

A
Project Report On
E-Attendance
(Attendance Management System)

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CERTIFICATE

This is to certify that the practical/term work carried out in the subject of **Software Design Project** and recorded in this journal is the bonafide work of

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Theoretical knowledge is of no importance if one doesn't know the way of its implementation. We are thankful to our institute that provided us an opportunity to apply our theoretical knowledge through the project. We feel obliged in submitting this project as part of our curriculum.

We would like to take the opportunity to express our humble gratitude to our guide **Prof. Apurva A Mehta**, under whom we undertook our project. His constant guidance and willingness to share his vast knowledge made us enhance our knowledge and helped us to complete the assigned tasks to perfection. Without his effort, support and an astonishing testing ability this project may not have succeeded.

With Sincere Regards,
Harshit
Saloni

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Abstract

We are planning to develop an online attendance management System. As we know faculties need to take attendance manually in sheets and it consumes time so we are coming up with an approach in which teachers can create required blocks in application. All related students have QR code and there must be one system which can scan the QR code of the Students. After scanning the QR code, student's attendance will be marked and that will be shown to the faculty who created that block as well as the student. Teachers can see attendance reports as well. This will be the mobile application and for that we will use Flutter framework.

Main goal of this project is to reduce the time consuming to take attendance by passing sheets to students and sometimes the process of attendance may be error prone and tedious also. So we want such applications that reduce such errors.

1.2 Scope

This application is only limited to any specific university or school or organization.

1. Introduction

Now a days taking attendance manually is a tedious and time consuming process. So our goal is to reduce overhead of faculties and students by making an android application, in which student and faculty added by admin of the department. Faculty can generate new events and add set of students in it. Students can also see those events. For attendance students have to generate QR code and faculty will scan it for take attendance.

2.1 Technology Used:

- Dart
- Flutter framework
- Firebase

2.2 Platform Used:

- Visual Studio Code

2. Software Requirement Specification

2.1 Admin

2.1.1 Login

Input: Credential

Output: Home screen

Process: After filling up login details the system will check in the database for users if not found then error messages will be displayed.

2.1.2 Add Faculty

Input: Faculty Details

Output: Appropriate message will be displayed.

Process: After filling up all details the system will add details to the database.

2.1.3 Remove Faculty

Input: Select Faculty

Output: Appropriate message will be displayed.

Process: After selecting the faculty system will remove details of faculty from the database.

2.1.4 View Faculty Details

Input: Select Faculty

Output: Details of faculty message will be displayed.

Process: After selecting the faculty system will fetch details of faculty from the database.

2.1.5 Logout

Input: Selection

Output: Authentication screen

Process: After selecting the logout function the system will display an authentication screen.

2.1.6 Add Student

Input: Student Details

Output: Appropriate message will be displayed.

Process: After filling up all details the system will add details to the database.

2.1.7 Remove Student

Input: Select Student

Output: Appropriate message will be displayed.

Process: After selecting the student system will remove details of faculty from the database.

2.1.8 View Student Details

Input: Select Student

Output: Details of student message will be displayed.

Process: After selecting the student system will fetch details of faculty from the database.

2.1.9 Create Batches

Input: Selection of students

Output: List of students

Process: After selecting the students process will save all data in the database

2.2 Faculty

2.2.1 Login

Input: Credential

Output: Home screen

Process: After filling up login details the system will check in the database for users if not found then error messages will be displayed.

2.2.2 Logout

Input: Selection

Output: Authentication screen

Process: After selecting the logout function the system will display an authentication screen.

2.2.3 Generate Event

Input: Details of event

Output: Appropriate message will be displayed.

Process: If the event generated successfully then the system will send QR code to all students which are in particular a batch selected by faculty.

2.2.4 Generate OTP

Input: Button Click

Output: Input Field to enter OTP

Process: OTP will be sent to a student and then it will open one textbox so faculty can enter otp to check the correct one.

2.2.5 Scan QR Code

Input: Button Click

Output: Open camera to scan QR code.

Process: It will wait for QR code and after scanned QR code it will give mark attendance of particular student.

2.3. Student

2.3.1 Login

Input: Credential

Output: Home screen

Process: After filling up login details the system will check in the database for users if not found then error messages will be displayed.

2.3.2 Logout

Input: Selection

Output: Authentication screen

Process: After selecting the logout function the system will display an authentication screen.

2.3.3 Show Event for QR code

Input: Selection of event

Output: Details of event and QR code will be displayed

Process: Student will select a particular event to get the QR code which needs to be scanned by faculty to take his/her attendance.

