



جامعة تبوك  
University of Tabuk

Faculty of Computers and Information Technology (FCIT)

Auto-attendance

Supervisor: Dr Mohammad Naif Al-Atawi

Submitted in partial fulfilment of the requirements for the Degree of Bachelor of Computer Science

Academic Year: 2022/23

### **Declaration of Originality**

This project is all my work and has not been copied in part or whole from any other source except where duly acknowledged. As such, all use of previously published work (from books, journals, magazines, the internet, etc.) has been recognized within the main report to an entry in the References list.

I agree that an electronic copy of this report may be stored and used for plagiarism prevention and detection.

I understand that cheating and plagiarism constitute a breach of University Regulations and will be dealt with accordingly.

Signed:

Date:



**Office Stamp**

### **Copyright**

The copyright of this project and report belongs to the University of Tabuk.

- **Abstract**

It is a mobile app for phones that facilitates many things that used to take much Time for the Student and the Lecturer, and its primary goal is to facilitate. Facilitate attendance and the absent and other items such as knowing the locations of the halls and teachers for each college and lecture to facilitate attendance in the fastest way to the hall or connected to the teachers' offices

every Student has the UniFinder app, and every hall has an Ibeacon that holds the lecture info and hall number lecturer that is added to his student schedule. The Ibeacon will sense the student who has the UniFinder app and match his University ID to the Student of this current lecture. If University ID matches the student of this current lecture, then his (present); if not, send a notification. This hall does not match your Course.

# Table of Contents

Abstract .....	3
Table of Contents .....	4
Additional Materials on the Accompanying CD .....	5
List of Table .....	6
List of Figures .....	7
List of Abbreviations.....	8
Acknowledgements.....	9
<b>1    Introduction.....</b>	<b>10</b>
1.1    Background to the Project .....	10
1.2    Project Objectives .....	10
1.3    Aims and Objectives .....	10
1.3.1 Advantage .....	10
1.3.2 Drawback.....	11
<b>2    Investigation .....</b>	<b>12</b>
2.1    Where's my Staff.....	12
2.2    TimeCamp .....	13
2.3    Bonsai.....	13
2.4    Odoo .....	14
2.5    Menaitech .....	14
<b>3    Methodology .....</b>	<b>16</b>
<b>4    Requirements .....</b>	<b>17</b>
4.1    Functional Requirements .....	17
4.2    Non-Functional Requirements.....	18
<b>5    Analysis .....</b>	<b>19</b>
5.1    Use Case Diagram .....	19
5.2    Sequence Diagram .....	20
5.3    Activity Diagram.....	21
<b>6    Design.....</b>	<b>22</b>
6.1    Entity Relationship Diagrams.....	22
6.2    Data Dictionary Design.....	23
<b>7    Bibliography and References .....</b>	<b>25</b>

## **Additional Materials on the Accompanying CD**

## List of Table

<b>TABLE</b>	<b>TITLE</b>	<b>PAGE</b>
Table 1.	Comparison with related systems	15
Table 2.	Admin	23
Table 3.	Staff info	23
Table 4.	Teacher	23
Table 5.	Student	23
Table 6.	Department	23
Table 7.	Hall Details	24
Table 8.	Hall	24
Table 9.	Schedule	24
Table 10.	Ibeacon	24

## List of Figures

<b>FIGURE</b>	<b>TITLE</b>	<b>PAGE</b>
Figure 1.	Where's my Staff website	12
Figure 2.	TimeCamp website	13
Figure 3.	Bonsai website	13
Figure 4.	Odoo website.	14
Figure 5.	Water Fall Stages	16
Figure 6.	Ibeacon operation	17
Figure 7.	use case Diagram	19
Figure 8.	Sequence Diagram	20
Figure 9.	Activity Diagram	21
Figure 10.	ER Diagrams	22

## List of Abbreviations

CS	Computer Science
----	------------------



## **Acknowledgements**

We want to thank everyone who contributed to the successful completion of this project. We thank our research supervisor, Dr Muhammad Nayef Al-Atwi, for his invaluable advice, guidance and enormous patience throughout the research development.

In addition, we would also like to express our gratitude to our loving parents and friends who helped and encouraged us.

# 1 Introduction

In the beginning, let us review the problems, how much the Lecturer loses time for attending, and sometimes he mistakes another Student, but our project idea can solve it. What about the Students They mistake things that the project can solve, such as what is the proper hall and is that my Course; if the project has rich for the highest compilation, we can use it for things other than the university, such as Cafés, restaurants and touristic places, this project can have many ideas involving (area information, and sending it for the user).

## 1.1 Background to the Project

Given the importance of time for the student and the teacher and to take the maximum educational attainment. Our project focuses on saving time and facilitating many steps.

