink, which appears to read "Dr. Gouthaman P." followed by a date "15/02/2023".

A handwritten signature in red ink, which appears to read "Dr. Gouthaman P." followed by "SIGNATURE 15/02/2023".

Faculty In-Charge  
**Dr. Gouthaman P.**  
Assistant Professor  
Department of Networking and Communications SRM Institute of Science and Technology

### SIGNATURE

**HEAD OF THE DEPARTMENT**  
**Dr. Annapurani Panaiyappan. K**  
Professor and Head,  
Department of Networking and Communications SRM Institute of Science and Technology

**ABSTRACT:**

A biometric attendance system is an automated system that facilitates the tracking and monitoring of attendance and work hours of employees or students. The system uses biometric technology, such as fingerprint or facial recognition, to accurately and efficiently collect attendance information. The aim of this paper is to provide an overview of the biometric attendance system, including its benefits, challenges, underlying technologies, and potential applications. The paper discusses how this technology can improve attendance management, reduce time fraud, increase efficiency, and enhance the security of the workplace or educational institution. Overall, biometric attendance systems offer a practical solution for attendance management, especially in situations where traditional attendance methods are prone to errors and manipulation.

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## **LIST OF ABBREVIATIONS**

**API**-Application Programming Interface

**UX**-User Experience

**OWASP ZAP**-Open Web Application Security Zed Attack Proxy

**WBS**-Work Breakdown Structure

**SWOT**-Strengths, Weaknesses, Opportunities, and Threats

**RMMM**-Risk Mitigation, Monitoring, and Management



## School of Computing

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	1
Title of Experiment	To identify the Software Project, Create Business Case, Arrive at a Problem Statement
Name of the candidate	V. Guru Charan
Team Members	K.Goutham Reddy , D. Venkat Kishore
Register Number	RA2111030010075
Date of Experiment	27-01-2023

### Mark Split Up

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



**P. Goutham**  
Staff Signature with date

### Aim

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

S. No	Register No	Name	Role
1	RA2111030010090	D. Venkat Kishore	Lead/Rep
2	RA2111030010075	V. Guru Charan	Member
3	RA2111030010072	K. Goutham	Member

### Project Title: Biometric Attendance system

#### Project Description

A biometric attendance system consists of a biometric device which captures the daily attendance of employees by scanning their fingerprints. The scanned fingerprint is mapped out on the basis of various coordinates defined within the software, which then accurately identifies the fingerprint. It keeps a track of the check in and check out timing of both students and teachers in the premises .

# ONE PAGE BUSINESS CASE TEMPLATE

Date	27-01-2023
Submitted By	D. Venkat kishore
Title/Role	<b>Biometric Attendance system</b>

## PROJECT : **Biometric Attendance system**

A biometric attendance system consists of a biometric device which captures the daily attendance of employees by scanning their fingerprints. The scanned fingerprint is mapped out on the basis of various coordinates defined within the software, which then accurately identifies the fingerprint. It keeps a track of the check in and check out timing of both students and teachers in the premises.

Biometric systems have been in use to control the physical accesses of the buildings. The main use of this system was to **prevent any risk of fraudulent activities**, thereby offering a safe and secure environment .The key focus to implement a biometric attendance system is to provide **access only to authorized people** and safeguard their assets, meanwhile tracking and monitoring their presence in the institute. Apart from access control, it enables keeping a **track of employee attendance** and their work hours. It can further be used to track the check in and check out timing of students in an educational institute, further ensuring a smooth and simplified attendance process.

## THE HISTORY

In the 19th century, a Scientist named **Alphonse Bertillion** discovered a system, i.e., measurements of the body of a person to identify them. It took the subject's photograph and recorded height, the length of one foot, an arm, and index finger. He had acknowledged that some traits of the human body such as the length of the fingers remain unchanged concerning other physical characteristics such as length of hair, weight, etc., gets altered. This method disapproved quickly as the persons with same body measurements would be falsely taken as one. Hence, with the help of this research, a Scotland based scientist Richard Edward Henry discovered a new method of fingerprinting.

The notion of retinal identification was first introduced by **Dr. Carleton Simon and Dr. Isadore Goldstein** in 1935. First face recognition paper was published in 1971 (Goldstein et al.). The research and development effort was put in at Eye Identify Inc in 1976. The first commercial retina scanning system was developed in 1981. **John Daugman** introduced the early successful Iris recognition in 1993 at Cambridge University. FBI installed IAFIS in 2000 with a database of about 47 million prints; average of 50,000 searches per day; 15% of searches are in lights out mode and 2 hour response time for the criminal search. **Biometrics Automated Toolset (BAT)** was introduced in 2001, which provided an accurate identification technique. Thus, at present biometrics has developed a concrete ground of study with precise technologies of identifying personality traits.

Thus, at present biometrics has developed a concrete ground of study with precise technologies of identifying personality traits.

## LIMITAIONS:

Most common biometric authentication methods rely on partial information to **False positives and inaccuracy** authenticate a user's identity. For example, a mobile biometric device will scan an entire fingerprint during the enrolment phase, and convert it into data. However, future biometric authentication of the fingerprint will only use parts of the prints to verify identity so it's faster and quicker. In 2018, a research team from New York University created an Artificial Intelligence platform that was able to fraudulently crack fingerprint authentication at a success rate of 20% by matching similarities of partial prints to the full biometric data

## **APPROACH**

- 1.Secure Cloud- Based Platform:The student biometric attendance system offers a highly secured centralized time attendance data collection system for achieving the best practices in educational institutions.
- 2.Payroll System Integration: biometric fingerprint attendance system can be integrated into the payroll system for managing monthly payments of staff & faculty in the educational institution with a few clicks.
- 3.24\*7 Accessibility:Designed & developed with advanced security measures & role-based access provision, the biometric attendance system allows faculty to analyze attendance details at any time & from anywhere.
- 4 .Precise MIS Attendance Reports:The biometric attendance software auto-generates daily/weekly/monthly/yearly MIS attendance reports of students to ensure real-time & accurate time-attendance tracking & management.
- 5.Easy & Simple Navigation: biometric attendance system is extremely user-friendly & simple-to-use attendance software built to ensure hassle-free navigation to the end-users.
- 6 .Real-Time Attendance Alerts:The ERP software auto-sends SMS and Email alerts to teachers & parents about ward's absentee in real-time to maintain the best security practices.

## **BENEFITS**

High security and assurance – Biometric identification provides the answers to "something a person has and is" and helps verify identity

- 1 User Experience – Convenient and fast
- 2 Non-transferrable – Everyone has access to a unique set of biometrics
- 3 Spoof-proof – Biometrics are hard to fake or steal
- 4 High security and assurance

Biometrics provide increased levels of assurance to providers that a person is real by verifying a tangible, real-world trait as both something the user has and something the user is. Most user's passwords and PINs and personal identifying information have likely been compromised with a data breach, meaning, billions of accounts can be accessed by fraudsters who retain the answers to traditional authentication methods.

Introducing biometric authentication into the process adds in a roadblock for fraudsters that only a real, authorized user can circumnavigate - though a fraudster may know a person uses their dog's name and some lucky numbers for most of their online accounts, they can't use their fingerprint to unlock an account if they can't provide it on the spot. Additionally, biometric security can only be provided by living, breathing people - at this point in time, a robot would have a hard-time passing an iris scan.

#### User experience is convenient and fast

While the internal process for biometric authentication is technical, from a user's point of view it's incredibly easy and quick. Placing a finger on a scanner and unlocking an account in seconds is faster than typing out a long password that has multiple special characters. In addition, forgetting a password is a common mistake of most users. The chances of you forgetting your own biometrics? Never!

#### Non-transferable

Biometric authentication requires its input is present upon authorization. You can't transfer or share a physical biometric digitally – the only way to utilize most biometric authentication systems is with a physical application.

#### Near spoof-proof

Biometrics like face patterns, fingerprints, iris scanning, and others are near-impossible to replicate with current technology. There's a one in 64 billion chance that your fingerprint will match up exactly with someone else's[1]. Said a different way, you have a better chance winning the lottery than having the same fingerprint as a hacker trying to get into your account that's secured by biometrics.

