GUJARAT TECHNOLOGICAL UNIVERSITY

Chandkheda, Ahmadabad Affiliated

S.S. AGRAWAL INSTITUTE OF ENGINEERING & TECHNOOGY COLLEGE [123]

A Report on

AI Powered Attendance Capturing System

Under subject of

DESIGN ENGINEERING

B. E. III, Semester – V

(Computer Branch)

Submitted by:

Name of Students	Enrollment No.
Ayush Saxena	181230107002
Bherwani Bhavyesh J.	181230107005
Donda Preet T.	181230107011
Karmakar Sudip S.	181230107017
Masrani Jay H.	181230107024

Prof. Vatsal Patel
(Faculty Guide)

Prof. Jijeesh Baburajan
(Head of the Department)

S. S. Agrawal Institute of Engineering & Technology (123)

CERTIFICATE

This is to certify that Students of Group Id: 257829

1. *Ayush Saxena. (181230107002)*
2. *Bherwani Bhavyesh J. (181230107005)*
3. *Donda Preet T. (181230107011)*
4. *Karmakar Sudip S. (181230107017)*
5. *Masrani Jay H. (181230107024)*

Of 3rd year (5th sem.) have completed their project work successfully and satisfactorily in the subject of Design Engineering (3140005) on Date _____in Computer Engineering Department.

_____ _____

Faculty Guide *Head of Department*

_____ _____

Internal Examiner *External Examiner*

GUJARAT TECHNOLOGICAL UNIVERSITY

CERTIFICATE FOR COMPLETION OF ALL ACTIVITIES AT ONLINE DESIGN PORTAL

SUBJECT : DE2A-3150001

B.E. SEMESTER V, ACADEMIC YEAR 2020-2021

Date of certificate generation : 04 December 2020 (10:16:09)

This is to certify that, ***AYUSH SAXENA*** (Enrolment Number - 181230107002) working on project entitled with ***AI-Powered Attendance Capturing System*** from ***Computer Engineering*** department of ***S.S.AGRAWAL INSTITUTE OF ENGINEERING & TECHNOLOGY, NAVSARI*** had submitted following details at ONLINE OPEN DESIGN SCHOOL PORTAL.

AEIOU & Mind Map Canvas	**Completed**
Empathy Canvas	**Completed**
Ideation Canvas	**Completed**
Product Development Canvas	**Completed**
Prototype	**Completed**
Report	**Completed**

Name of Student : AYUSH SAXENA

Name of Guide : Mr. PATEL VATSAL SUMANTRAI

Signature of Student : _____

*Signature of Guide : _____

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CERTIFICATE FOR COMPLETION OF ALL ACTIVITIES AT ONLINE DESIGN PORTAL

SUBJECT : DE2A-3150001

B.E. SEMESTER V, ACADEMIC YEAR 2020-2021

Date of certificate generation : 04 December 2020 (10:47:41)

This is to certify that, ***BHERWANI BHAVYESH JAIKISHAN*** (Enrolment Number - 181230107005) working on project entitled with ***AI-Powered Attendance Capturing System*** from ***Computer Engineering*** department of ***S.S.AGRAWAL INSTITUTE OF ENGINEERING & TECHNOLOGY, NAVSARI*** had submitted following details at ONLINE OPEN DESIGN SCHOOL PORTAL.

AEIOU & Mind Map Canvas	**Completed**
Empathy Canvas	**Completed**
Ideation Canvas	**Completed**
Product Development Canvas	**Completed**
Prototype	**Completed**
Report	**Completed**

Name of Student : BHERWANI BHAVYESH JAIKISHAN

Name of Guide : Mr. PATEL VATSAL SUMANTRAI

Signature of Student : _____

*Signature of Guide : _____

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CERTIFICATE FOR COMPLETION OF ALL ACTIVITIES AT ONLINE DESIGN PORTAL

SUBJECT : DE2A-3150001

B.E. SEMESTER V, ACADEMIC YEAR 2020-2021

Date of certificate generation : 04 December 2020 (10:41:47)

This is to certify that, ***DONDA PREET TRIBHUVANBHAI*** (Enrolment Number - 181230107011) working on project entitled with ***AI-Powered Attendance Capturing System*** from ***Computer Engineering*** department of ***S.S.AGRAWAL INSTITUTE OF ENGINEERING & TECHNOLOGY, NAVSARI*** had submitted following details at ONLINE OPEN DESIGN SCHOOL PORTAL.

AEIOU & Mind Map Canvas	**Completed**
Empathy Canvas	**Completed**
Ideation Canvas	**Completed**
Product Development Canvas	**Completed**
Prototype	**Completed**
Report	**Completed**

Name of Student : D O N D A P R E E T TRIBHUVANBHAI

Name of Guide : M r . P A T E L V A T S A L SUMANTRAI

Signature of Student : _____

*Signature of Guide : _____

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CERTIFICATE FOR COMPLETION OF ALL ACTIVITIES AT ONLINE DESIGN PORTAL

SUBJECT : DE2A-3150001

B.E. SEMESTER V, ACADEMIC YEAR 2020-2021

Date of certificate generation : 04 December 2020 (10:13:17)

This is to certify that, ***KARMAKAR SUDIP SANKAR*** (Enrolment Number - 181230107017) working on project entitled with ***AI-Powered Attendance Capturing System*** from ***Computer Engineering*** department of ***S.S.AGRAWAL INSTITUTE OF ENGINEERING & TECHNOLOGY, NAVSARI*** had submitted following details at ONLINE OPEN DESIGN SCHOOL PORTAL.

AEIOU & Mind Map Canvas	**Completed**
Empathy Canvas	**Completed**
Ideation Canvas	**Completed**
Product Development Canvas	**Completed**
Prototype	**Completed**
Report	**Completed**

Name of Student : KARMAKAR SUDIP SANKAR

Name of Guide : Mr.PATEL VATSAL SUMANTRAI

Signature of Student : _____

*Signature of Guide : _____

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CERTIFICATE FOR COMPLETION OF ALL ACTIVITIES AT ONLINE DESIGN PORTAL

SUBJECT : DE2A-3150001

B.E. SEMESTER V, ACADEMIC YEAR 2020-2021

Date of certificate generation : 04 December 2020 (22:23:19)

This is to certify that, ***MASRANI JAYKUMAR HARBANS*** (Enrolment Number - 181230107024) working on project entitled with ***AI-Powered Attendance Capturing System*** from ***Computer Engineering*** department of ***S.S.AGRAWAL INSTITUTE OF ENGINEERING & TECHNOLOGY, NAVSARI*** had submitted following details at ONLINE OPEN DESIGN SCHOOL PORTAL.

AEIOU & Mind Map Canvas	**Completed**
Empathy Canvas	**Completed**
Ideation Canvas	**Completed**
Product Development Canvas	**Completed**
Prototype	**Completed**
Report	**Completed**

Name of Student : MASRANI JAYKUMAR HARBANS

Name of Guide : Mr. PATEL VATSAL SUMANTRAI

Signature of Student : _____

*Signature of Guide : _____

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*Guide has to sign the certificate, Only if all above activities has been Completed.

ACKNOWLEDGEMENT

It gives us immense pleasure to present this project on **AI Powered Attendance Capturing System.** It was a great experience and some credit also goes to the S.S. Agrawal Institute of Engineering and Technology for allowing us to undertake the project work, as the part of the study.

We would like to thank Prof. Vatsal Patel (Project Guide) for giving us his time and also a chance to undertake this project. The opportunity to study and work here added a lot to my knowledge and experience.

We would also like to thank Prof. Jijesh Baburajan (HOD) who gave us his special guidance, suggestions and for teaching us methodical implementation of the real-life application of the project.

We would also like to thank all the staff members of the computer department of S.S. Agrawal Institute of Engineering and Technology for their kind co-operation extended to us to make this project work comfortable.

ABSTRACT

Maintaining Attendance Percentage of students is a tedious task which is done by many professors/ teachers/ managers in colleges/ schools/ offices. Also, biometric methods are inefficient and time-consuming, so to solve it we will create a software-based system which will recognize the faces and will store the data accordingly and then data can be used accordingly.

INDEX

1. CONTENTS

1.1 Introduction to concept/ idea

Team Members:
1. Ayush Saxena
2. Bherwani Bhavyesh J.
3. Donda Preet T
4. Karmakar Sudip S.
5. Masrani Jay H.

What is Design Thinking?

Design thinking is a method used by engineers as well as designers to solve complex problems for users and clients. Design thinking is based upon logic, imagination, institution and systematic reasoning to explore possibilities of what could be created and outcome that benefit to the user at the end.

1.2 Empathy Mapping:

1.3 Observation through AEIOU & Other Method:

Domain: AI Powered Attendance Capturing System

We have chosen AI Powered Attendance Capturing System as our domain, because taking attendance manually takes time. So, by implementing this system will save time in classroom and will automatically update the student's attendance automatically in database.

