

# **EUROPEAN UNIVERSITY OF LEFKE**

## **FACULTY OF ENGINEERING**

### **Graduation Project I**

# **Employee attendance and manage control using QR Codes**

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Attendance taking is one of the main priorities of the companies, because it affects productivity of the company, productivity of employees. There are many different ways to track employee attendance such as manually entering employee hours into a spreadsheet, card swiping, fingerprint and retina scans, tracking employees through a GPS system, a traditional attendance register and QR code scan. Among them QR code attendance becoming very popular, because of its simplicity, low cost, accessibility and fast attendance time.

There are two types of QR code attendance systems:

- First one is giving every employee a card with individual QR codes on it. Employees show this card to special device every time when they are attending. But it has many drawbacks. Among colleagues and acquaintances, these cards can be exchanged or copied to log in with their details and then mark their attendance. It is also depends on electricity and Wi-Fi.
- Second one is using employee's smartphone for scanning one QR code that was provided on the screen, door or wall. Employees scan QR code in special app on their smartphones. There

is no need for special devices. It works even when there is no electricity or Wi-Fi. Employees can't cheat in it. It uses GPS, unique device id and user registration by the authority of the administrator to make it secure. Employees can see their attendance results at any time on their smartphones.

Employee attendance and manage control using QR Codes uses the second approach (type), because it is more efficient and effective method than the first one.

**Supervisor**

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# 1. Introduction

Smartphones play an important part in our daily lives in this technological age. Smartphones can now handle the majority of problems fast and easily. With many social apps, business apps, problem-solving apps, educational apps, and marketing apps, it has made everyone's life simpler and easier. QR code attendance system for employee app is one of them. It uses employee's smartphone for scanning QR code that was provided on the screen, door or wall. There is no need for special devices. It works even when there is no electricity or Wi-Fi. Employees can't cheat in it. It uses GPS, unique device id and user registration by the authority of the administrator to make it secure. Employees can see their attendance results at any time on this app.

## 1.1 Problem definition

There are many other employee attendance systems.

They have many drawbacks:

- Slow Attendance Taking
- More Paper Waste
- Special Equipment Required
- Depends on Electricity and Wi-Fi
- Assembling and Disassembling is hard
- Special Training for employees
- Not Secure

## 1.2 Goals

The purpose of the project is to make attendance system simple, low cost, accessible, fast and secure.

- **Faster Attendance Taking:** It takes only a few seconds per employee for checking in.
- **Least Paper Waste:** There is no need for papers, because the whole attendance data will be stored in the online cloud. This data can be accessed at any time.

- **No Special Equipment Required:** No need for special equipment. It only needs smartphone and generated QR code for attending.
- **No Electricity:** It works even when there is no electricity or Wi-Fi.
- **Easy Assembling and Disassembling:** There is no need to worry about arranging laptops, staff members and stationery. It is easy to use a smartphone as a QR code scanner via mobile apps.
- **Simple Pre-preparation:** There is no need for special training for the employees, because smartphone QR code scanners are simple and easy to use.
- **Secure:** It is very hard cheat or hack system. It uses GPS, unique device id and user registration by the authority of the administrator for that.

## 2. Literature Survey

Using punch cards, log books, fingerprint systems, barcodes and QR codes among the different types of attendance systems that have been created, nevertheless causes several issues, such as supplying inaccurate information to users. The goal of a smartphone-based QR code attendance system is to computerize the conventional method of recording attendance and give an easy and efficient approach to track attendance at institutions today. Smartphones are the most prevalent device used in marketing and business.

- **Compare1:** It does not provide individual QR codes to its users like many other QR code attendance systems, instead it uses one QR code for all users for attending.
- **Compare2:** It uses smartphone for scanning the QR code that was provided, unlike many other systems which use individual cards and special equipment for attending.

- **Compare3:** Employees can see their attendance results through application on their smartphones, unlike many other systems in which employees don't know anything about their attendance.
- **Compare4:** It works even when there is no electricity, unlike many other attendance systems which depend on electricity and Wi-Fi.
- **Compare5:** It is more secure than other QR code attendance systems. It uses GPS, unique device id and user registration by the authority of the administrator.

### 3. Background Information

#### 3.1 Required software

- **Flutter :**  
Flutter is the best in mobile application development.
- **Android Studio :**  
Android Studio is the best IDE for mobile application development.
- **Django or Firebase :**  
Django or Firebase for backend.

#### 3.2 Other software

- **Adobe Photoshop and Flaticon :**  
For design icons.
- **Git :**  
Used for repository.

## 4. Modules

There are two modules for employees and employers.

### 4.1 Employee module

This module used by employee. It has sign in and home pages.

#### 4.1.1 Sign in page

**<User type> drop down button:** Select “Employee” user type

**<ID> text field:** Enter employee id

**<Password> text field:** Enter employee password

**<Forgot Password> button:** Open forgot password page

**<Save> check button:** Save employee id and password

**<Sign In> button:** Sign in as an employee

#### 4.1.2 Home page

**<Mark Attendance> button:** Open mark attendance page

**<My Attendance Results> button:** Open my attendance results page

**<My Salary> button:** Open my salary page

##### 4.1.2.1 Mark Attendance page

This page opens QR code scanner.

If scanning is successful it shows “Successful” text with Tick icon,

Else it shows “Unsuccessful” text with corresponding problem.

##### 4.1.2.2 My Attendance Results page

**<Attendance Results> chart:** Shows chart of attendance results

**<Daily Attendance> list:** It will show scrollable list of daily attendance results. Below single element of the list:

**<Date> text field:** Show date of attendance

**<IN> text field:** Show employee arrival time

**<OUT> text field:** Show employee leaving time

#### **4.1.2.3 My Salary page**

This page shows salary and its corresponding calculations according to attendance results.