#### Result:

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



## School of Computing

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	2
Title of Experiment	and Stakeholder Identification of Process Methodology Description
Name of the candidate	V. Guru Charan
Team Members	D. Venkat Kishore , K. Goutham reddy
Register Number	RA2111030010075
Date of Experiment	31-01-2023

### Mark Split Up

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	5
2	Viva	5	4
Total		10	9

Staff Signature-with date

Aim

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## Aim

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

## Team Members:

SI No	Register No	Name	Role
1	RA2111030010090	D.venkat kishore	Rep/Member
2	RA2111030010075	V.Gurucharan	Member
3	RA2111030010075	K.Goutham reddy	Member

## Project Title:

### Selection of Methodology :Agile Methodology

- Biometric attendance systems often have rapidly changing requirements and client needs. Agile methodology allows for flexible and iterative development.
- Prioritizes delivering working software to clients as quickly as possible and regularly gathering information and needs from them to refine the product.
- Focuses on delivering working software incrementally, rather than waiting for a full release.
- Includes regular testing and information which helps to ensure that the Biometric attendance system is of high accuracy and meets clients needs.
- Focuses on delivering working software incrementally, rather than waiting for a full release.

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	Developing a business plan and raising capital	high	high	high
client	placing orders and give feedback	high	low	high
executive manager	Delivering product to customers	high	high	high
investors	Investors who provide capital to support the growth	high	high	medium
suppliers	provide materials, services,or equipment required by the project	high	low	high
employee	Managing ordering and customer experience	high	low	medium
advertising companies	Companies that promote to the customers	low	low	low

Result :

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



### School of Computing

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	varanasi guru charan
Team Members	D.venkat kishore kami goutham reddy
Register Number	RA2111030010090 RA2111030010075 RA2111030010072
Date of Experiment	07-02-23

### Mark Split Up

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	5
2	Viva	5	3

Total	10	8
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P.Goutham 24/2/2022  
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	RA2111030010090	D.venkat kishore	Rep/Member
2	RA2111030010075	varanasi guru charan	Member
3	RA2111030010072	kami goutham reddy	Member

### Project Title: < >bio metric attendance system

#### System Requirements

Hardware requirements: The system should have high performance centrimodule , fingerprint sensor of high accuracy , microcontrollers , modules (standalone module for fingerprint recognition systems).

Software requirements: the system should be built on cloud platform by using python as the programming language for the platform. The should able to run windows 7.

Network requirements : The system should be connected to the internet with a fast and reliable connection.

Client requirements: The system should be accessible to clients through a portal in computer.

**Security requirements:** The system should contain the security measures for proxy ARP , the cloud platform should not be effected by SQL injection, the portal should be running on HSTS only .platform should be resistant to attacks like brute force etc.

**Performance requirements :** The system should be able to hand large amounts of traffic with minimal down time

**RELIABILITY REQUIREMENTS:** The system should be highly available andprovide seamless performance, even during high-traffic periods.

**MAINTENANCE REQUIREMENTS:** The system should be easy to maintain andupgrade, with clear documentation and support for system administrators.

**COMPATIBILITY REQUIREMENTS:** The system should be compatible withdifferent operating systems, web browsers, and devices.

**TECHNICAL SUPPORT REQUIREMENTS:** The system should have a reliablesupport system in place, including a help desk, online documentation, and knowledge base.

## **Functional Requirements:**

The functional criteria of an attendance management system often include the following:

1. These reports should be completely customizable, allowing you to filter by employee or student, date period, and other criteria.
2. It should also contain roles and permissions that regulate who has access to, modifies, or deletes attendance data.
3. Managers or administrators should be allowed to approve or reject leave requests as well.

4. **Scheduling:** The system should allow managers or administrators to plan shifts or courses, as well as alert employees or students of their future schedules.
5. **Time and attendance reporting:** The system should generate attendance data such as attendance records, attendance percentages, and tardiness statistics.
6. **Mobile access:** The system should be accessible through mobile devices such as smartphones or tablets, enabling employees or students to remotely check their attendance or request time off.
7. **Data backup and recovery:** A solid data backup and recovery solution should be included in the system to ensure that attendance data is not lost in the event of a system failure.
8. **Attendance tracking:** The system should be able to track attendance for both individual employees or students as well as groups or courses.
9. This might involve writing down the dates and hours of arrival and departure, as well as the duration of stay.
10. **Payroll integration:** The system should be able to connect to payroll systems in order to calculate and monitor employee or student pay based on attendance data automatically.
11. **Access control:** The system should include a secure login mechanism to ensure that only authorised users may access attendance data.
12. Employees or students should be able to use the system to request and track leave, such as vacation or sick time.

### **Non-Functional Requirements:**

Non-functional requirements specify how a system should behave or function rather than what it should achieve. They describe the overall characteristics and limitations of a system, such as performance, reliability, security, usability, and maintainability.

1. **Usability:** The system should be simple to use and understand, with a basic interface.
2. **Maintainability:** The system should be easy to maintain and update, enabling you to add new features or fix problems without disturbing the system.
3. **Accessibility:** The system should be accessible to all employees, regardless of physical location or device.
4. **Performance:** The system should be able to process a large number of employees' attendance data in a timely and error-free way.

5. Scalability refers to the system's capacity to accept an increasing number of employees or attendance records without deteriorating performance.
6. Compatibility: The system should be compatible with other systems or tools used by the company, such as payroll or human resources.
7. Reliability: The system should be reliable and capable of working without defects or malfunctions even when exposed to heavy usage or unexpected circumstances.
8. Security: The system should be protected against unauthorised access and modification of attendance data.
9. Integration entails the system's ability to interact with other systems or tools, such as time management or scheduling software.

## Result

Thus the requirements were identified and accordingly described.



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**School of Computing**

**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>	Varanasi Gurucharan
<b>Team Members</b>	D. venkat Kishore K.Goutham
<b>Register Number</b>	RA2111030010075
<b>Date of Experiment</b>	14-02-2023

**Mark Split Up**

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	4
2	Viva	5	4
<b>Total</b>		<b>10</b>	<b>8</b>

P. Gurucharan 21/2/2023  
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	RA2111030010090	D. venkat Kishore	Lead
2	RA2111030010075	V.Gurucharan	Member
3	RA2111030010072	K.Goutham	Member

## PROJECT MANAGEMENT PLAN :-

### 1. Estimation

#### 1.1. Effort and Cost Estimation

Activity Description	Sub-Task	Sub-Task Description	Effort (in hours)	Cost in US Dollars(\$)
Planning and Analyzing	Organizing	Go through the data collected ,and what will be used for, analyzed	160	\$1200
Creating Design	Developing the software	The process of envisioning and defining software solutions to one or more sets of problems	2300	\$8000
Testing	Executing, Handling the errors	Implementing the software according to the clients wish	100	\$2000
Deployment	Final product presentation, Risk Management	showing the final outcome and getting feedback	50	\$900

## 1.2. Infrastructure/Resource Cost [CapEx]

Infrastructure Requirement	Qty	Cost Per qty	cost per item
Hardware	130	\$210	\$27300
Storage	20	\$1800	\$36000
Software License	1	\$10000	\$10000
Total	-	-	\$73300

## 1.3 Maintenance and Support Cost [OpEx]

Category	Details	Qty	Cost per qty per annum	Cost per item
Infrastructure Maintenance	Network, System, Middleware and DB admin Developer , Support Consultant	1	\$10000	\$10000
Server Maintenance	Operating System Database Middleware	4	\$5000	\$20000
Database Maintenance	Server, Storage	4	-	-

## 2. Project Team Formation

### 2.1. Identification Team members

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

### 2.2. Responsibility Assignment Matrix

RACIMatrix		TeamMembers		
Activity	Business Analyst	Developer	Project Manager	Key Business user

User Requirement Documentation	A	C/I	I	R
Testing	C	R	I	C
Work Presentation	I	A/R	A/R	C
Team Meeting	C	R	A/R	I
Maintenance & Support	C	R	A	C/I

A	Accountable
R	Responsible
C	Consult
I	Inform

Result:

Thus, the Project Plan was documented successfully.