1.4 Role Playing:

All of our group members took their time to check which camera implementation will be perfect for our system and which camera will best fit for this system. Our team also took a deep dive for which language and framework will be used for facial recognition.

1.5 Mind Mapping:

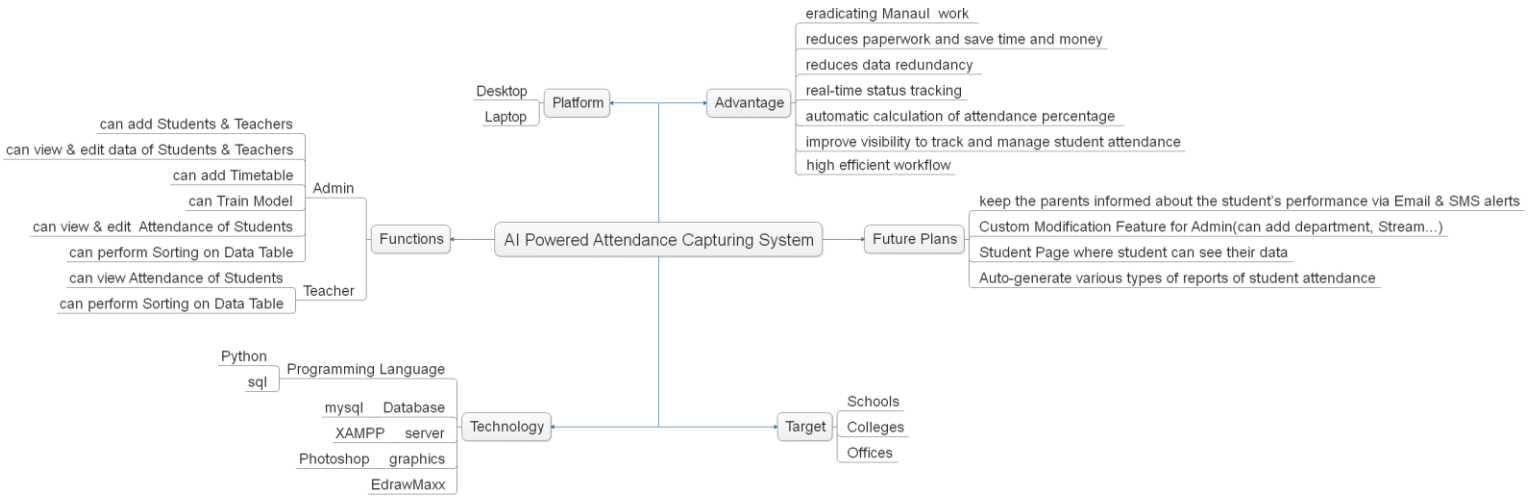


Figure: Mind mapping canvas

2. AEIOU

Our group's area of interest is to determine the problem of the AI Powered Attendance Capturing System.

2.1 AEIOU:

- Activities
- Environment
- Interaction
- Objects
- Users

2.2 Activities:

- Capturing photo
- Recognizing faces
- Add new student/user
- Delete new student/user
- Filling Attendance

2.3 ENVIRONMENT:

During empathy mapping the factors of the environment are very crucial and must be taken in to consideration.

- Noisy
- Crowdy
- Warm
- Cool

2.4 INTERACTION:

- Camera – Student's Face
- Computer – Camera
- Computer – Database
- Administrator - Software

2.5 OBJECTS:

- Camera
- Computer
- Internet
- Images

2.6 USERS:

- Students
- Admin
- Professor
- Teachers
- Manager
- Office Staff

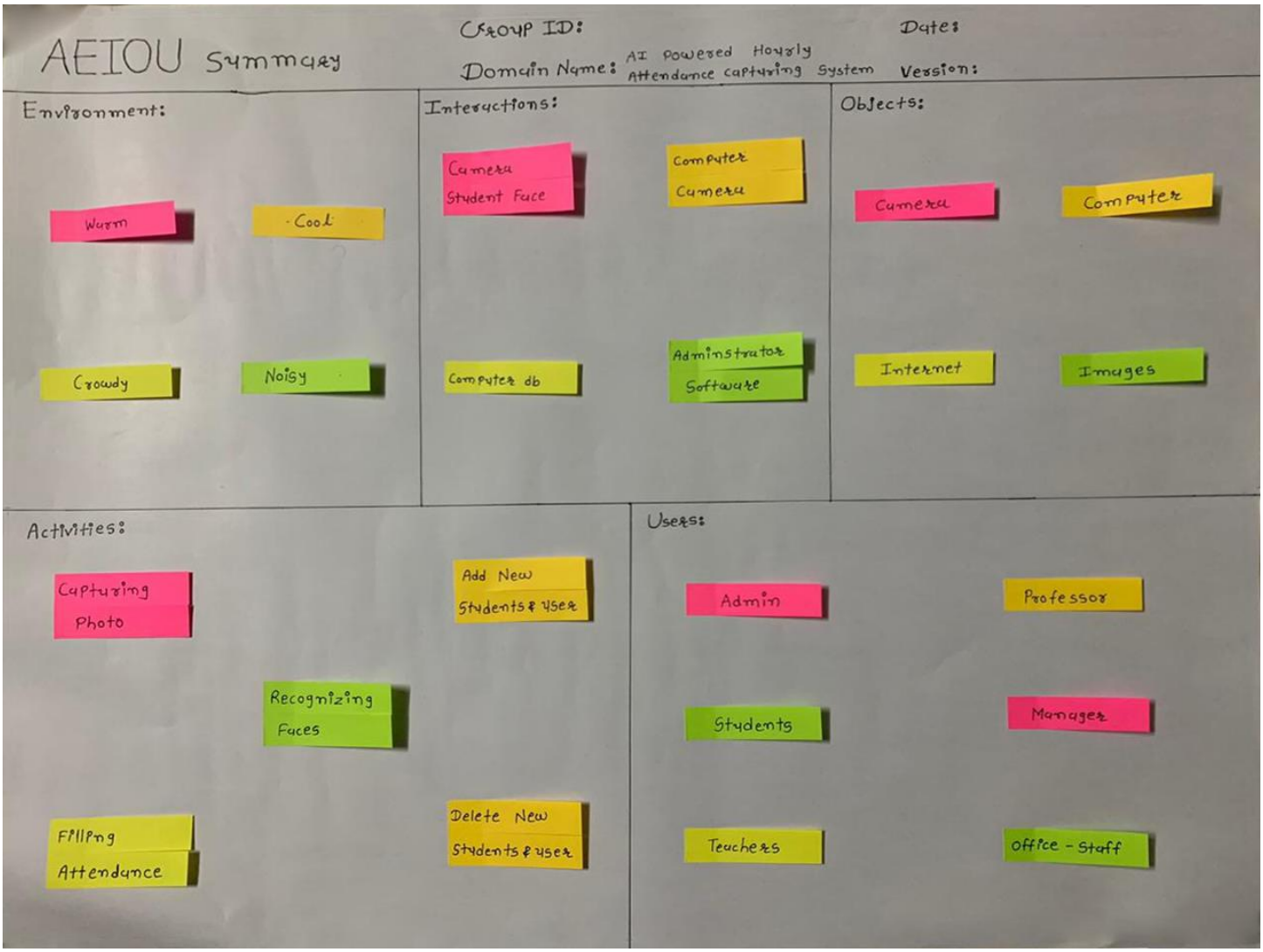


Figure. AEIOU CANVAS

Based on this observation of AEIOU we come to know about the various parameters to decide the problem of AI Powered Attendance Capturing System. By these entire observations, we came to know about various objects, peoples involved in the activities of AI Powered Attendance Capturing System. By observing the entire problem, we divided the problems in different parts so we can find the solution in systematically order.

3. EMPATHY MAPPING

3.1 USER FOR EMPATHY MAPPING:

- Students
- Professors
- Teacher
- Manager
- Office Staff

3.2 STAKEHOLDERS:

- Students
- Office Staff

3.2 ACTIVITIES:

- Scanning Card
- Scanning Finger
- Checking Attendance

3.4 STORIES BOARDING:

HAPPY:

Before implementing biometric scanning, system user's company was using RFID card system where user have to had RFID card and if he forgets to bring the RFID card he had to run back home to grab the RFID card but After implementing biometric scanning system there was no need of any card, just finger was required.

SAD:

In winter season the skin on the finger starts peeling off due to which the biometric scanner won't recognize the person and thus he/she won't able to get the attendance for the whole day. In monsoon season when finger get wet the biometric scanner won't recognize the finger. And Because of this all other students or staff have to wait for their chance as there is only one or two Biometric system available.

HAPPY:

In monsoon season a user was waiting for bus in bus stand and the user's phone rang so the user reached his pocket to get phone but the user was unaware that he kept RFID card in same pocket with his phone as soon as he took his phone out of the pocket his RFID card fell in a puddle of water but as the RFID card was water proof so there was no damage on it, and it didn't cost user's time to replace it.