### **4.2 Employer module**

This module used by employer. It has sign in and home pages.

#### **4.2.1 Sign in page**

**<User type> drop down button:** Select “Employer” user type

**<ID> text field:** Enter employer id

**<Password> text field:** Enter employer password

**<Forgot Password> button:** Open forgot password page

**<Save> check button:** Save employer id and password

**<Sign In> button:** Sign in as an employer

#### **4.2.2 Home page**

**<Register Employee> button:** Open employee register page

**<Employees> button:** Open employees page

**<Manual Attendance> button:** Open manual attendance page

**<Attendance Report> button:** Open attendance report page

**<Salary> button:** Open salary page

##### **4.2.2.1 Register Employee page**

**<Employee ID> text field:** Enter employee id

**<Name> text field:** Enter employee name

**<Surname> text field:** Enter employee surname



**<Employee Branch> text field:** Enter employee branch

**<Phone number> text field:** Enter employee phone number

**<Email> text field:** Enter employee email

**<Address> text field:** Enter employee address

**<Device id/IMEI> text field:** Enter device id

...

#### 4.2.2.2 Employees page

**<Search Employee> text field:** Search employee

**<Employees> list of employee buttons :** Select, then check or update employee information on new page

#### 4.2.2.3 Manual Attendance page

**<Search Employee> text field:** Search employee

**<Employees> list of employee :** Select employee

**<IN> text field:** Enter arrival time

**<OUT> text field:** Enter leaving time

#### 4.2.2.4 Attendance Report page

**<Search Employee> text field:** Search employee

**<From> text field:** Search employee from

**<To> text field:** Search employee up to

**<Export to Excel> button:** Export selected table as an Excel file

**<Employees> Table:** Table of employee attendance results

#### 4.2.2.5 Salary page

<Search Employee> **text field:** Search employee

<From> **text field:** Search employee from

<To> **text field:** Search employee up to

<Export to Excel> **button:** Export selected list as an Excel file

<Employees> **Table:** List of employee and corresponding salary results

## 5. Risk Analysis

- **Poor Productivity:** I might not meet the deadline, because of poor productivity. I will start to work on the project after the final exams, so that I can finish it on time.
- **Firebase database:** I will use Firebase as a backend. If Firebase stops working or responding, my application stops as well. For preventing such problems from happening, I will learn Django and use it for the backend, if time allows.
- **Stakeholder Expectation:** A supervisor may expect something different that will change the whole project from the root. It will cause huge time delays and problems. I will explain the whole project in detail to the supervisor before starting working on it.
- **Stakeholder Suggestion:** A supervisor may suggest something new that requires huge changes in the code. It will cause time delays. For minimizing the effect of such risks, I will write code so that it can evolve easily without big changes.
- **Low Stakeholder Engagement:** A Supervisor may be passive or in other words responds slowly. It will cause time delays in developing and disagreements in deploying. For preventing such problems from happening, I will choose right supervisor.

## **6. Ethics**

- Employees must use smartphones which have Camera and GPS.
- Employees must bring their smartphones that were registered by the admin, to the work.
- Employees must use QR code attendance application for scanning QR codes that were provided by the employer.
- Employees must allow access to Camera and GPS for QR code attendance application on their smartphones.
- Employees must scan QR codes that were provided by the employer with their smartphones, while arriving and leaving.
- If there are problems with attending, employees must visit employer (admin) office for manual attendance.
- If employees change their phone to another one, they must inform about it to the employer (admin) for using QR code attendance application on their new phones.
- Attendance can be quantified and verified, and employers keep track of employee attendance and leave records. Based on that salaries can be calculated.

## **7. Conclusion**

The purpose of this project is to make attendance system simple, low cost, accessible, fast and secure.

## 7.1 Benefits

### a. Benefits to users:

1. **Faster Attendance Taking:** It takes only a few seconds per employee for checking in.
2. **Least Paper Waste:** There is no need for papers, because the whole attendance data will be stored in the online cloud. This data can be accessed at any time.
3. **No Special Equipment Required:** No need for special equipment. It only needs smartphone and generated QR code for attending.
4. **No Electricity:** It works even when there is no electricity or Wi-Fi.
5. **Easy Assembling and Disassembling:** There is no need to worry about arranging laptops, staff members and stationery. It is easy to use a smartphone as a QR code scanner via mobile apps.
6. **Simple Pre-preparation:** There is no need for special training for the employees, because smartphone QR code scanners are simple and easy to use.
7. **Secure:** It is very hard cheat or hack system. It uses GPS, unique device id and user registration by the authority of the administrator for that.

### b. Benefits to me:

1. Increase my knowledge in mobile and backend development
2. Increase my self-confidence as a Mobile developer
3. In-depth understanding of QR codes
4. Increase my project management and problem solving skills
5. Increase my creative and critical thinking skills

### **Why did I choose this project?**

I chose this project because I wanted to learn more about QR codes. I think nowadays every programmer should know about it. Recent years, I began to notice QR codes everywhere, from Wi-Fi passwords up to COVID-19 test results, so I started to interest in this topic. I searched some QR code projects from the internet and found that there are only a few projects about the QR code attendance system. These projects had some drawbacks, so I wanted to do a new better one. I think there are also many fields in which QR codes can be used, but I started it with QR code attendance system.

### **7.2 Future Works**

For now, I have no idea, but if there is something I can add or improve I will do it.

## **8. References**

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