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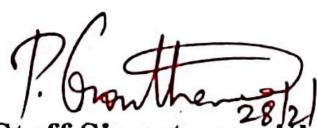
**Course Code: 18CSC206J**

**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>	Varanasi Gurucharan
<b>Team Members</b>	D.venakat Kishore , K.Goutham
<b>Register Number</b>	RA2111030010075
<b>Date of Experiment</b>	27-02-2023

### Mark Split Up

<b>S.No</b>	<b>Description</b>	<b>Maximum Mark</b>	<b>Mark Obtained</b>
1	Exercise	5	5
2	Viva	5	4
	<b>Total</b>	<b>10</b>	<b>9</b>

  
P. Gurucharan  
28/2/2023  
**Staff Signature with date**

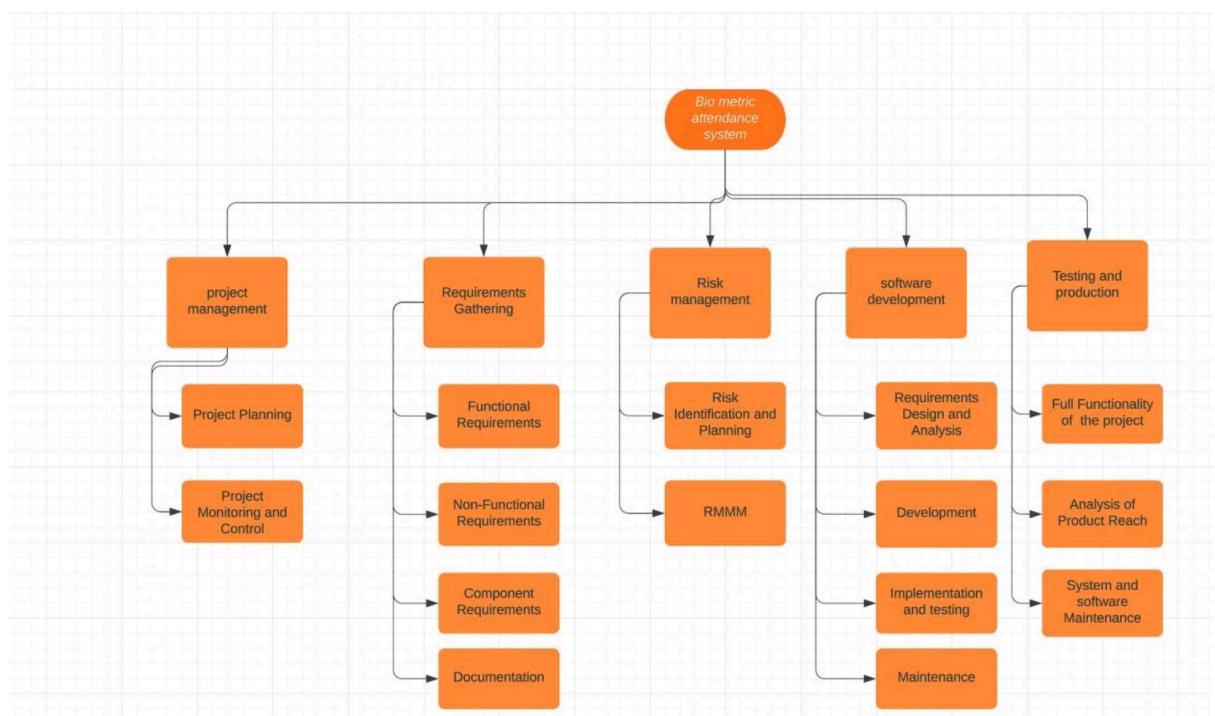
## Aim

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

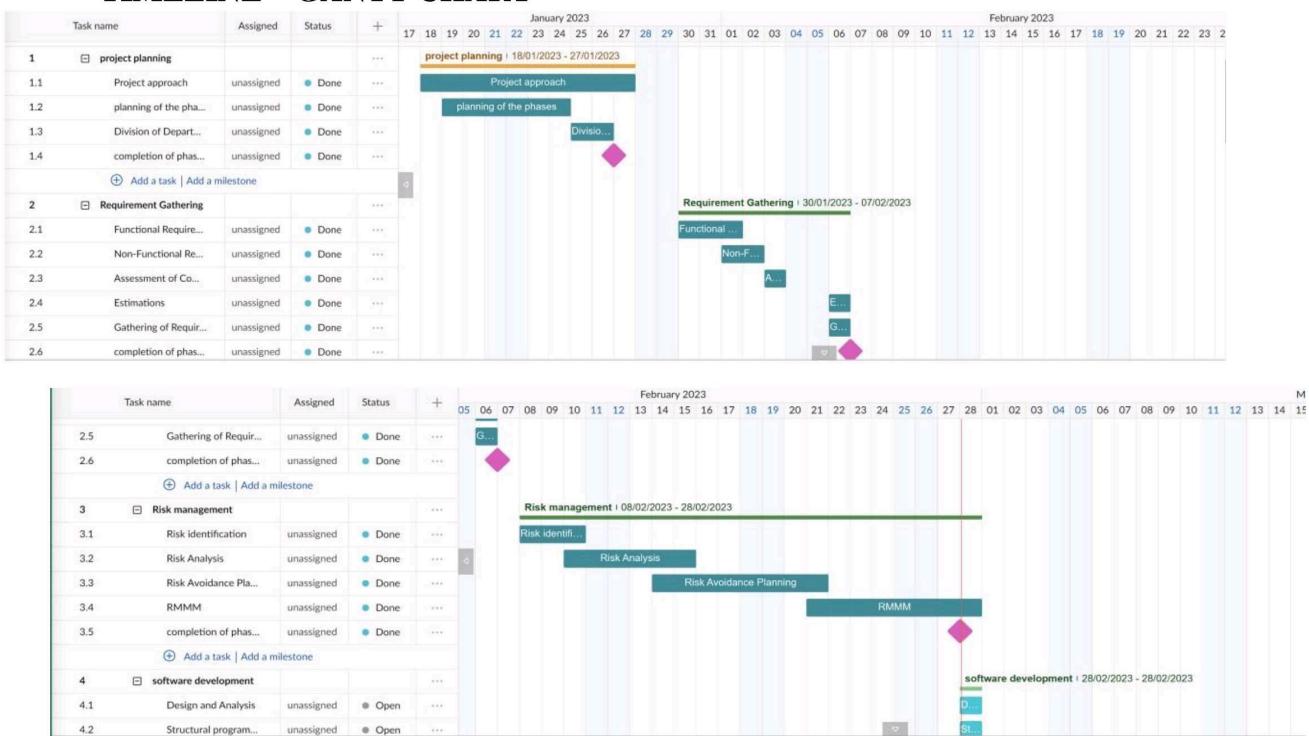
### Team Members:

Sl No	Register No	Name	Role
1	RA2111030010090	D.venkat Kishore	Rep
2	RA2111030010072	K.Goutham	Member
3	RA2111030010075	V.Gurucharan	Member