SAD:

When the RFID card get lost students or office worker won't get the attendance for whole day and he or she had to meet the admin of RFID card system for generation and deactivation of previous RFID card which require more time and if the card gets in the hand of an unknown person then he/she can misuse the RFID card for unethical purpose.

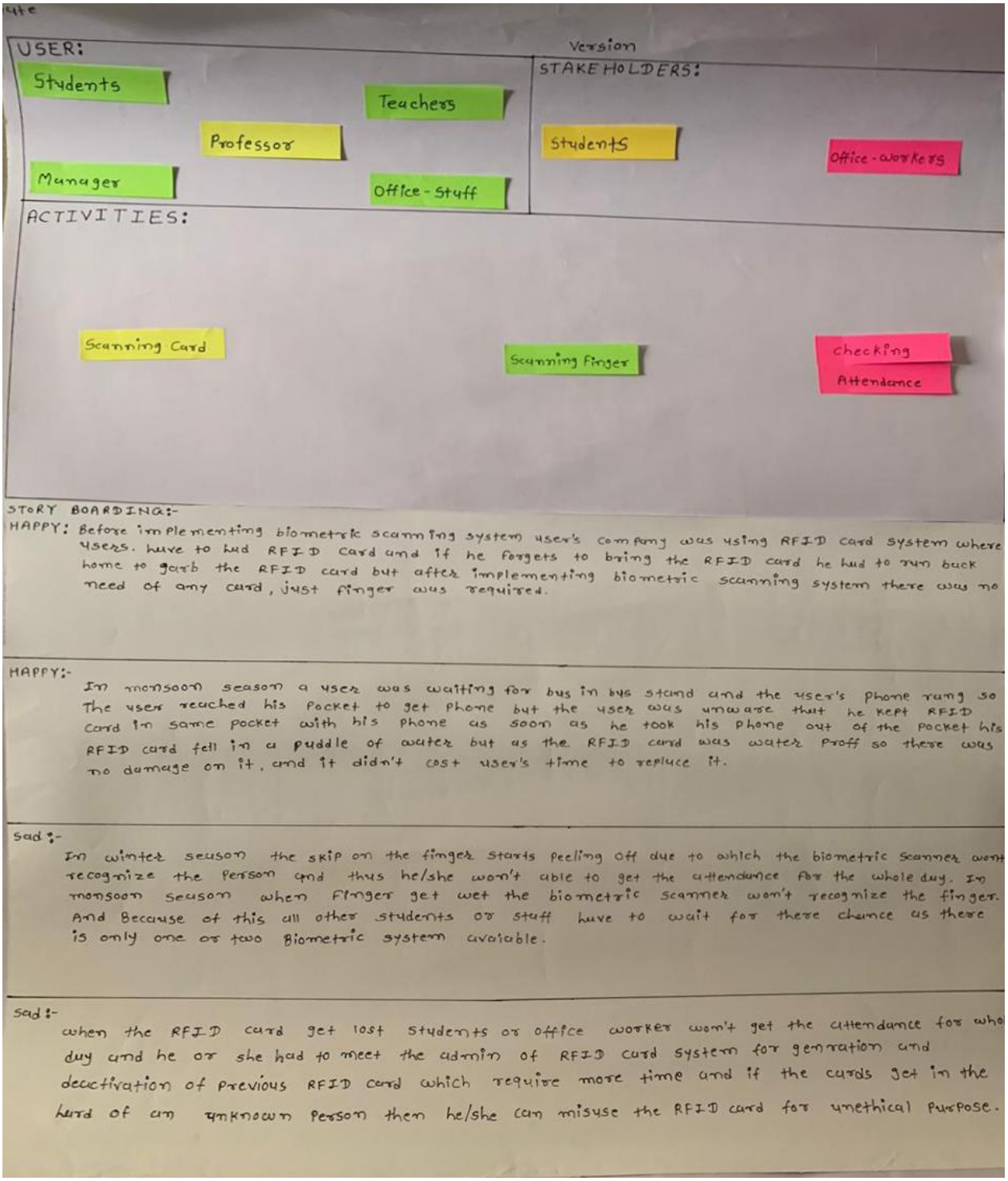


Figure. EMPATHY CANVAS

4. IDEATION CANVAS

Our group makes ideation canvas for the domain AI Powered Attendance Capturing System.

4.1 The following people are involved in AI Powered Attendance Capturing System:

- Students
- Teachers
- Staff
- Professors

4.2 Situation/Contexts/Location: -

- During Lectures - Attendance – College
- RFID card lost
- Injury in finger - Biometric method fail
- Rainy - Biometric method fail

4.3 ACTIVITIES:

- Manually Taking Attendance
- Attendance Through Biometric Method
- Attendance Through RFID Method

4.4 PROPS/POSSIBLE SOLUTIONS:

- Computer + ML + camera = Automated Attendance Capturing System

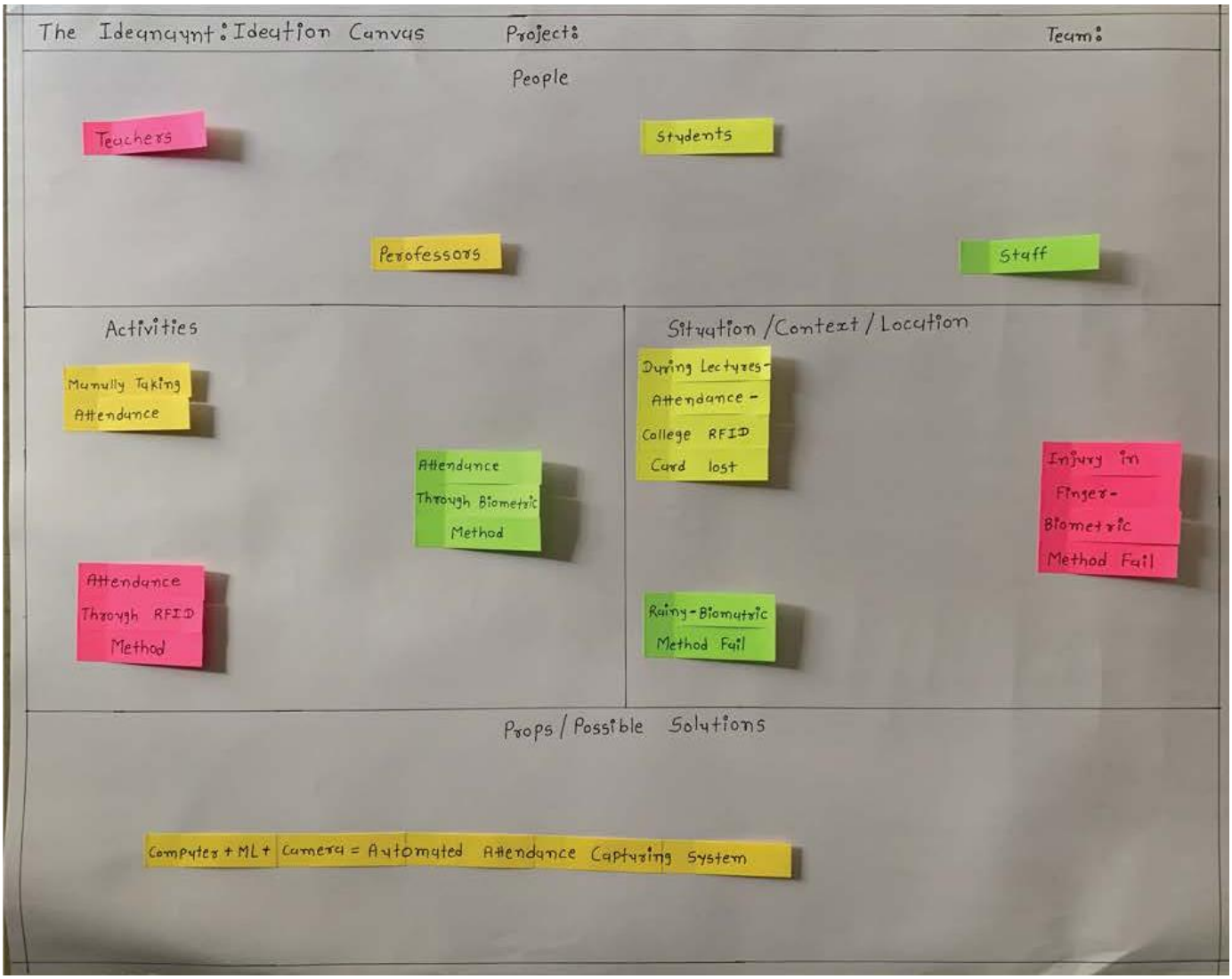


Figure. IDEATION CANVAS

5. PRODUCT DEVELOPMENT CANVAS:

Our group makes product development canvas for the domain AI Powered Attendance Capturing System.