3. Design

3.1 Use Case Diagram

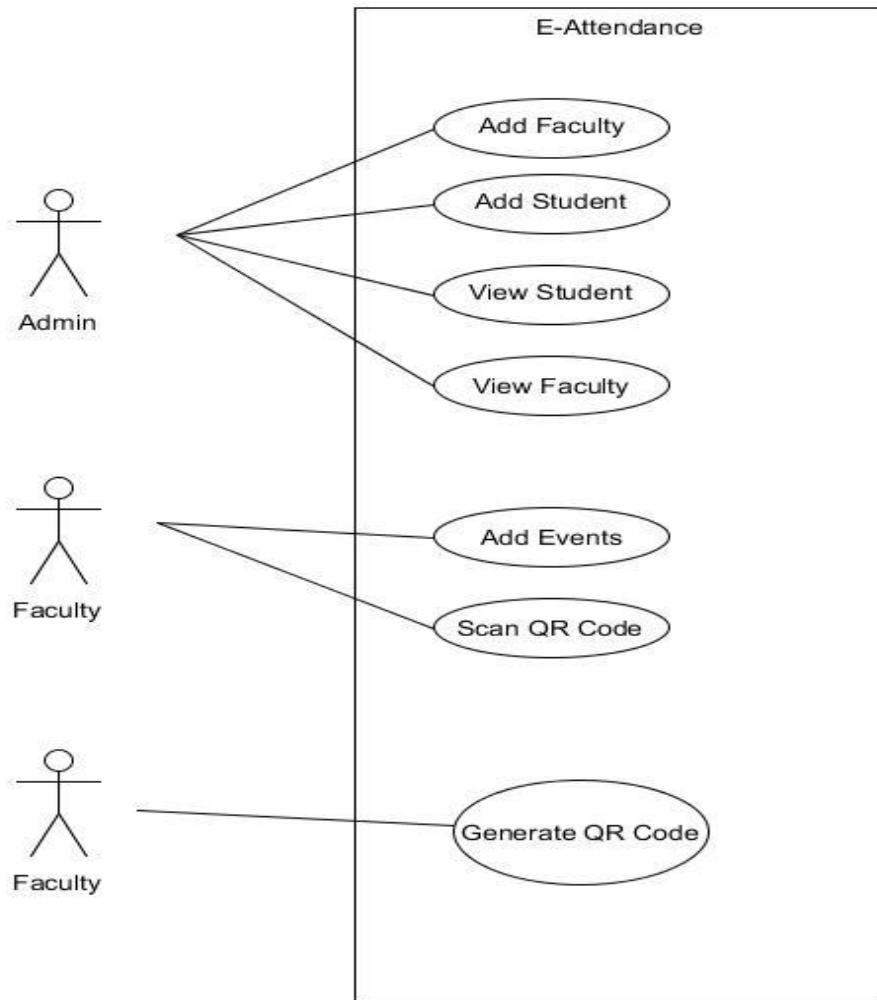


Fig 1: Use case Diagram

3.2 Class Diagram

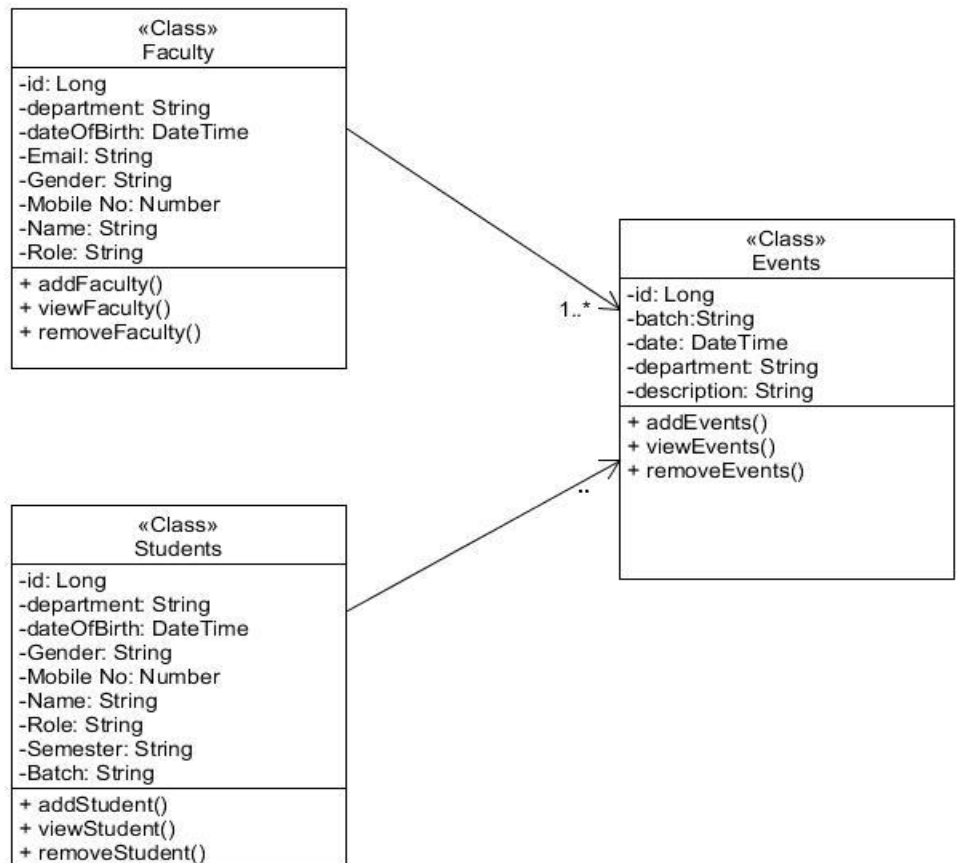


Fig 2: Class Diagram

3.3 Sequence Diagram

➤ Here is a sequence diagram for taking attendance.