### WBS

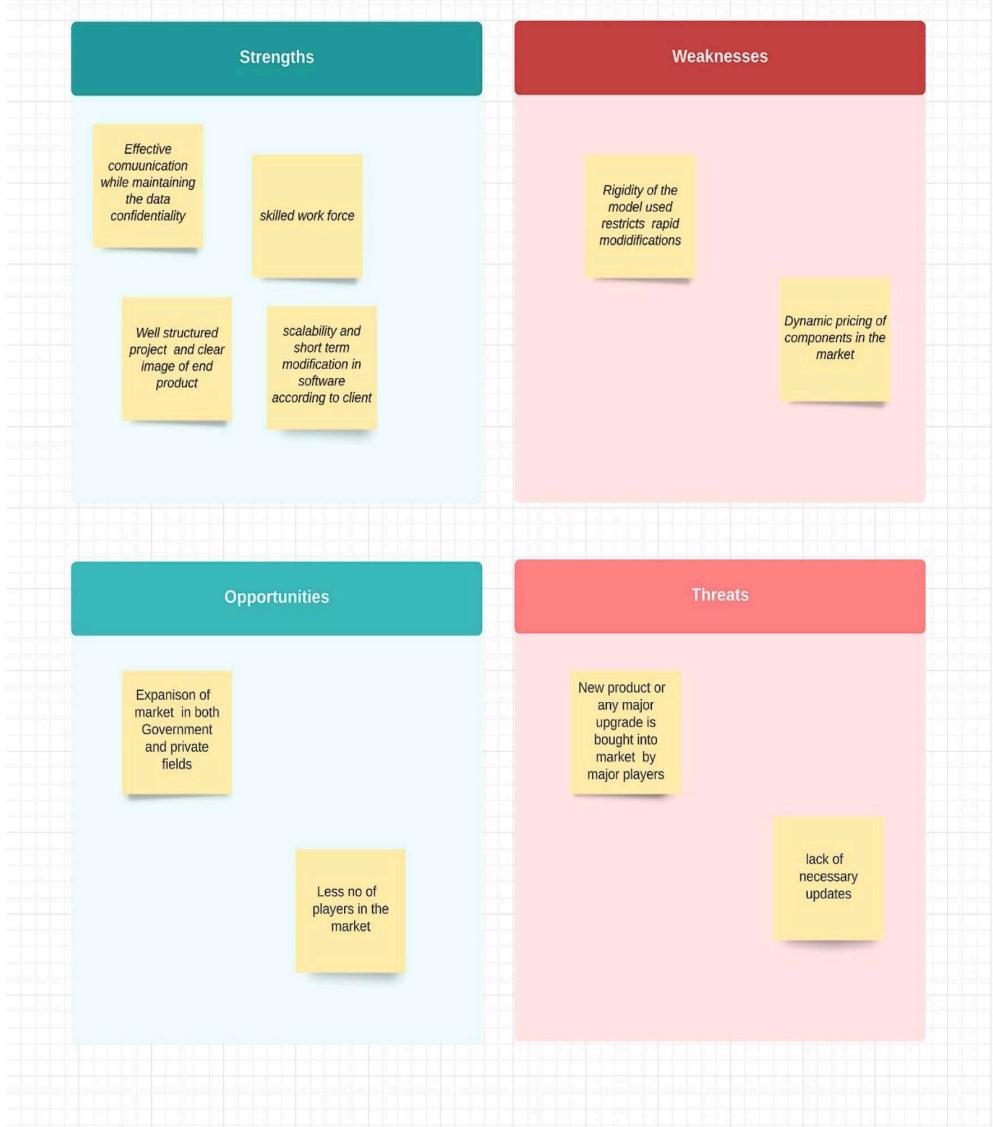


## TIMELINE – GANTT CHART



For full Gantt chart : <https://app.ganttpro.com/#/project/1677523114121/gant>

## RISK ANALYSIS – SWOT & RMMM



## RISK MANAGEMENT TABLE

S.No	Risks	Response	RMMM
1	Requirements are changed at a later changed	Mitigate	Brainstorming and alike activities to be done prior to aid in the Collection of all necessary requirements before the start of development.
2	Project team unable to keep up with schedule	Avoid	Scheduling deadlines for each stage of development and keeping track of the progress periodically. Intervention of the Project manager if required to catch up to the schedule.
3	Staff may be inexperienced	Avoid	Hosting Training Programs and Events prior to the Project initiation and during the in-phase Transitions.
4	Lack of training on project development tools	Accept	
5	Staff size may be too small	Accept	Hiring or recruiting a greater number of skilled staffs
6	Budget may be too low	Accept	Pre-Planning the expenses and reviewing the budget. The budget is to include allocated loss adjustment expenses too (ALAE)
7	The customer may not have technical background	Accept	Providing necessary info regarding how to operate the app, enabling an assisting feature handling the queries of the users

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



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**School of Computing**

**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>	V.Gurucharan
<b>Team Members</b>	KAMI REDDY GOWTHAM REDDY  D.venkatkishore
<b>Register Number</b>	RA2111030010075
<b>Date of Experiment</b>	07-03-2023

**Mark Split Up**

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	5
2	Viva	5	4
	Total	10	9

*P. Gurucharan* 7/3/2023  
Staff Signature with date

## Aim

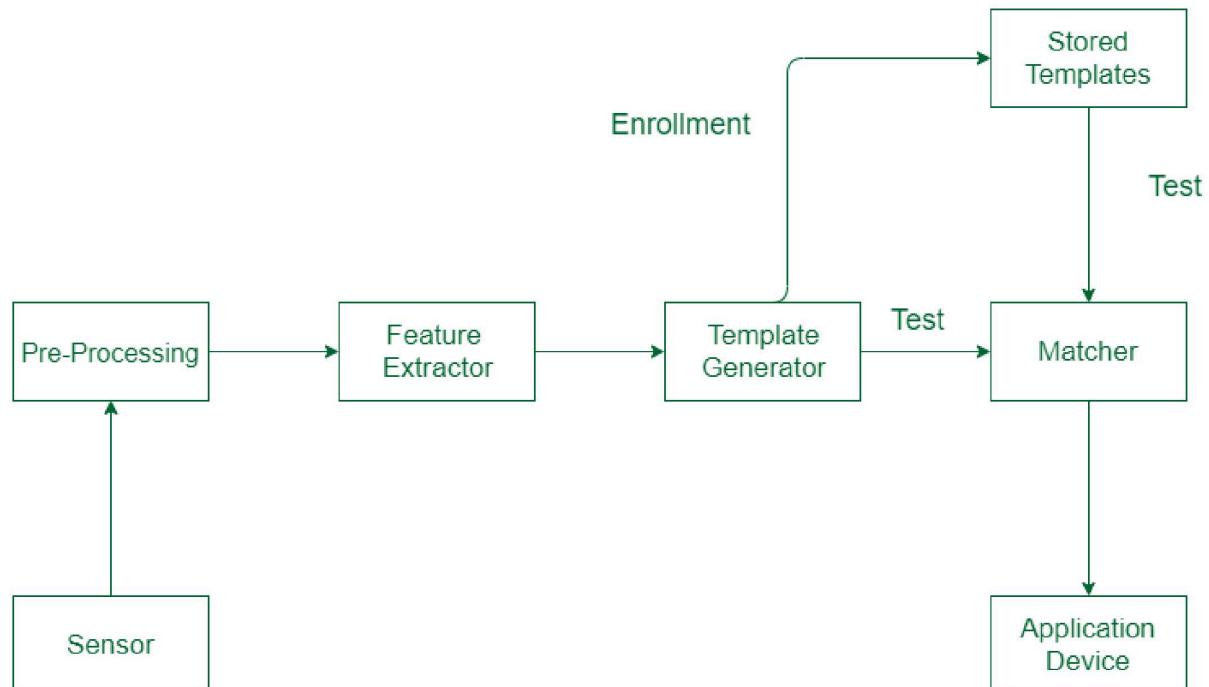
To Design a System Architecture, Use case and Class Diagram

## Team Members:

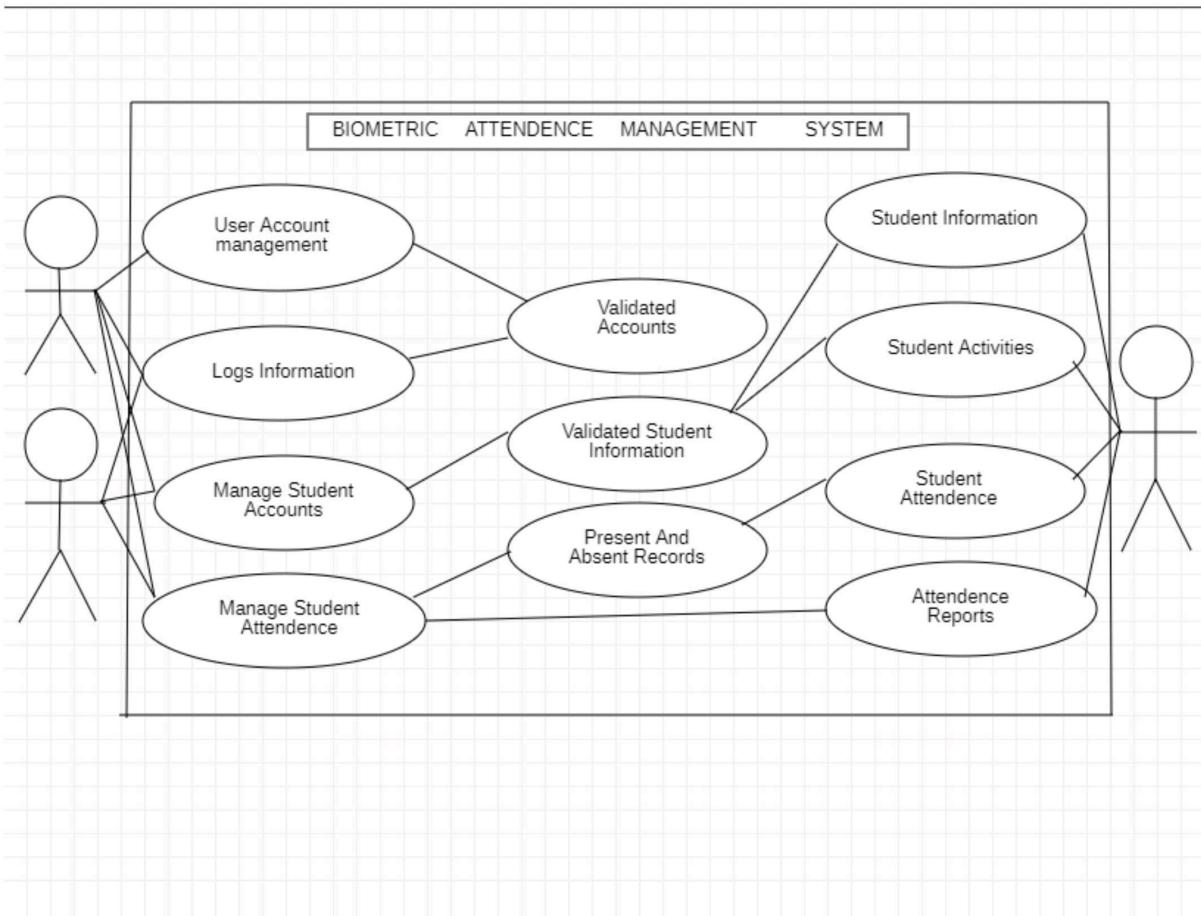
SI No	Register No	Name	Role
1	RA2111030010090	D.VENKAT KISHORE	Rep
2	RA2111030010075	VARANASI GURU CHARAN	Member
3	RA2111030010072	KAMIREDDY GOWTHAM REDDY	Member