5.1 PURPOSE:

- store attendance in database
- generate attendance report
- saves time
- reduce manual error

5.2 PEOPLE:

- Students
- Professors
- Teachers
- Admin
- Office Staff

5.3 COMPONENTS:

- Database
- Camera
- Server

5.4 PRODUCT FEATURES:

- OpenCV
- Machine Learning

5.5 PRODUCT FUNCTION:

- Train model
- Face recognition
- Add students
- Add users
- Can sort data
- Can view attendance of students

5.6 PRODUCT EXPERIENCE:

- Comfortable
- Satisfied
- Saved Time

5.7 CUSTOMER REVALIDATION:

- Add feature to access data from anywhere

5.8 REJECT, REDESIGN, And RETAIN:

- Website or app to access the data from anywhere

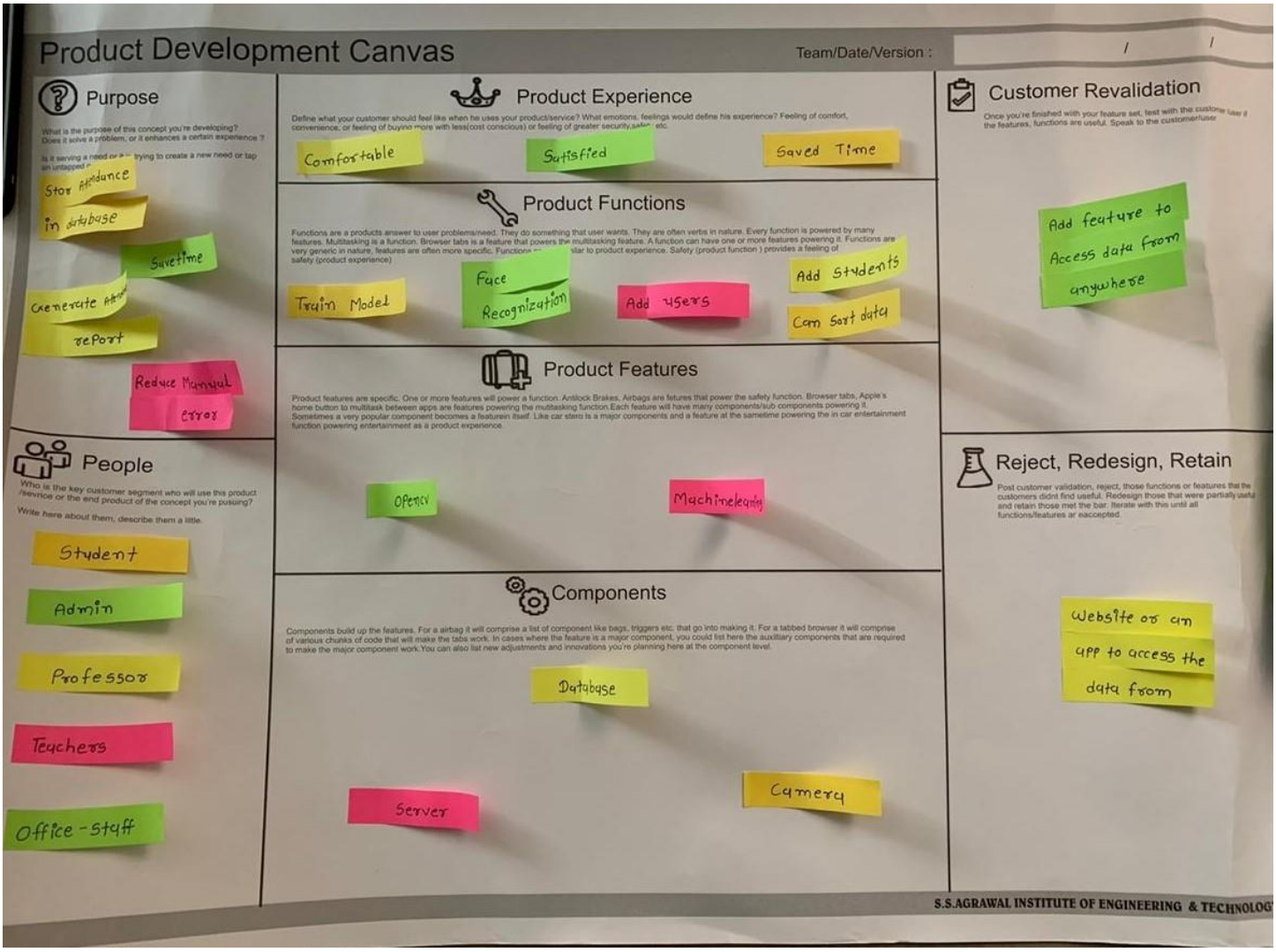


Figure. PRODUCT DEVELOPMENT CANVAS

6. Summary of Prior Art Search

- Biometric Authentication: A Review by Debnath Bhattacharyya, Rahul Ranjan, Farkhod Alisherov A, Minkyu Choi presents a review on the biometric authentication techniques and some future possibilities in field.
- Face detection & face recognition using open computer vision classifiers by Lahiru Dinalankara.
- It explains the technologies used in the project and the methodology used. Finally, it shows the results, discuss the challenges and how they were resolved followed by a discussion. Using Haar-cascades for face detection worked extremely well even when subjects wore spectacles. Real time video speed was satisfactory as well devoid of noticeable frame lag. Considering all factors, LBPH combined with Haar-cascades can be implemented as a cost effective face recognition platform. An example is a system to identify known troublemakers in a mall or a supermarket to provide the owner a warning to keep him alert or for automatic attendance taking in a college or school.
- There are many free source projects available on GitHub, many other platforms for face capturing attendance storing system and 70% are CLI (command Line Interface), 20% are web based and 10% are GUI (Graphical user interface).
- CLI's are very not user friendly, GUI system are having very less functionalities, web-based system is not safe as the data of institute is stored on server which can be anywhere in city and can be hacked easily.
- AI powered attendance capturing system is software built in python using Tkinter tool and database; MySQL, and system is connected with institute’s server via LAN.

7. Learning Needs Matrix (LNM):

The LNM is containing a quadratic layout. The purpose of LNM is to identify the requirements of learning. While a new product/process is under development based on a unique idea, the need to learn and explore a lot of new skills and documents, methods and guidelines.

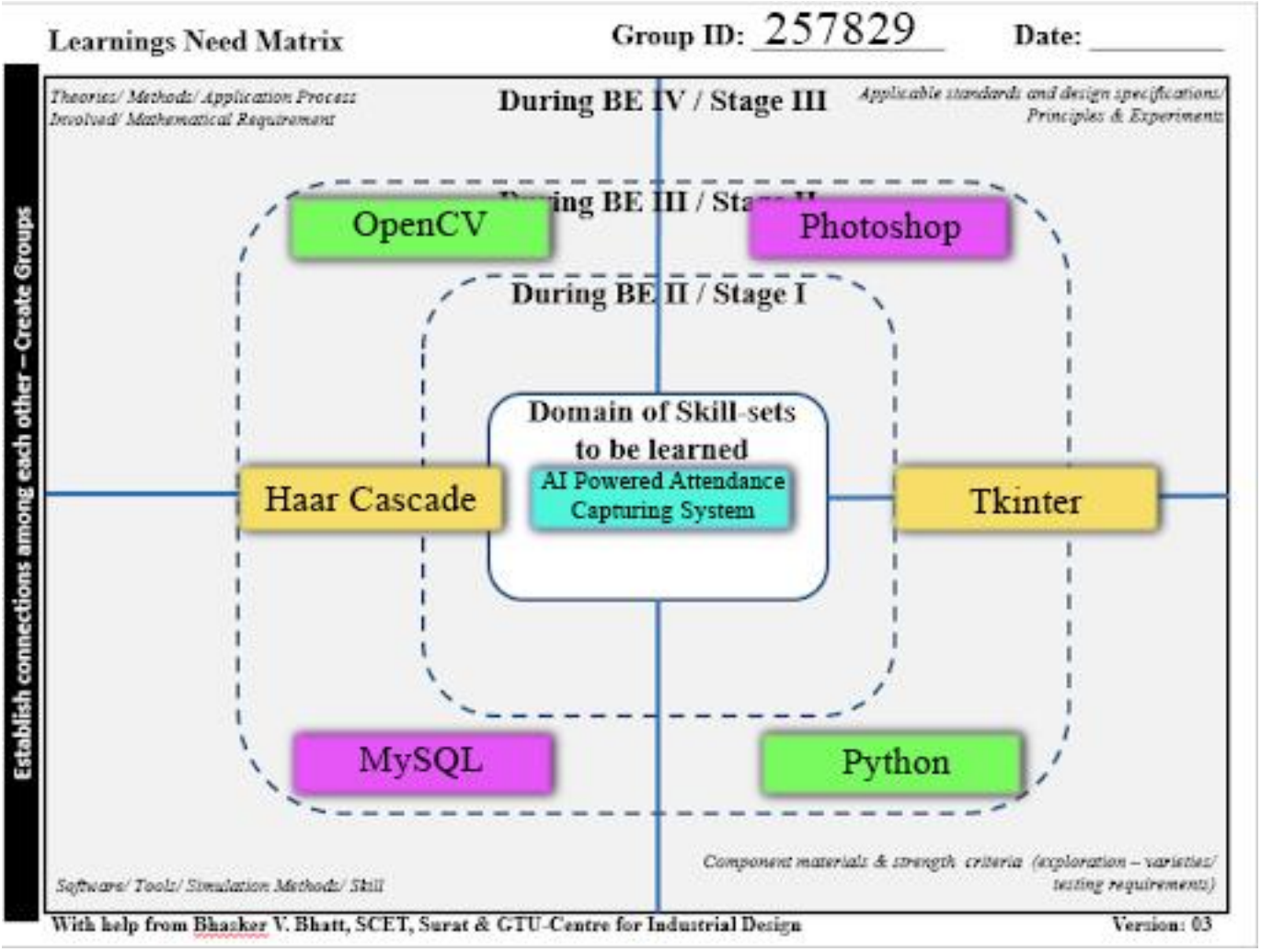


Figure. Learning Needs Matrix (LNM) CANVAS

8. PROTOTYPE:

INTRODUCTION: -

- A prototype is an operating version of a solution. It is often made with different materials than version.
- Prototypes allow you to test how your solution will work and even show the solution to users for feedback.
- Creating prototype may involve using readily available materials, construction kits, storyboards, or other techniques that help you to create your solution quickly and with little cost.