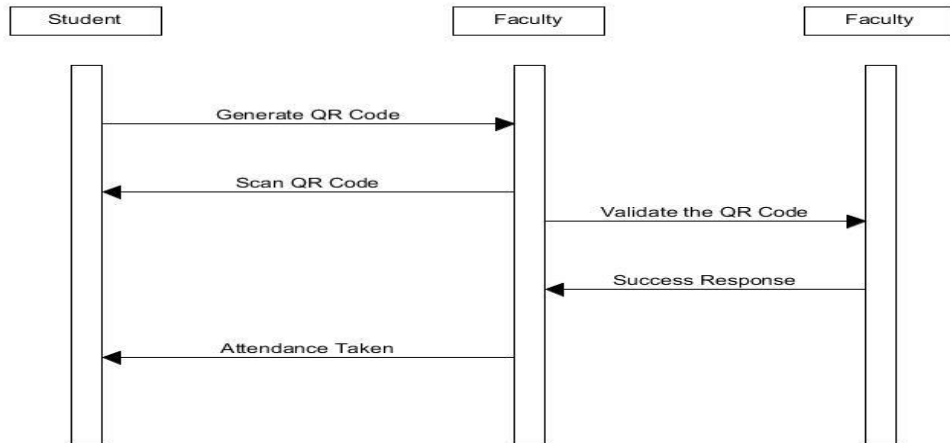


Fig 3: Sequence Diagram

3.4 Activity Diagram

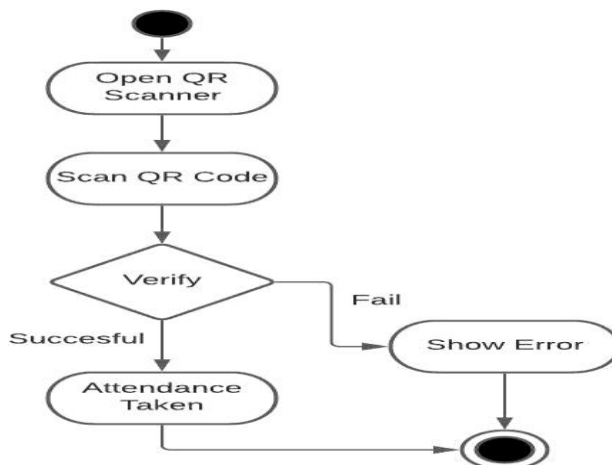


Fig 4: Activity Diagram

3.5 E-R Diagram

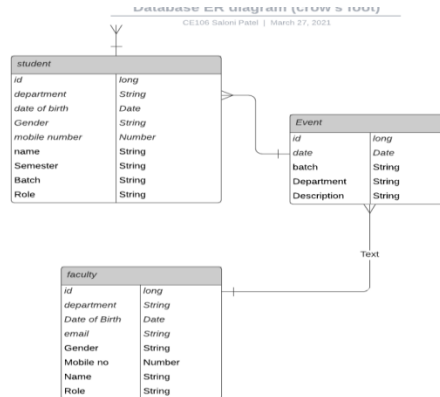


Fig 5: E-R Diagram

3.6 Data Dictionary

3.6.1 Student Table

Field Name	Data Type	Field Length	Constraint	Description
Id	Long	100	Primary Key	Student Id
Department	String	4	-	Department of student
dateOfBirth	DateTime	-	-	Student Birth Date
Gender	String	6	-	Student's gender
MobileNo.	Number	10	-	Student number
Name	String	50	-	Student's name
Batch	String	10	-	Student's batch
Semester	String	10	-	Student's semester
Role	String	10	-	Role in application

3.6.2 Faculty Table

Field Name	Data Type	Field Length	Constraint	Description
Id	Long	100	Primary Key	Faculty Id
Department	String	4	-	Department of faculty
dateOfBirth	DateTime	-	-	Faculty Birth Date
Gender	String	6	-	faculty's gender
MobileNo.	Number	10	-	faculty number
Name	String	50	-	faculty's name
Email	String	50	-	faculty's email
Role	String	10	-	Role in application

3.6.3 Event Table

Field Name	Data Type	Field Length	Constraint	Description
Id	Long	100	Primary Key	Student Id
Department	String	4	-	Event generated by which department
date	DateTime	-	-	Event Date
Description	String	500	-	Event's description
Batch	String	10	-	Event's batch