Requirements :

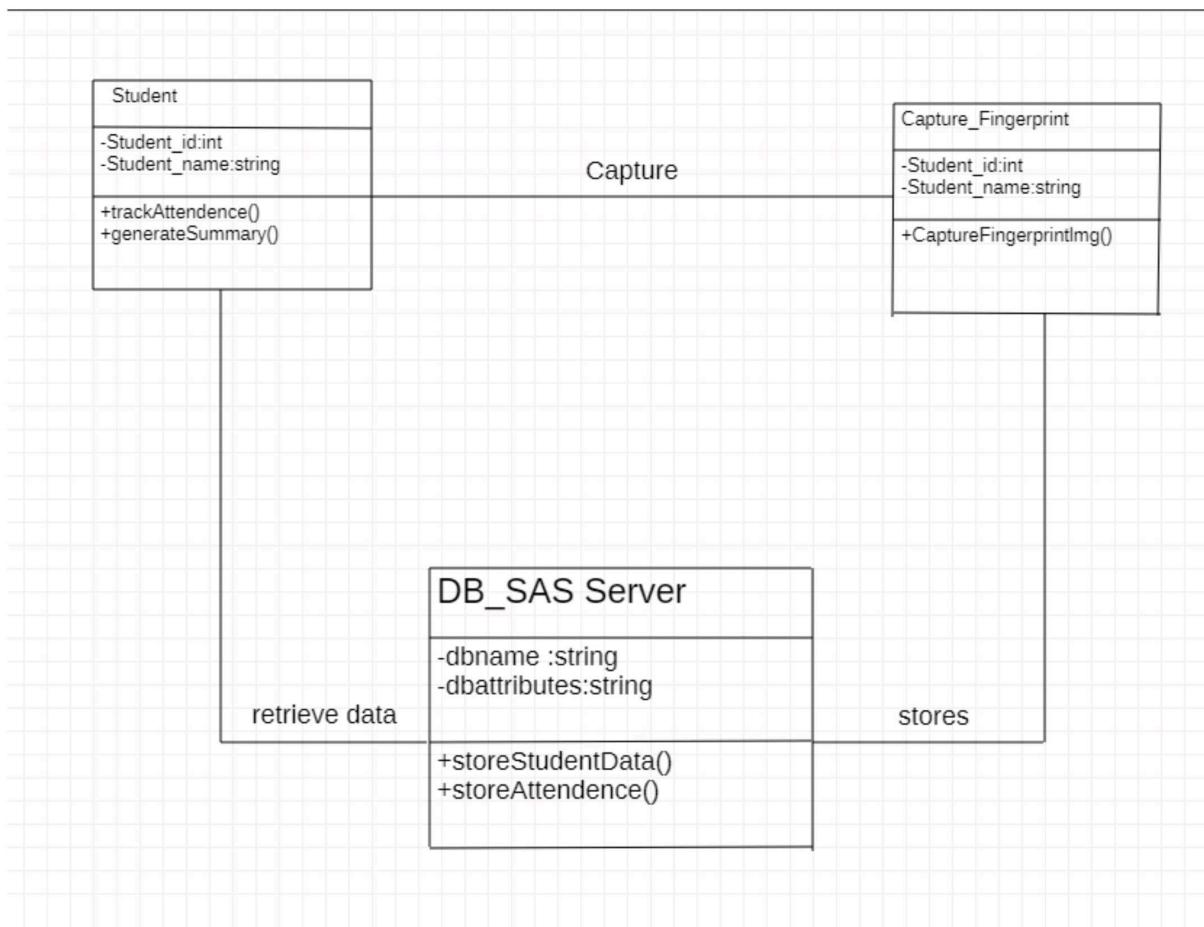
System Architecture :



Use case :



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	V.Gurucharan
Team Members	D.venkat kishore K.Goutham
Register Number	RA2111030010075
Date of Experiment	7-03-2023

### Mark Split Up

S. No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	4
2	Viva	5	3
Total		10	7

  
P. Goutham 15/3/2023  
Staff Signature with date

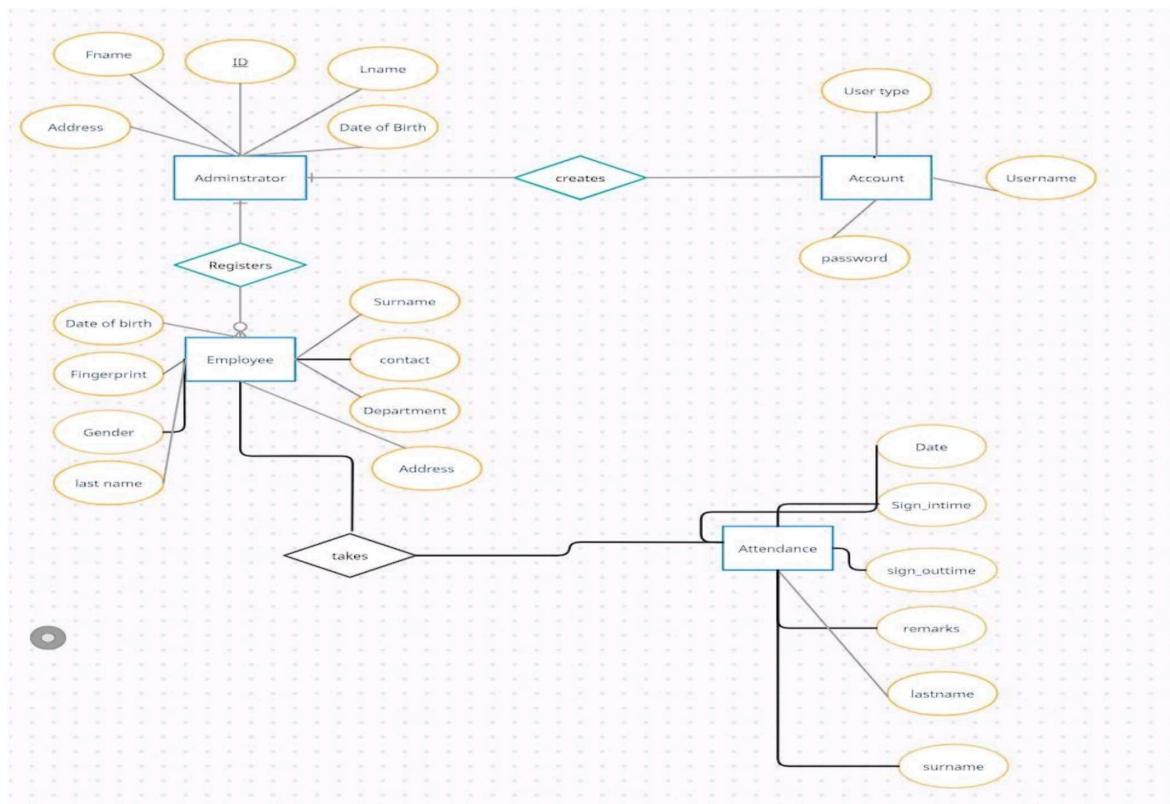
## Aim

To create the Entity Relationship Diagram

### Team Members:

S No	Register No	Name	Role
1	RA2111030010090	D.venkat kishore	Rep
2	RA2111030010072	K.Goutham	Member
3	RA2111030010075	V.Gurucharan	Member