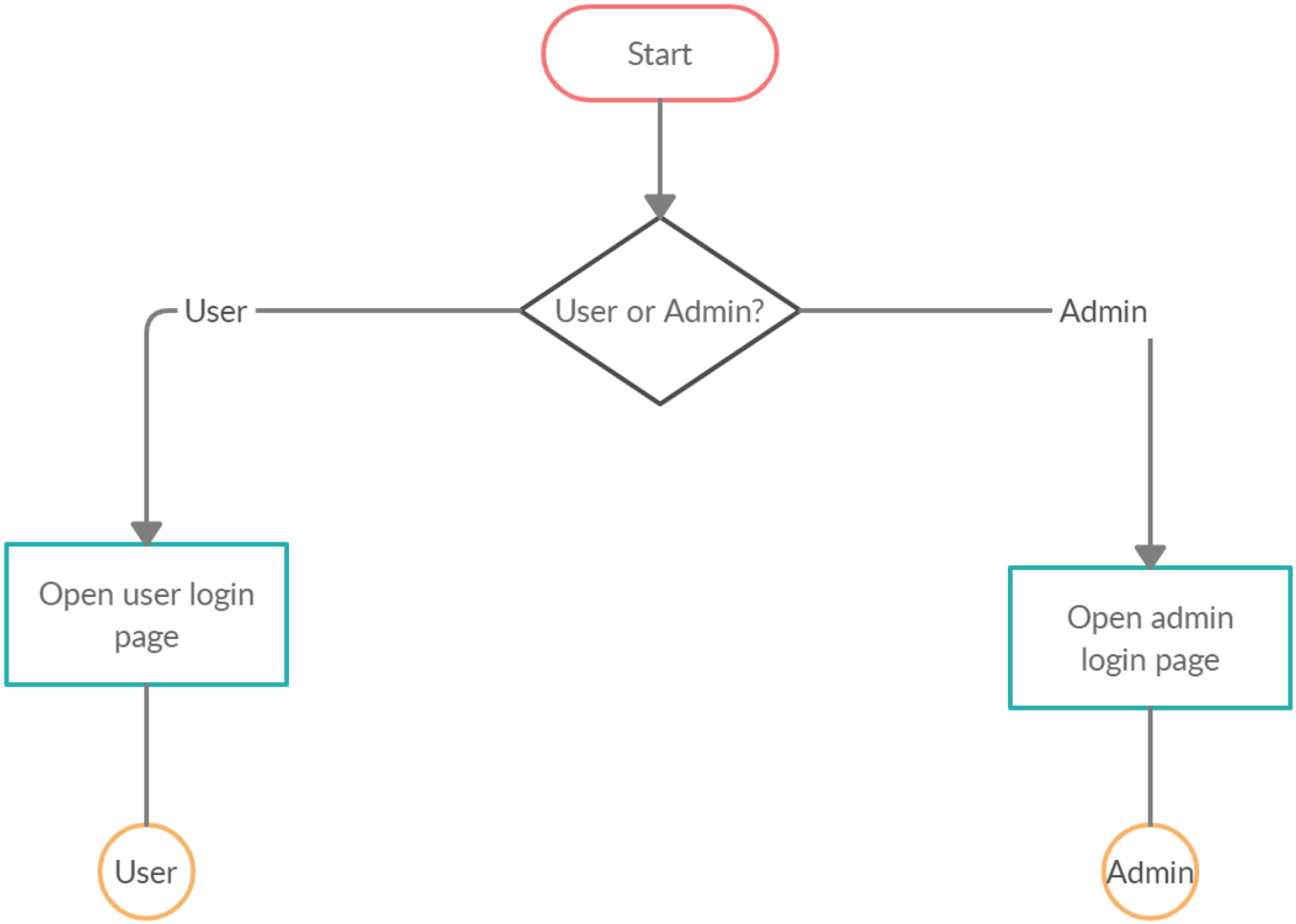


Figure. Main Flow

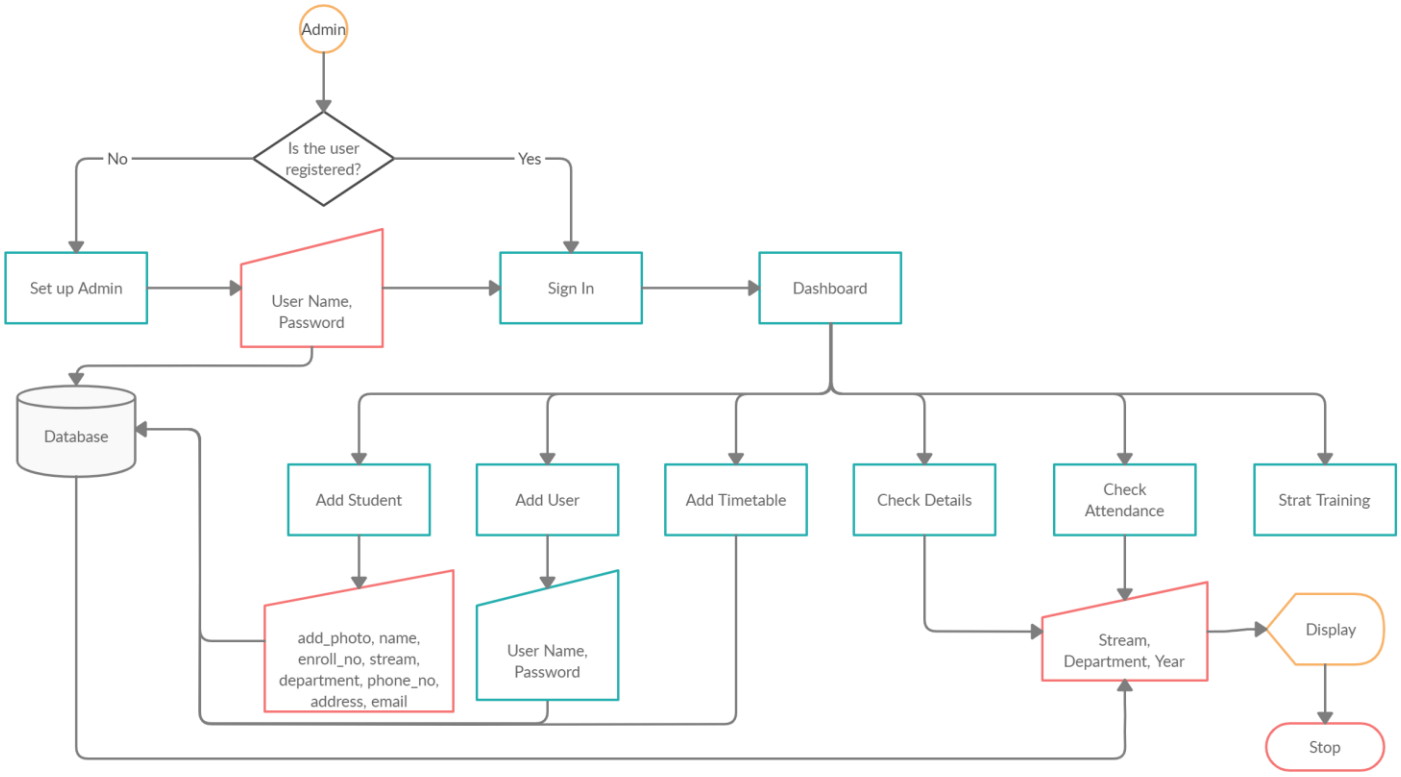


Figure. Admin Flow

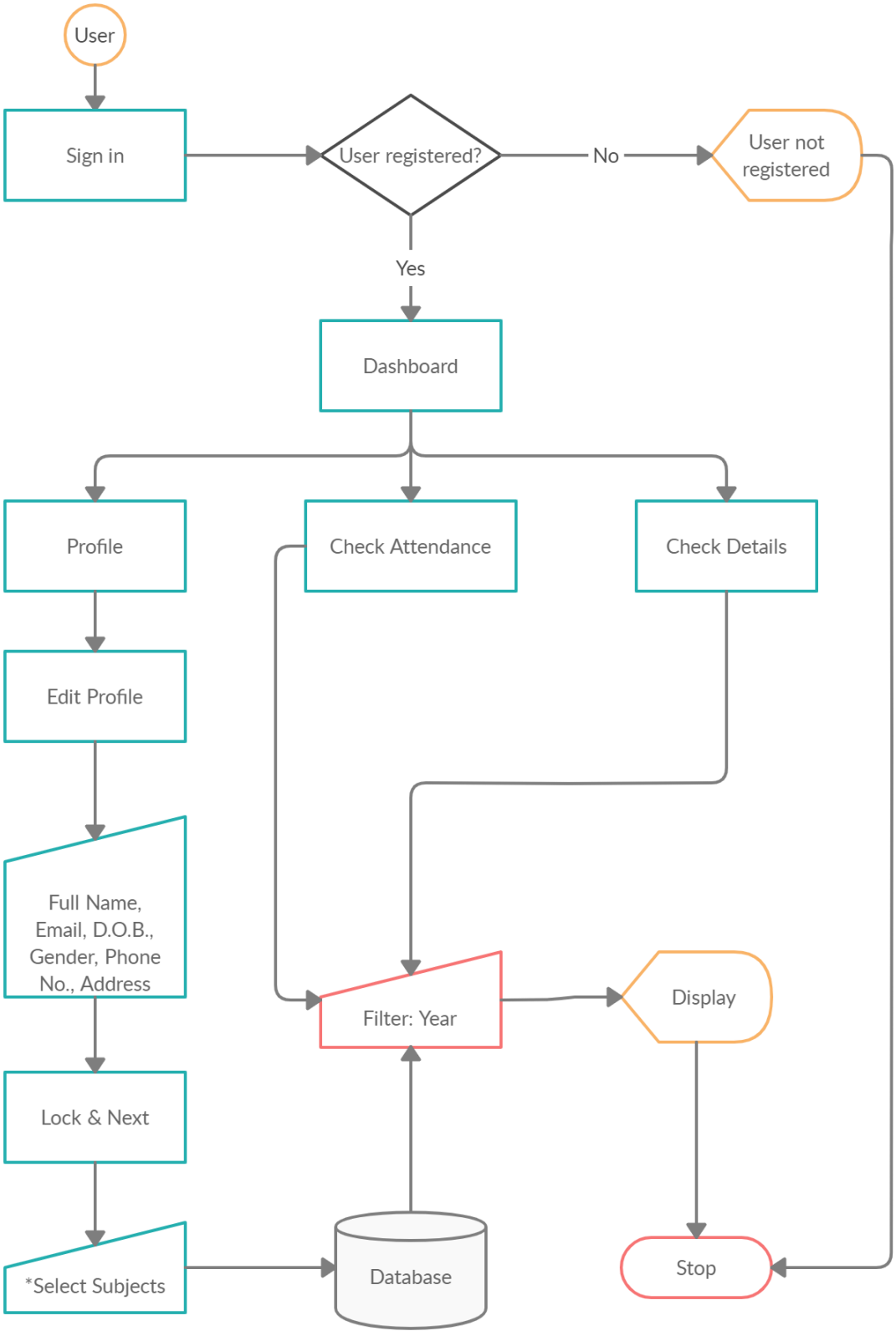


Figure. User Flow

9. Existing System

RFID:

RFID uses electromagnetic field to identify and track code attach to the card. An RFID tag consists of a tiny radio transponder; a radio receiver and transmitter. When triggered by an electromagnetic interrogation pulse from a nearby RFID reader device, the tag transmits digital data, usually an identifying inventory number, back to the reader. This number can be used to track inventory goods.

Problem with RFID:

- Materials like metal & liquid can impact signal
- Sometimes not as accurate or reliable.
- Implementation can be difficult & time consuming.
- Anyone can misuse it by using someone else's card.

Biometric Scan:

A biometric device is a security identification and authentication device. Such devices use automated methods of verifying or recognizing the identity of a living person based on a physiological or behavioral characteristic. These characteristics include fingerprints, facial images, iris and voice recognition.

Problem with Biometric Scan:

- Biometric fails if the finger is ruptured/wet.
- Significant investment needed in biometrics for security.
- Biometric databases can still be hacked.

10. Proposed Solution

- Computer + ML + camera = Automated Attendance Capturing System
- While RFID can be affected by metal or liquid our system doesn't require any sort of a card or ID which should be scanned before entering the class or office. Our system automatically detects and captures the faces of students or workers while they are entering the class or office respectively. Which can also save time as they don't have to stand in queue while their attendance is being registered. RFID is not as secure as our system as in RFID anyone can scan the RFID card of some other person, while our system accurately detect and then only will mark the attendance.