Fig 6: Data Dictionary

3.7 Flow Chart

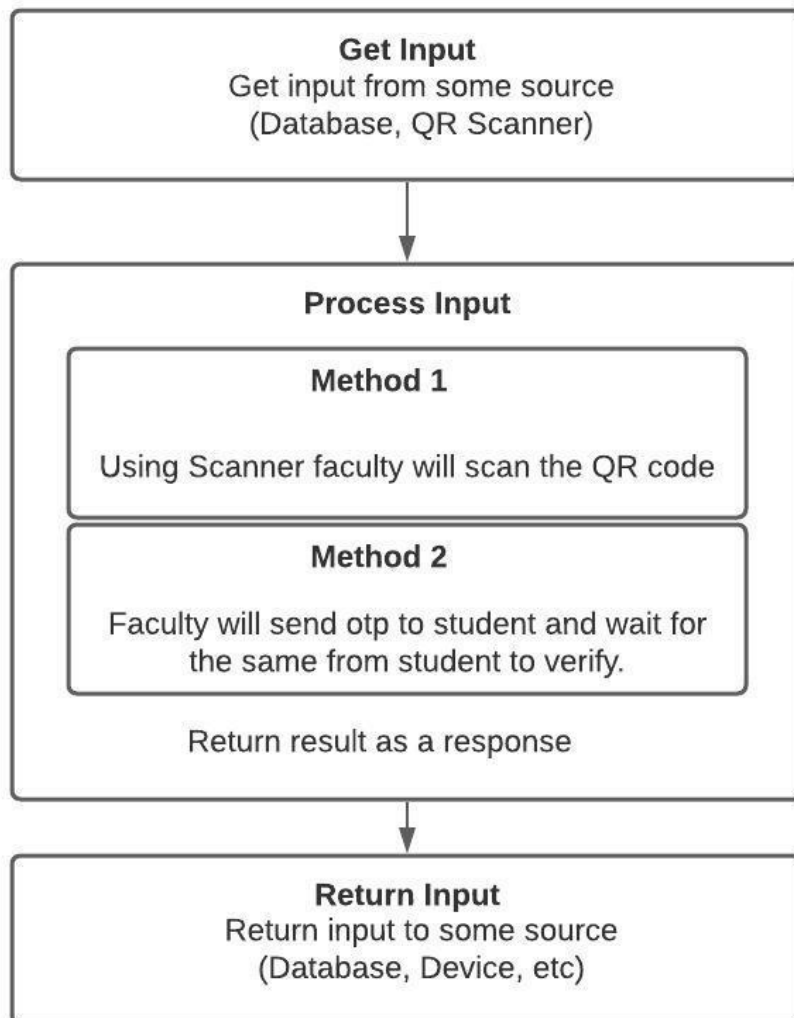


Fig 7: Flow Chart

4. Implementation

We have made the use of Flutter framework and implemented using the dart language.

Flutter Plugins used:

- QR_Flutter
 - It will generate QR code using given data.
- Flutter_barcode_scanner
 - It will scan QR code and return the scanned data.
- Firebase_core
 - To generate instance of firebase.
- Cloud_firestore:
 - It will help in work with firebase cloud firestore for data retrieval and storage.
- Firebase_auth:
 - It will provide services to work with firebase authentication.
- Flutter_otp:
 - It will help to send OTP(One Time Password)

4.1 Modules created and brief description of each modules:

Admin:

The major role of admin is to add students and faculties in the system. Admin can also delete them and update them if required. He can also view list of students and faculties.

Faculty:

- Create an event:
 - Faculty can create new event for a lectures, labs, activities, etc.
 - Faculty can see all the events generated by him/her.
- Scan QR code:
 - Faculty can select particular event and scan QR code given by students. After scanning system will verify if the QR is for particular event or not. If it is valid then attendance will be marked.

- Send OTP:
 - Faculty can send OTP to any student who can't generate QR code due to some issues.

Student:

- View List of event:
 - Students can see all the events in which they are involved.
- Generate QR code:
 - Students have to generate QR code for particular event and give it to faculty member for mark their attendance.

5. Testing

Seq.	Input	Output	Expected Output	Pass/Fail
1	Wrong Login Credential	Error for not matched	Error for not matched	Pass
2	Correct Login Credential	Login Successful	Login Successful	Pass
3	Wrong QR Code	Error Message	Error Message	Pass
4	Wrong OTP	Error Message	Error Message	Pass