### ER Diagram of University Database



Result:

Thus, the entity relationship diagram was created successfully



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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	Varanasi Gurucharan
Team Members	D.venkatakishore ,K.Goutham reddy
Register Number	RA2111030010075
Date of Experiment	<u>30-03-2023</u>

**Mark Split Up**

S. No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	4
2	Viva	5	3
	Total	10	7

P. Goutham  
Staff Signature with date  
30/3/2023

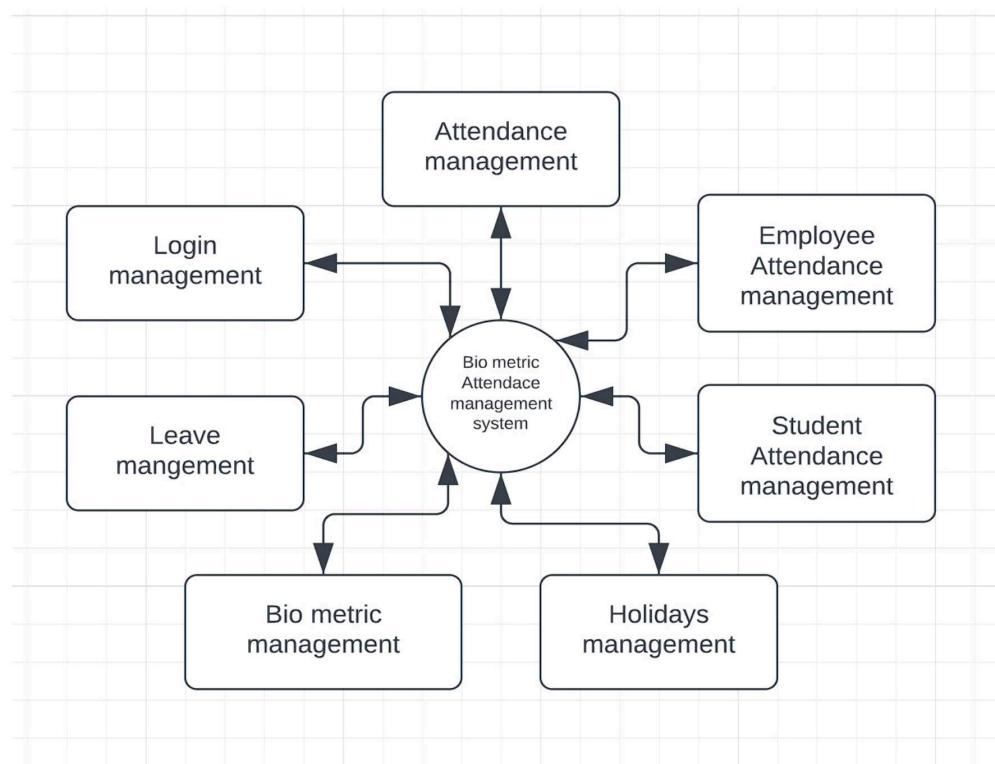
## Aim

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

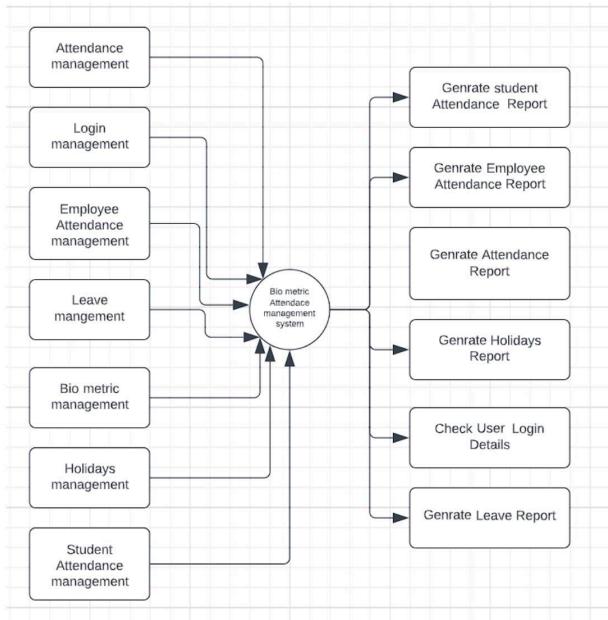
## Team Members:

S No	Register No	Name	Role
1	RA2111030010090	D.venkatakishore	Rep
2	RA2111030010072	K.Goutham reddy	Member
3	RA2111030010075	v.Gurucharan	Member

## Data Flow Diagram Bio-metric Attendance System DFD Level 0



## DFD Level 1



Result:

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



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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	V Guru Charan
Team Members	K.Goutham reddy,D.Venkat Kishore
Register Number	RA2111030010075
Date of Experiment	30/03/2023