- Biometric finger scan fails if the finger in wet or ruptured as it can avoid the scanner to recognize the person scanning their finger, while our system doesn't require any finger to be scanned it only needs the face of the person and if the person's face is available in the database then only it will detect and mark the attendance otherwise it will ignore the face.
- Biometric face scanning system is already available in the market then, how is our system different from other system on internet?
  1. GUI is user friendly; user don't need any technical knowledge to access the feature.
  2. As compared to system on internet many more functions are given for admin and user.
  3. The data security is maintained, data can be changed only by admin and only read access is given to user.

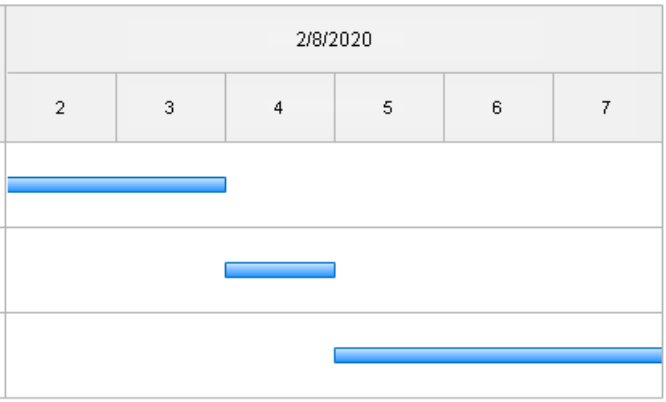
11. Future Plans

- Website or app to access the data anywhere.
- Keep the parents informed about students' performance via Email & SMS alerts
- Auto generate report for entire semester.

12. Gantt Chart

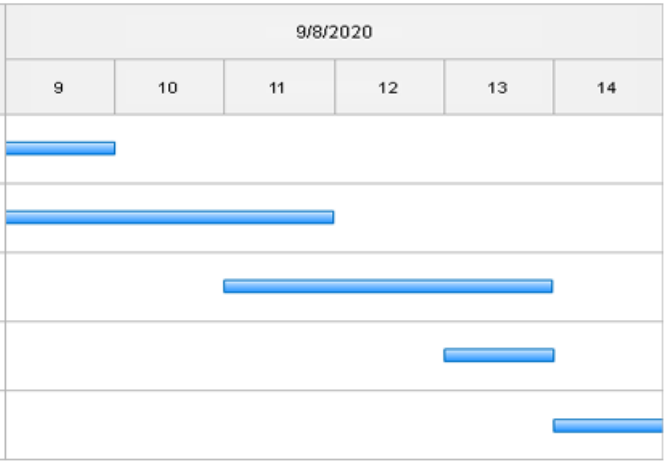
Week 1

ID	Task Name	Start	Finish	Duration
1	Decide Project Name & Functionality	2/8/2020	3/8/2020	2.0 d.
2	Dicuss Project with internal guide	4/8/2020	4/8/2020	1.0 d.
3	Make system flow diagram	5/8/2020	7/8/2020	3.0 d.



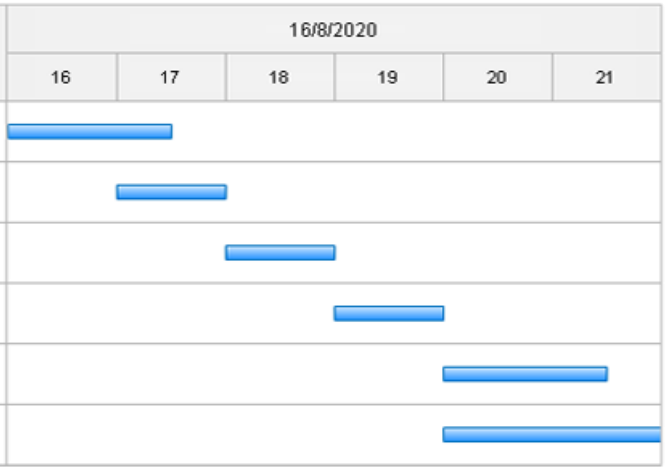
Week 2

ID	Task Name	Start	Finish	Duration
1	data flow diagram	9/8/2020	9/8/2020	1.0 d.
2	UML diagram	9/8/2020	11/8/2020	3.0 d.
3	ER diagram	11/8/2020	13/8/2020	3.0 d.
4	AEIOU Canvas points	13/8/2020	13/8/2020	1.0 d.
5	Empathy Canvas points	14/8/2020	14/8/2020	1.0 d.