6. Screenshots

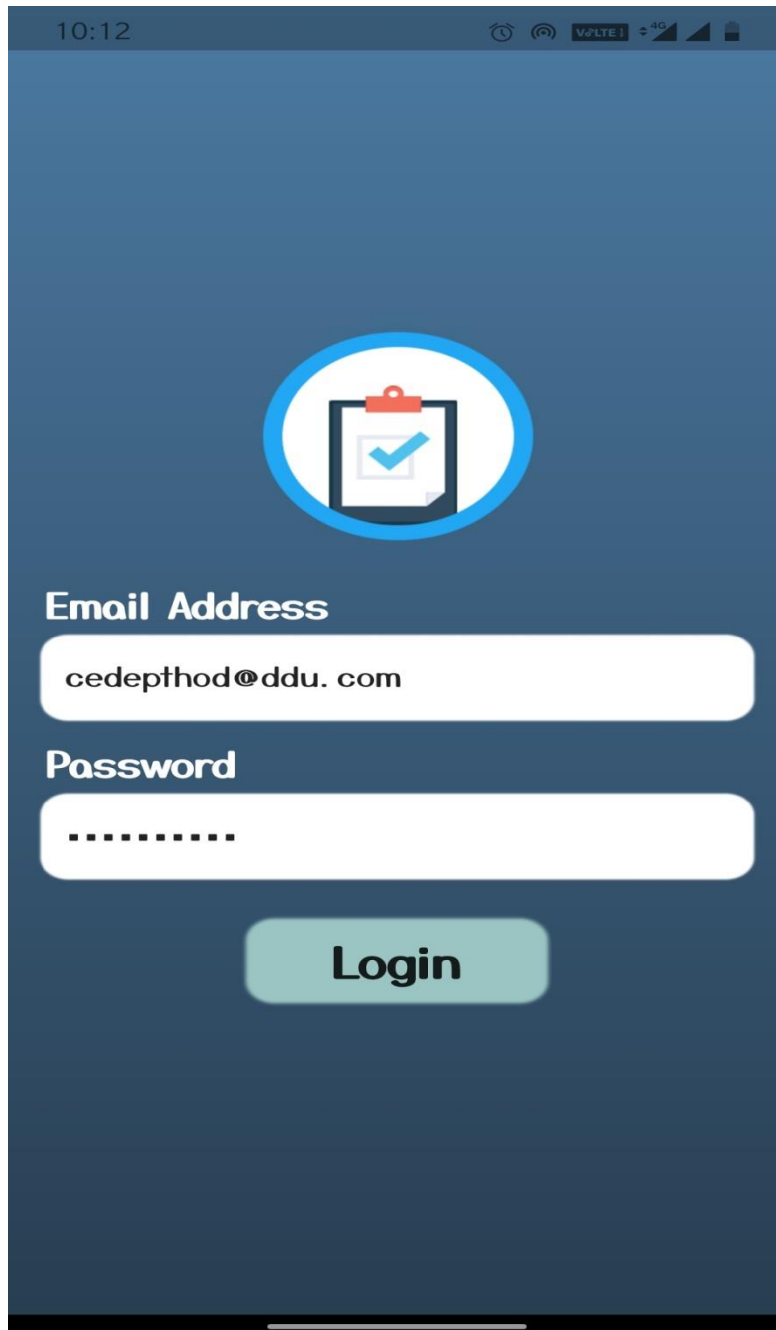


Fig 1: Login Page

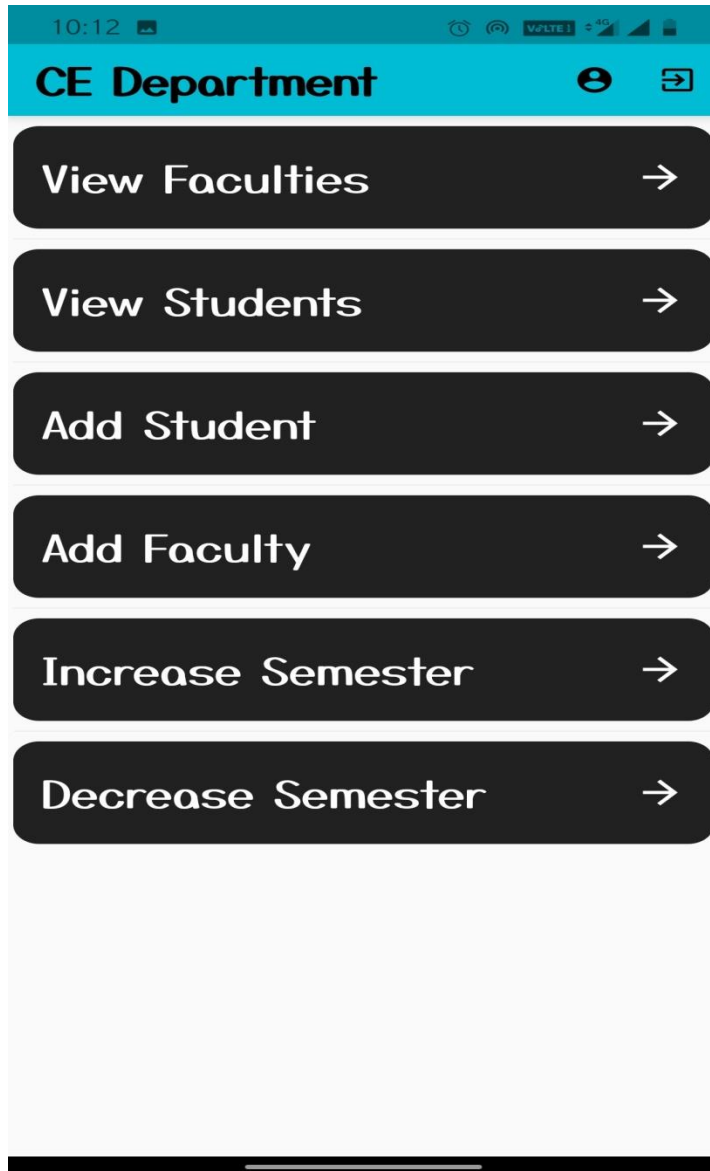


Fig 2: Admin Home Page