**Mark Split Up**

S. No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	5
2	Viva	5	3
	Total	10	8

P. Goutham 30/3/2023  
Staff Signature with date

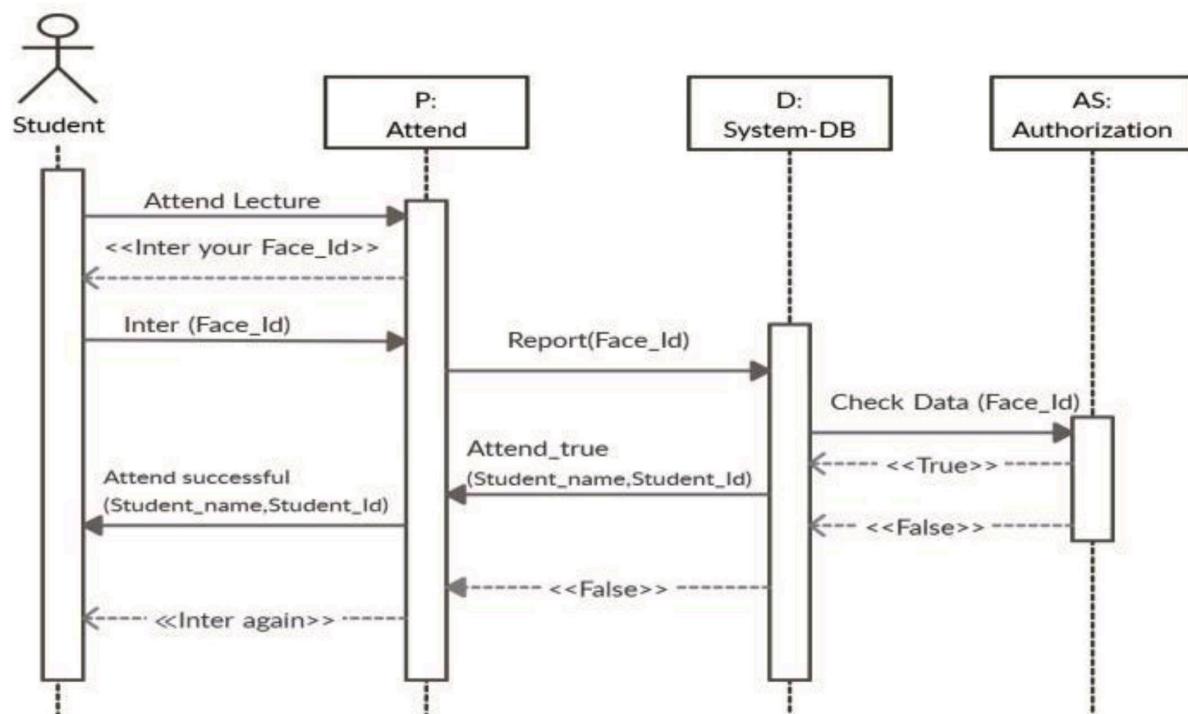
## Aim

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

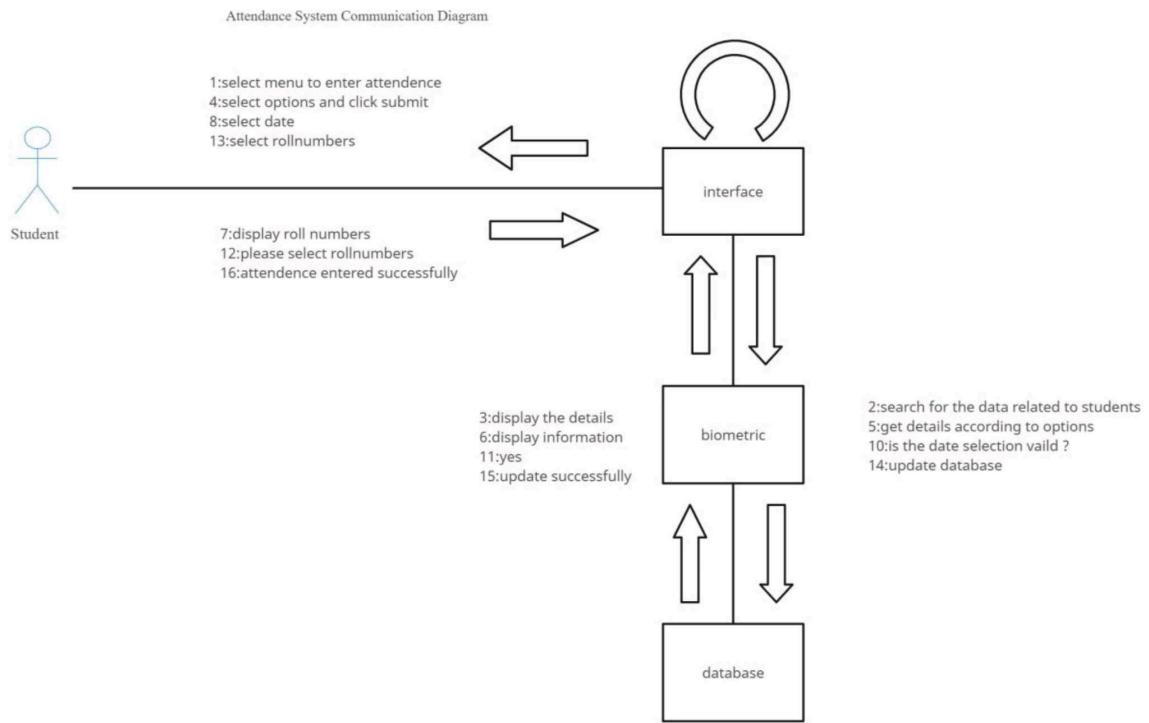
### Team Members:

S No	Register No	Name	Role
1	D.venkat kishore	RA2111030010090	Rep/Member
2	V.gurucharan	RA2111030010075	Member
3	K.goutham reddy	RA2111030010072	Member

### SEQUENCE DIAGRAM :



## collaboration diagram :



Result:

Thus, the sequence and collaboration diagrams were created for the biometric attendance system



## 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>	V.Gurucharan
<b>Team Members</b>	K.Goutham ,D.venkat kishore
<b>Register Number</b>	RA2111030010075
<b>Date of Experiment</b>	30-03-2023

### Mark Split Up

<b>S. No</b>	<b>Description</b>	<b>Maximum Mark</b>	<b>Mark Obtained</b>
1	Exercise	5	4
2	Viva	5	4
	<b>Total</b>	<b>10</b>	<b>8</b>

  
P. Goutham 25/4/2023  
Staff Signature with date

## Aim

To develop the testing framework and/or user interface framework for the biometric attendance system

## Team Members:

S No	Register No	Name	Role
1	RA2111030010090	D.Venkat kishore	Rep/Member
2	RA2111030010075	V.Gurucharan	Member
3	RA2111030010072	K.Goutham	Member

## Executive Summary

### SCOPE:

The scope of testing for an biometric attendance system would be to ensure that the system functions correctly and efficiently, is user-friendly and secure, and meets all the requirements specified by the stakeholders. The scope would also include testing the system's performance, compatibility with different devices and integration with other systems.

### Objectives:

The primary objectives of testing an biometric attendance system application would be to identify and eliminate any defects or bugs in the system, ensure that the system is userfriendly, and meets all the business requirements specified by the stakeholders. Other objectives would include verifying that the system is secure, reliable, and scalable, and that it performs well under different load conditions.

### Approach:

The approach to testing an biometric attendance system application would depend on the specific requirements and characteristics of the system. A typical approach would involve the following steps:

**Requirements Analysis:** Identify the requirements and objectives of the system and define the scope of testing.

**Test Planning:** Develop a test plan that outlines the testing strategy, objectives, scope, and timelines.

**Test Design:** Create test cases and test scenarios that cover all the functionalities of the system.

**Test Execution:** Perform the testing as per the test plan and document any defects or issues that are found

**Defect Management:** Track and manage the defects found during testing, and ensure that they are resolved before release.

**Test Reporting:** Generate test reports that summarize the testing results and provide feedback on the system's performance, usability, and functionality

**Retesting:** Verify that all the defects found during testing have been fixed and retest the system to ensure that it is stable and functional.

Overall, the approach to testing an biometric attendance system application should be systematic, comprehensive, and collaborative, involving all the stakeholders, including developers, testers, and end-users.

## **Test Plan**

## **Scope of Testing**

The scope of testing for an biometric attendance system would depend on several factors, including the system's requirements, the business goals of the application, and the types of risks and challenges associated with the system.

### **Functional:**

for a biometric attendance system would involve testing the system's ability to perform the following functions correctly:

**Enrolling users:** This involves capturing the biometric data of users and storing it in the system's database.

**Authentication:** The system should be able to authenticate users based on their biometric data, such as fingerprints, facial recognition, or iris scanning.

**Recording attendance:** The system should accurately record the attendance of users who have been authenticated.

**Reporting:** The system should generate accurate reports on attendance data, such as daily, weekly, or monthly reports.

Error handling: The system should be able to handle errors, such as when a user's biometric data cannot be recognized, and provide appropriate error messages.

Security: The system should have appropriate security measures in place to protect user data and prevent unauthorized access.

Integration: The system should integrate seamlessly with other systems such as payroll and HR systems.

Usability: The system should be user-friendly and easy to use, with clear instructions and feedback to users.

Overall, functional testing for a biometric attendance system should ensure that the system is reliable, accurate, and efficient in recording and reporting attendance data for users.

**Non-Functional:**

for a biometric attendance system would involve testing the system's non-functional requirements, which are related to the system's performance, security, usability, and other factors. The following are some examples of non-functional testing that can be performed on a biometric attendance system:

Performance testing: This involves testing the system's ability to handle a large number of users and transactions, as well as its response time under different load conditions.

Security testing: This involves testing the system's security features, such as encryption, access control, and authentication mechanisms, to ensure that user data is protected from unauthorized access and theft.

Usability testing: This involves testing the system's user interface, navigation, and overall user experience to ensure that users can easily use the system without difficulty.

Compatibility testing: This involves testing the system's compatibility with different devices, browsers, and operating systems, to ensure that the system works correctly on various platforms.

Reliability testing: This involves testing the system's ability to perform consistently and reliably under different conditions, such as power failures, network disruptions, and other unexpected events.

Availability testing: This involves testing the system's availability, or the ability to be accessed and used by users, to ensure that the system is always available when needed.

Scalability testing: This involves testing the system's ability to handle a growing number of users and transactions, without compromising its performance or security.

Overall, non-functional testing for a biometric attendance system should ensure that the system meets the required performance, security, usability, compatibility, and reliability standards, and is able to perform optimally under various conditions.

## **Types of Testing, Methodology, Tools**

Category	Methodology	Tools Required
Functional Testing	Black box testing, Integration testing	Selenium, Appium, TestComplete, JUnit, TestNG
Non-Functional Testing	Performance testing, Security testing, Usability testing, Compatibility testing, Reliability testing, Availability testing, Scalability testing	JMeter, LoadRunner, AppScan, SoapUI, Selenium, TestComplete

**Result:**

Thus, the testing framework/user interface framework has been created for the bio metric attendance system.