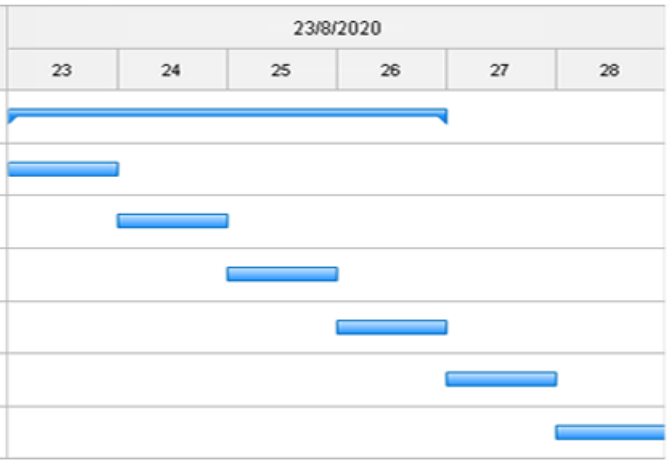
Week 3

ID	Task Name	Start	Finish	Duration
1	Ideation Canvas points	16/8/2020	17/8/2020	1.5 d.
2	MindMap Canvas points	17/8/2020	17/8/2020	1.0 d.
3	discuss canvas points with Internal Guide	18/8/2020	18/8/2020	1.0 d.
4	Change in Empathy Canvas points	19/8/2020	19/8/2020	1.0 d.
5	design homepage	20/8/2020	21/8/2020	1.5 d.
6	design login form	20/8/2020	21/8/2020	2.0 d.



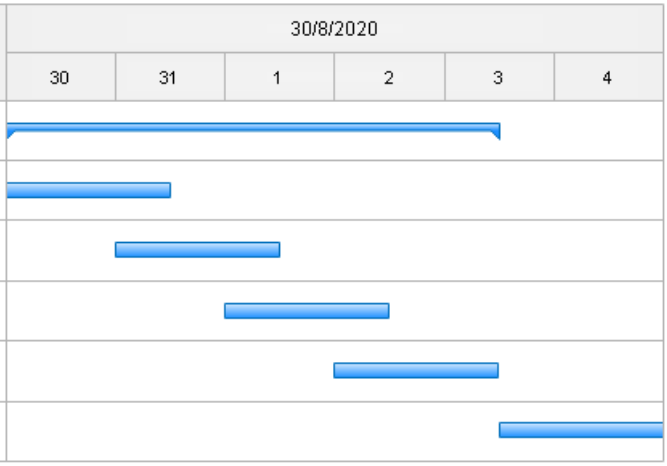
Week 4

ID	Task Name	Start	Finish	Duration
1	⊟ design Admin page	23/8/2020	26/8/2020	4.0 d.
2	design add users tab	23/8/2020	23/8/2020	1.0 d.
3	design add students tab	24/8/2020	24/8/2020	1.0 d.
4	design check detail tab	25/8/2020	25/8/2020	1.0 d.
5	design attendance tab	26/8/2020	26/8/2020	1.0 d.
6	coding for homepage	27/8/2020	27/8/2020	1.0 d.
7	coding for login form	28/8/2020	28/8/2020	1.0 d.



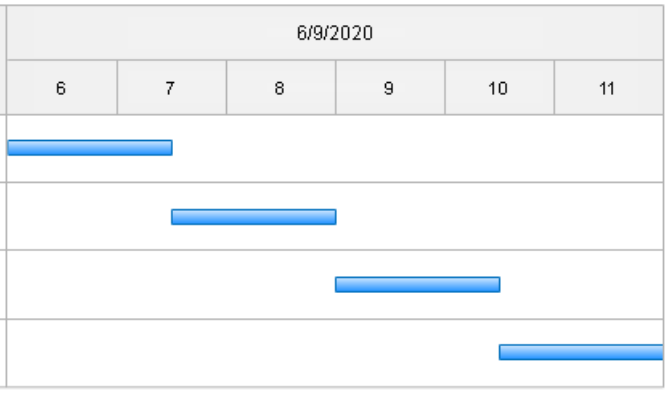
Week 5

ID	Task Name	Start	Finish	Duration
1	⊟ coding for admin page	30/8/2020	3/9/2020	4.5 d.
2	coding add users tab	30/8/2020	31/8/2020	1.5 d.
3	coding add students tab	31/8/2020	1/9/2020	1.5 d.
4	coding check detail tab	1/9/2020	2/9/2020	1.5 d.
5	coding attendance tab	2/9/2020	3/9/2020	1.5 d.
6	design database table	3/9/2020	4/9/2020	1.5 d.



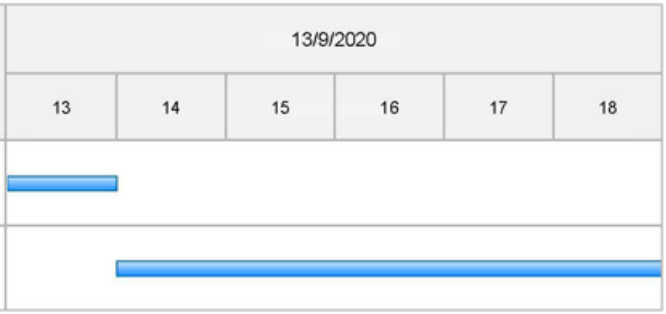
Week 6

ID	Task Name	Start	Finish	Duration
1	connect add users tab with database	6/9/2020	7/9/2020	1.5 d.
2	connect add students tab with database	7/9/2020	8/9/2020	1.5 d.
3	connect check details tab with database	9/9/2020	10/9/2020	1.5 d.
4	connect login form with database	10/9/2020	11/9/2020	1.5 d.



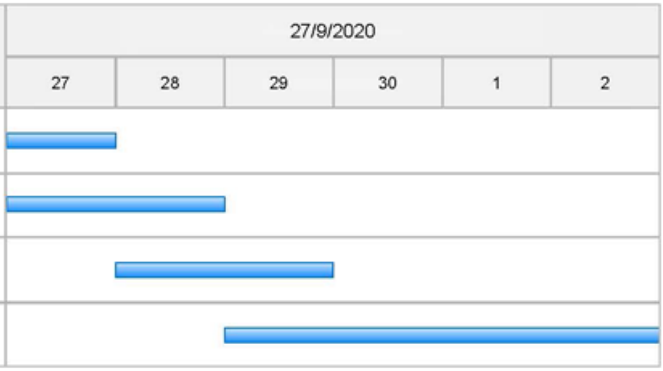
Week 7

ID	Task Name	Start	Finish	Duration
1	AEIOU Canvas DONE	13/9/2020	13/9/2020	1.0 d.
2	Session Feature Added in System	14/9/2020	18/9/2020	5.0 d.



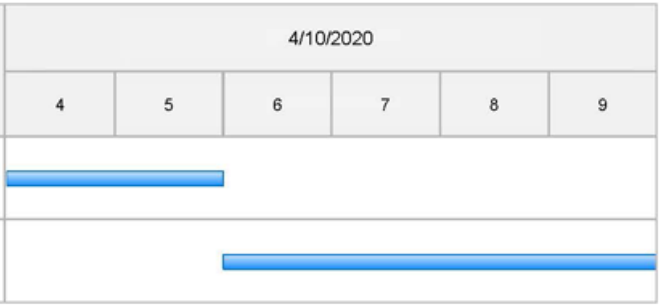
Week 8

ID	Task Name	Start	Finish	Duration
1	Profile png added for profile btn	27/9/2020	27/9/2020	1.0 d.
2	Final design admin/ check attendace page	27/9/2020	28/9/2020	2.0 d.
3	design user/ profile page	28/9/2020	29/9/2020	2.0 d.
4	coding for user/ profile page	29/9/2020	2/10/2020	4.0 d.



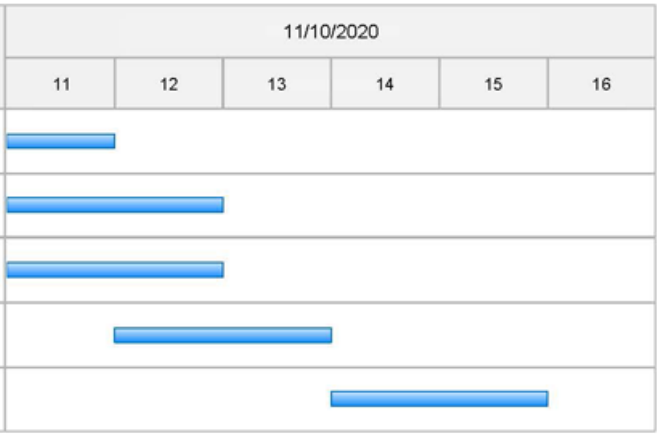
Week 9

ID	Task Name	Start	Finish	Duration
1	coding for admin/ check attendance page	4/10/2020	5/10/2020	2.0 d.
2	Testing of admin Page	6/10/2020	10/10/2020	5.0 d.