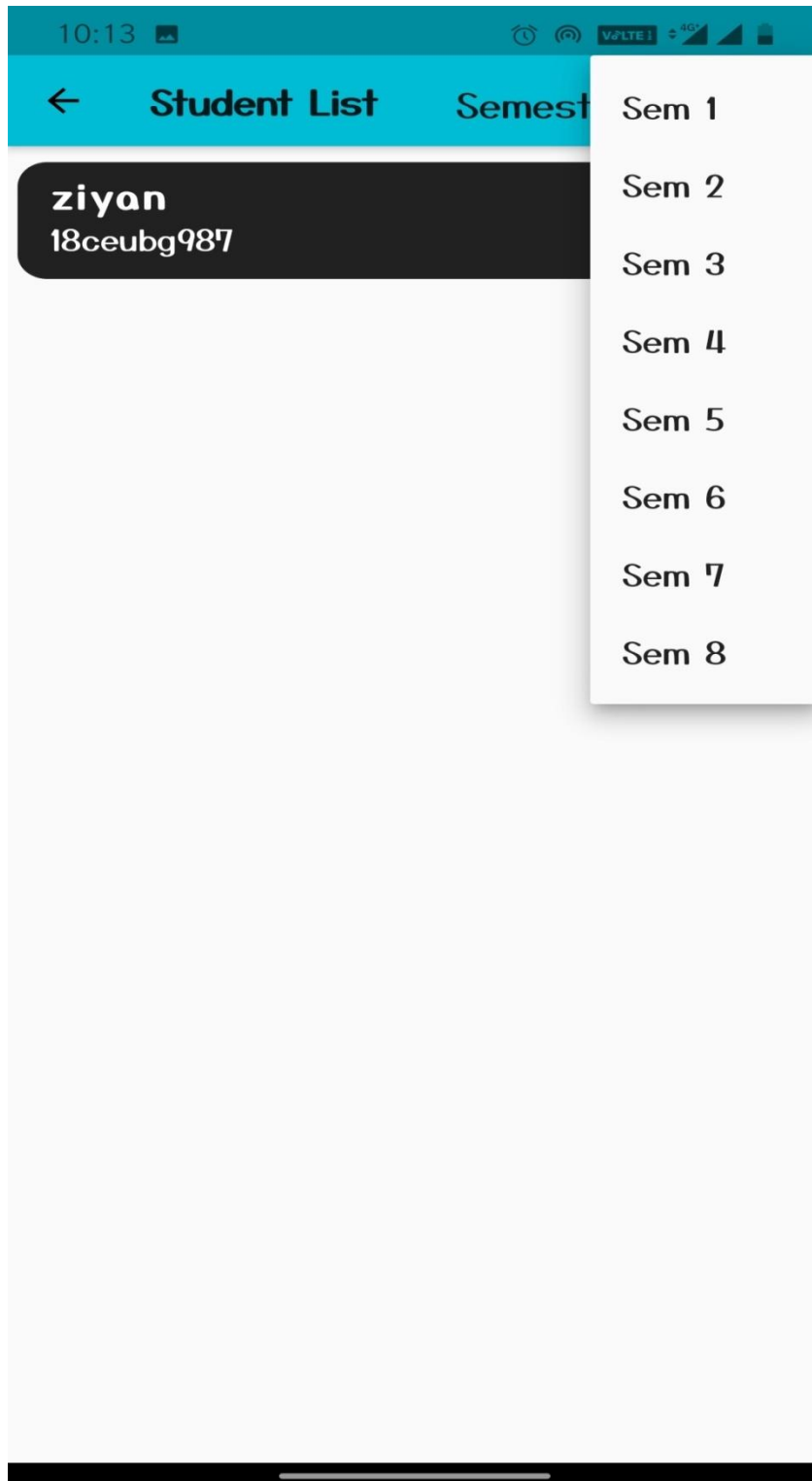


Fig 3: Student List page

10:13

New Student

Name

Student ID

Birth Date

Mobile No.