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**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 & Reporting
<b>Name of the candidate</b>	V.Gurucharan
<b>Team Members</b>	D.Venkat Kishore, K.Goutham
<b>Register Number</b>	RA2111030010075
<b>Date of Experiment</b>	06-04-2023

**Mark Split Up**

<b>S. No</b>	<b>Description</b>	<b>Maximum Mark</b>	<b>Mark Obtained</b>
1	Exercise	5	5
2	Viva	5	4
<b>Total</b>		<b>10</b>	<b>9</b>

P. Goutham  
25/4/2023  
Staff Signature with date

## Aim

To develop the test cases manual with manual test case report for the bio metric attendance system

### Team Members:

S No	Register No	Name	Role
1	RA2111030010090	D.Venkat kishore	Rep
2	RA2111030010075	V.Gurucharan	Member
3	RA2111030010072	K.Goutham	Member

## Test Case

### Functional Test Cases

Test ID (#)	Test Scenario	Test Case	Execution Steps	Expected Outcome	Actual Outcome	Status	Remarks
1	Enrollment	Enrollment of new candidate	1. Navigate to enrollment screen 2. Enter user information 3. Capture user biometric data 4. Save user information and biometric data	User information and biometric data are saved successfully	User information and biometric data are saved successfully	pass	success
2	Authentication	Authentication of the user login	. Navigate to authentication screen 2. Enter user ID 3. Capture user biometric data 4. Verify user identity	User identity is verified successfully and attendance is recorded	User identity is verified successfully and attendance is recorded	pass	success

			5. Record user attendance				
3	Attendance Recording	The record of Attendance is maintained ?	1. Navigate to attendance recording screen 2. Select date and time period 3. Generate attendance report	Attendance report is generated correctly, with all users' attendance data for the selected date and time period	Attendance report is generated	pass	Success
4	Error Handling	Response for invalid inputs	1. Navigate to authentication screen 2. Enter invalid user ID 3. Capture user biometric data 4. Verify user identity	Error message is displayed indicating that the user ID is invalid	Error message is displayed	Pass	success
5	Security	Encryption and secure storage of data	1. Verify that user biometric data is encrypted and stored securely	User biometric data is encrypted and stored securely	User biometric data is encrypted and stored securely	pass	success
6	Usability	User interface is user-friendly	1. Verify that user interface is user-friendly and easy to use	User interface is user-friendly and easy to use	User interface is user-friendly and easy to use	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 system	1. Simulate a high volume of concurrent users 2. Verify that system response time	System response time remains within acceptable limits for the	System response time remains within acceptable limits for the	pass	success

			remains within acceptable limits	simulated volume of concurrent users	simulated volume of concurrent users		
2	Compatibility	Compatibility of system with various platforms	1. Test the system's compatibility with various web browsers, devices, and operating systems	System functions correctly on all tested browsers, devices, and operating systems	System functions correctly on all tested browsers, devices, and operating systems	pass	success
3	Reliability	Reliability	1. Test the system's ability to perform consistently and reliably under various conditions, such as power failures, network disruptions, and other unexpected events	System continues to function correctly under unexpected events and conditions	System continues to function correctly under unexpected events and conditions	Pass	success
4	Availability	Availability	1. Test the system's availability, or the ability to be accessed and used by users	System is available for use at all times during expected usage hours	System is available for use at all times during expected usage hours	pass	success
5	Scalability	Scalability	1. Test the system's ability to handle a growing number of users and transactions, without compromising its performance or security	System can handle a growing number of users without experiencing significant performance or security issues	System can handle a growing number of users without experiencing significant performance or security issues	pass	success

Category	Progress Against Plan	Status
Functional Testing	Green	Completed
Non-Functional Testing	Green	completed

Result:

Thus, the test case manual and report has been created for the bio metric attendance system.



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## School of Computing

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	12
Title of Experiment	Provide the details of Architecture Design/Framework/Implementation
Name of the candidate	V.guru charan
Team Members	D.venkat kishore,k.goutham reddy
Register Number	RA2111030010075
Date of Experiment	24-04-2022

### Mark Split Up

S. No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	3
2	Viva	5	4
Total		10	7

  
Staff Signature with date  
28/4/2023

## Aim

To provide the details of architectural design/framework/implementation

## Team Members:

S No	Register No	Name	Role
1	RA2111030010090	D.venkat kishore	Rep/Member
2	RA2111030010075	v.guru charan	Member
3	RA2111030010072	k.goutham reddy	Member

The screenshot shows the 'Attendance Report Generate' section of the Admin portal. On the left, there's a sidebar with navigation links like Dashboard, Department, Send Notification, Result Prediction, Students, and Report. The main area has a title 'Attendance Report Generate' and three dropdown menus: Computer, FE, and All. Below them is a table showing attendance data for Software Architecture(4) across three PRNs: 4001, 4004, and 560099. Each row shows a count of 1 and a percentage of 1(25.0%). At the bottom, it says 'Defaulter PRN is: 4001, 4004, 560099,' and there are 'Print' and 'Save' buttons.

Attendance Portal This form is used by the students to verify attendance in lectures.

The screenshot shows the 'Add Subject' page in the Admin portal. The sidebar includes links for Dashboard, Department (with Add Department), Staff (with Add Staff), Subject (with Add Subject), Send Notification, Result Prediction, Students, and Report. The main area has a title 'Add Subject' and several input fields: 'Select Department' (dropdown), 'Select Class' (dropdown), 'Select Semester' (dropdown), 'Subject Name' (text input with placeholder 'Please fill out this field.'), and 'Require hours' (radio button). A 'Save' button is at the bottom.

Courses: This form is a platform to create, edit and delete courses as shown in Figure

**Admin**

Add Department

Department name

SAVE

Dashboard  
Department  
Add Department  
Department  
Add Staff  
Staff  
Add Subject  
Show Subject  
Send Notification  
Result Prediction  
Students  
Report

**Department:** It shows the department of the students, making it feasible for a lecture hall comprising of different departments.

**Admin**

Add Staff

First Name

Last Name

Department

Email

Password

Qualification

Specialization

Dashboard  
Department  
Add Department  
Department  
Add Staff  
Staff  
Add Subject  
Show Subject  
Send Notification  
Result Prediction  
Students  
Report

**Lecturers:** This form provides the functionality to create, edit and delete lecturers.

The screenshot shows a web-based administrative interface. The top navigation bar is green with the word "Admin" on the left and a three-line menu icon on the right. On the far left, there is a vertical black sidebar containing several menu items with icons: Dashboard, Department, Send Notification, Result Prediction, Students (selected), Show Student, and Report. The main content area has a yellow header bar labeled "STUDENT INFORMATION". Below this is a table with the following data:

PRN	Name	Department	Class	Mobile	Gender	Profile
4001	Emmanuel	Computer	FE	9632542369	Male	
4002	sudahakar	Information Technology	SE	8536952136	Male	
4004	sunny	Computer	FE	8532123659	Male	
560099	Sujith Joshua	Computer	FE	9901690483	Male	

Test Result :a pictorial view of the test result. It consists of the following better sorting and an overall arranged system

Result:

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

## CONCLUSION:

In conclusion, biometric attendance systems have become a popular and effective solution for tracking employee attendance in the workplace. They offer numerous benefits including improved accuracy, increased efficiency, and reduced administrative burden. Additionally, these systems provide increased security and prevent buddy punching and time theft. While there may be initial costs associated with implementing a biometric attendance system, the long-term benefits make it a worthwhile investment for any organization. Overall, biometric attendance systems are a reliable and efficient means of monitoring employee attendance and productivity.

## REFERENCE:

Freeprojetz: [www.freeprojetz.com](http://www.freeprojetz.com)

Github: [biometric-attendance · GitHub Topics · GitHub](https://github.com/topics/biometric-attendance)

Skyfilabs: [Top 5 Projects Based on Biometrics \(skyfilabs.com\)](https://skyfilabs.com/)

IEEEexplore: [Biometric attendance | IEEE Conference Publication | IEEE Xplore](https://ieeexplore.ieee.org/xpl/advancedSearch.jsp?tp=&arnumber=&queryText=Biometric%20attendance)