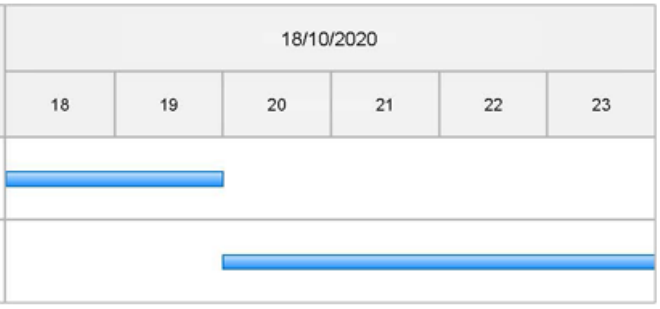
Week 10

ID	Task Name	Start	Finish	Duration
1	Empathy Canvas Done	11/10/2020	11/10/2020	1.0 d.
2	fixed bug in admin Page	11/10/2020	12/10/2020	2.0 d.
3	fixed bug in user Page	11/10/2020	12/10/2020	2.0 d.
4	Project Report Planning	12/10/2020	13/10/2020	2.0 d.
5	Project PPT planning	14/10/2020	15/10/2020	2.0 d.



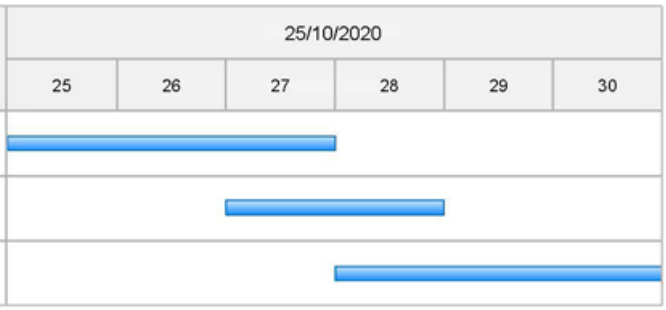
Week 11

ID	Task Name	Start	Finish	Duration
1	MindMap Canvas done	18/10/2020	19/10/2020	2.0 d.
2	Ideation Canvas done	20/10/2020	24/10/2020	5.0 d.



Week 12

ID	Task Name	Start	Finish	Duration
1	Prototype Canvas Done	25/10/2020	27/10/2020	3.0 d.
2	PDC Canvas Done	27/10/2020	28/10/2020	2.0 d.
3	LNM Canvas Done	28/10/2020	30/10/2020	3.0 d.



Week 13

ID	Task Name	Start	Finish	Duration	1/11/2020					
					1	2	3	4	5	6
1	Changes in Canvas	1/11/2020	2/11/2020	2.0 d.						
2	PPT Done	2/11/2020	6/11/2020	5.0 d.						

Week 14

ID	Task Name	Start	Finish	Duration	8/11/2020					
					8	9	10	11	12	13
1	Report Done	8/11/2020	10/11/2020	3.0 d.						

13. Reference

- https://github.com/kmhmubin/Face-Recognition-Attendance-System
- https://github.com/thuyngch/Face-Attendance-System
- https://github.com/rishabh-karmakar/Facial-Recognition-Based-Attendance-System
- https://www.researchgate.net/publication/46189709_Biometric_Authentication_A_Review
- https://sites.cs.ucsb.edu/~mturk/Papers/mturk-CVPR91.pdf
- https://docs.python.org/3/
- https://docs.python.org/3/library/tkinter.html
- https://stackoverflow.com/
- https://icons8.com/icons/

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What is Design Thinking? Design thinking is a method used by engineers as well as designers to solve complex problems for users and clients. Design thinking is based upon logic, imagination, institution and systematic reasoning to explore possibilities of what could be created and outcome that benefit to the user at the end. 1.2 Empathy Mapping: 1.3 Observation through AEIOU & Other Method: Domain: AI Powered Attendance Capturing System We have chosen AI Powered Attendance Capturing System as our domain, because while taking attendance manually takes time. So, by implementing this system will save time in classroom and will automatically update the student's attendance automatically in database. 1.4 Role Playing: All of our group members took their time to check which camera implementation will be perfect for our system and which camera will best fit for this system. Our team also took a deep dive for which language and framework will be used for facial recognition. 1.5 Mind Mapping: Figure: Mind mapping canvas 2. AEIOU Our group's area of interest is to determine the problem of the AI Powered Attendance Capturing System. 2.1 AEIOU: • Activities • Environment • Interaction • Objects • Users 2.2 Activities: ? Capturing photo ? Recognizing faces ? Add new student/user ? Delete new student/user ? Filling Attendance 2.3 ENVIRONMENT: During empathy mapping the factors of the environment are very crucial and must be taken in to consideration. ? Noisy ? Crowdy ? Warm ? Cool 2.4 INTERACTION: ? Camera – Student's Face ? Computer – Camera ? Computer – Database ? Administrator - Software 2.5 OBJECTS: ? Camera ? Computer ? Internet ? Images 2.6 USERS: ? Students ? Admin ? Professor ? Teachers ? Manager ? Office Staff Figure. AEIOU CANVAS Based on this observation of AEIOU we come to know about the various parameters to decide the problem of AI Powered Attendance Capturing System. By these entire observations, we came to know about various objects, peoples involved in the activities of AI Powered Attendance Capturing System. By observing the entire problem, we divided the problems in different parts so we can find the solution in systematically order. 3. EMPATHY MAPPING 3.1 USER FOR EMPATHY MAPPING: ? Students ? Professors ? Teacher ? Manager ? Office Staff 3.2 STAKEHOLDERS: ? Students ? Faculty ? Office Staff 3.2 ACTIVITIES: ? Capturing Photo ? Recognizing faces ? Filling attendance 3.4 STORIES BOARDING: HAPPY: 15 minutes were wasted in lecture for taking attendance, but after implementation of this system teacher can utilize whole lecture. SAD: A student always used to arrive late at college but still managed to get his attendance filled, but after the implementation of this system he never got his attendance filled after coming late. HAPPY: Manual Attendance generated few errors due to disturbance in class, but after implementation of this system, results got accurate. SAD: Power cut results server to shut down due to this our system fails and manual attendance have to be taken. Figure. EMPATHY CANVAS 4. IDEATION CANVAS Our group makes ideation canvas for the domain AI Powered Attendance Capturing System. 4.1 The following people are involved in AI Powered Attendance Capturing System: • Students • Teachers • Staff • Professors 4.2 Situation/Contexts/Location: - • During Lectures - Attendance – College • RFID card lost • Injury in finger - Biometric method fail • Rainy - Biometric method fail 4.3 ACTIVITIES: • Manually Taking Attendance • Attendance Through Biometric Method • Attendance Through RFID Method 4.4 PROPS/POSSIBLE SOLUTIONS: • Computer + ML + camera = Automated Attendance Capturing System 5. PRODUCT

attendance of students 5.6 PRODUCT EXPERIENCE: 5.7 CUSTOMER REVALIDATION: 5.8 REJECT, REDESIGN, And RETAIN: Figure. PRODUCT DEVELOPMENT CANVAS 6. Summary of Prior Art Search • There are many free source projects available on GitHub, many other platforms for face capturing attendance storing system and 70% are CLI (command Line Interface), 20% are web based and 10% are GUI (Graphical user interface). • CLI's are very not user friendly, GUI system are having very less functionalities, web-based system is not safe as the data of institute is stored on server which can be anywhere in city and can be hacked easily. • AI powered attendance capturing system is software built in python using Tkinter tool and database; MySQL, and system is connected with institute's server via LAN. • How is our system different from other system on internet? 1. GUI is user friendly; user don't need any technical knowledge to access the feature. 2. As compared to system on internet many more functions are given for admin and user. 3. The data security is maintained, data can be changed only by admin and only read access is given to user. The LNM is containing a quadratic layout. The purpose of LNM is to identify the requirements of learning. While a new product/process is under development based on a unique idea, the need to learn and explore a lot of new skills and documents, methods and guidelines. 8. PROTOTYPE: INTRODUCTION: - ? A prototype is an operating version of a solution. It is often made with different materials than version. ? Prototypes allow you to test how your solution will work and even show the solution to users for feedback. ? Creating a prototype may involve using readily available materials, construction kits, storyboards, or other techniques that help you to create your solution quickly and with little cost.

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Title: Learnings Need Matrix (LNM)

the purpose of lnm is to identify the requirements of learning among the team members.the lnm is containing a quadratic layout. from centre (the concept under development), it needs to have mention of learning/exploring requirements in each quadrant representing a specific type of skill...