Gender

☒ Male ☐ Female ☐ Other

Semester **Batch**

Add

Fig 4: Add Student Page



Fig 5: Faculty Home Screen



Fig 6: Event Screen

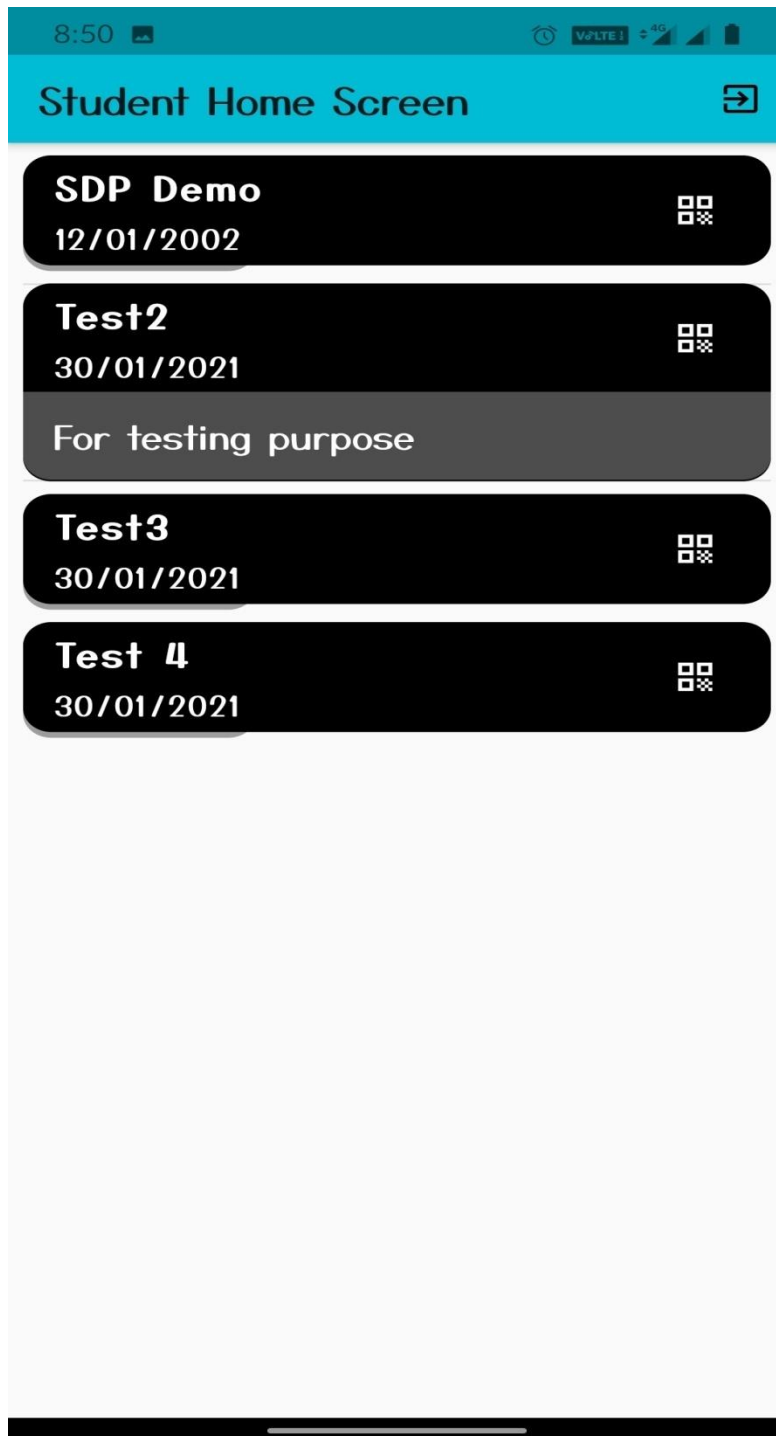


Fig 7: Student Home Screen



Fig 8: QR Code for event

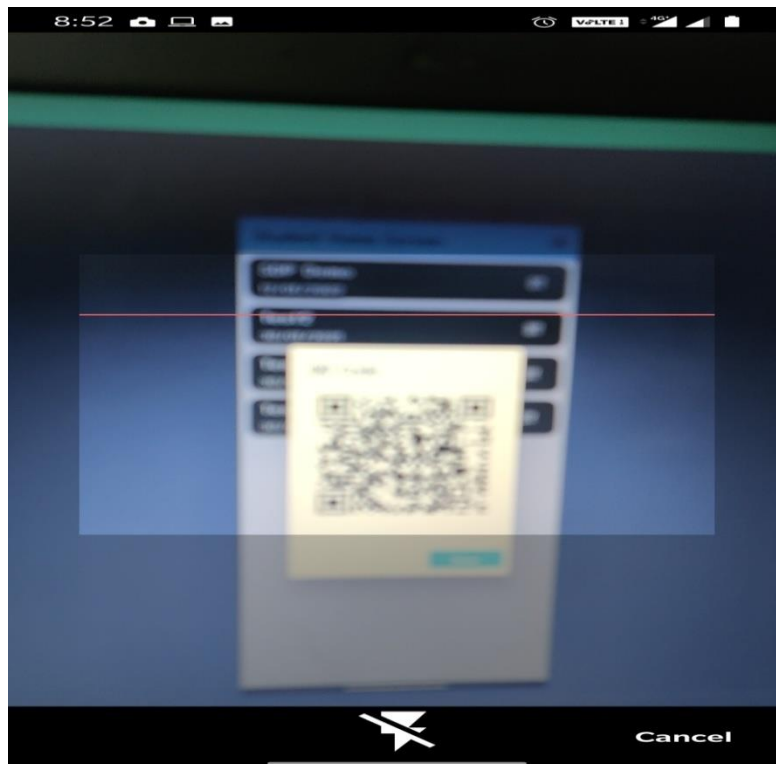


Fig 9: QR Code Scanner

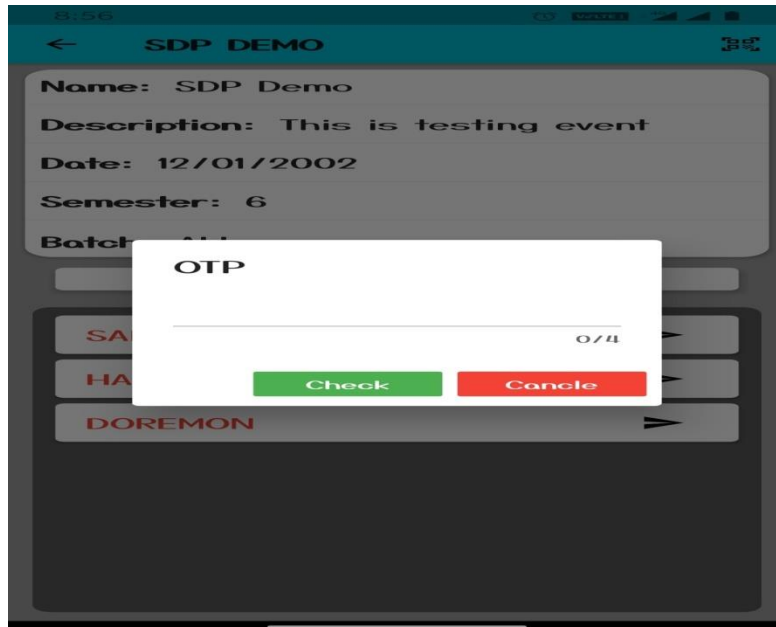


Fig 10: Send OTP Screen

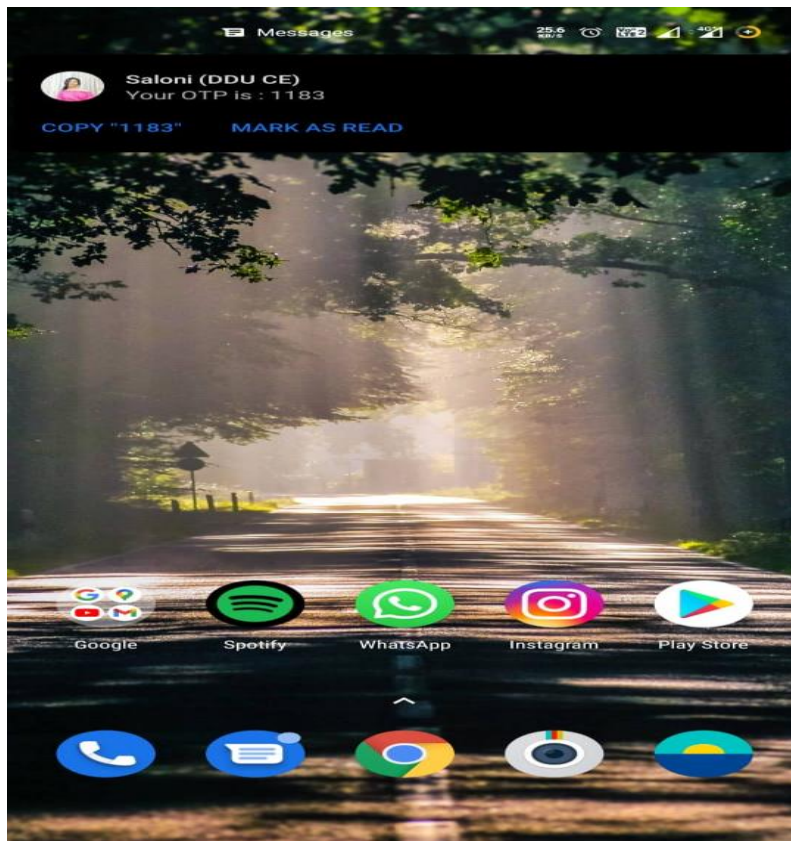


Fig 11: OTP received

7. Conclusion

This project is aimed at developing a complete attendance system for use in the university which will allow the admin to add faculty and student in the system, admin can also update details and delete them and also they can increase and decrease semester of the student instead of manually updating particular students. Faculty can generate new events so respective students will be added to that event. Student can see all events in which faculty enrolled them and student have to generate QR code for attendance and later faculty can scan QR code given by student.

The main advantage of this system is that it greatly simplifies the taking attendance process for both the faculty and students. The system also greatly lightens the load on the universities.

So, here we conclude that our application is working well.

We have implemented this application by writing code in Dart language. We have used flutter as framework and firebase as database. Our application is running successfully in android.

8. Limitations and Future Extensions

8.2 Limitations

- Faculty have to scan QR code of every students so we can still further improve it by make it automatic.
- This application is only use for a particular university at a time.

8.3 Future Extensions

- We can add feature like make a statistical report for faculties.
- We can add feature like taking attendance by Face Detection.

9. Bibliography

Website referenced

- <https://medium.com/>
- <https://stackoverflow.com/>
- <https://pub.dev/>