## 1.2 Project Objectives

- Speed of attendance and absence
- Find out where the halls are
- Knowing where the teachers are

### Problem overview:

- The college needs a way to facilitate the status of attendance and absence.
- The students, the teachers, and visitors may have difficulty finding the halls.
- The teacher loses 5-10 min to take attendance.
- The teacher may conflict with Student's names.

## 1.3 Aims and Objectives

Therefore, we are working on an application for university students to facilitate the connection and save Time for students to find halls and teachers.

Auto-attendance and timer for the duration of the student's lecture attendance.

Our system will save the teacher and student time. Also, the conflict with Student's name will not be an issue.

### 1.3.1 Advantages

- 1- Attendance and absence for all students automatically.
- 2- Temporary for the duration of the student's lecture attendance.

- 3- Hall status, is there a lecture or not.
- 4- Fetching the information of the current hall, for example (the lecturer, the Lecturer start timer)
- 5- Hall dates and locations.
- 6- Print the student attendance record for only the lecturer.

### 1.3.2 Drawbacks

- The Cust of Ibeacon
- Does not specify the time if the Ibeacon didn't indicate the student.
- If the student has his phone turned off, then his absent.
- If the student has his phone turned off in the middle of class time, it will show less attendance time in state time.

## 1.3 Overview of This Report

In addition to the current chapter, the report consists of nine other chapters:

- Chapter 2 presents the investigation.
- Chapter 3 presents the methodology.
- Chapter 4 presents the requirements.
- Chapter 5 depicts the analyses of the system.
- Chapter 6 describes the design of the system.
- Chapter 7 presents the implementation.
- Chapter 8 presents the conclusions.

## 2 Investigation

We investigated many of the similar systems available on the web platform. We discovered several systems that offer a similar system approach through the web platform—analysed based on the observation.

### 2.1 Where's my Staff

Where's My Staff is a smartphone app developed by Trigg Company to help managers keep track of their employees during working hours. Office spaces and buildings  
Our application is distinguished by the presence and absence of features [1].

#### Features of Where's My Staff® app



##### History Accessibility

Our system allows managers check work attendance reports for each employee in addition to information about him and all reports history.



##### Power-Efficient

Our application is power-efficient. Since the position of an employee is sent seamlessly from his phone only on request (one or few times a day), Where's My Staff application will not drain the battery of the smartphone. Hence, it will not affect the normal behavior and usage of the phone.



##### Instantaneous and Differed Checking

**Figure 1.** Where's my Staff

## 2.2 TimeCamp

TimeCamp is a presence for employees and students but lacks many basic features, the most important of which are tracking, offices and places of presence [2].

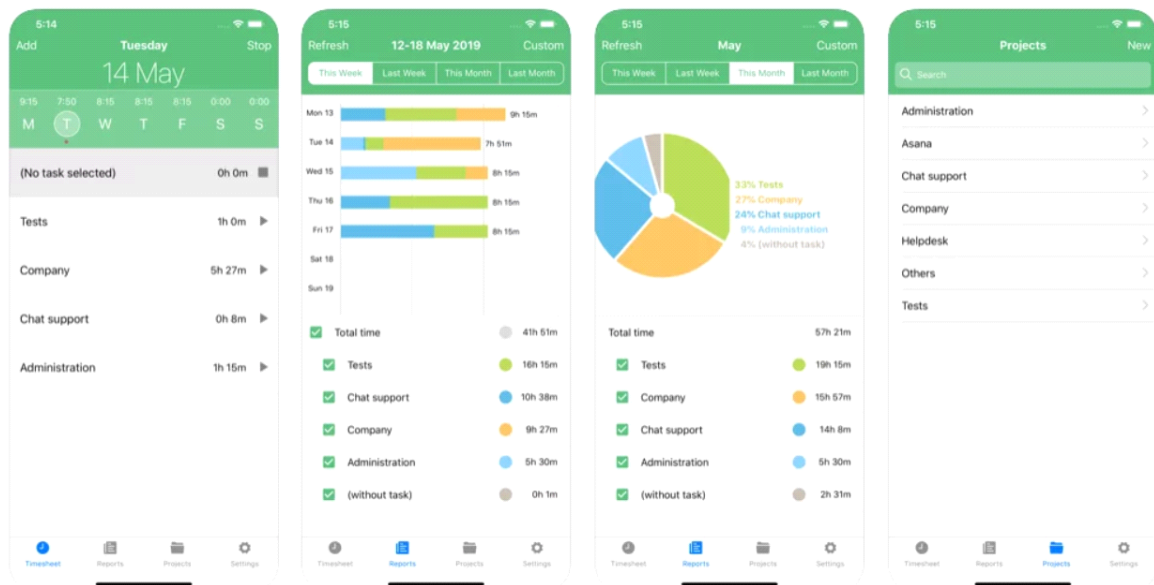


Figure 2. TimeCamp

## 2.3 Bonsai

Bonsai is a set of tools for employees to manage attendance, and we are distinguished from it by the hall locations and making it available for students, not just employees and teachers [3].

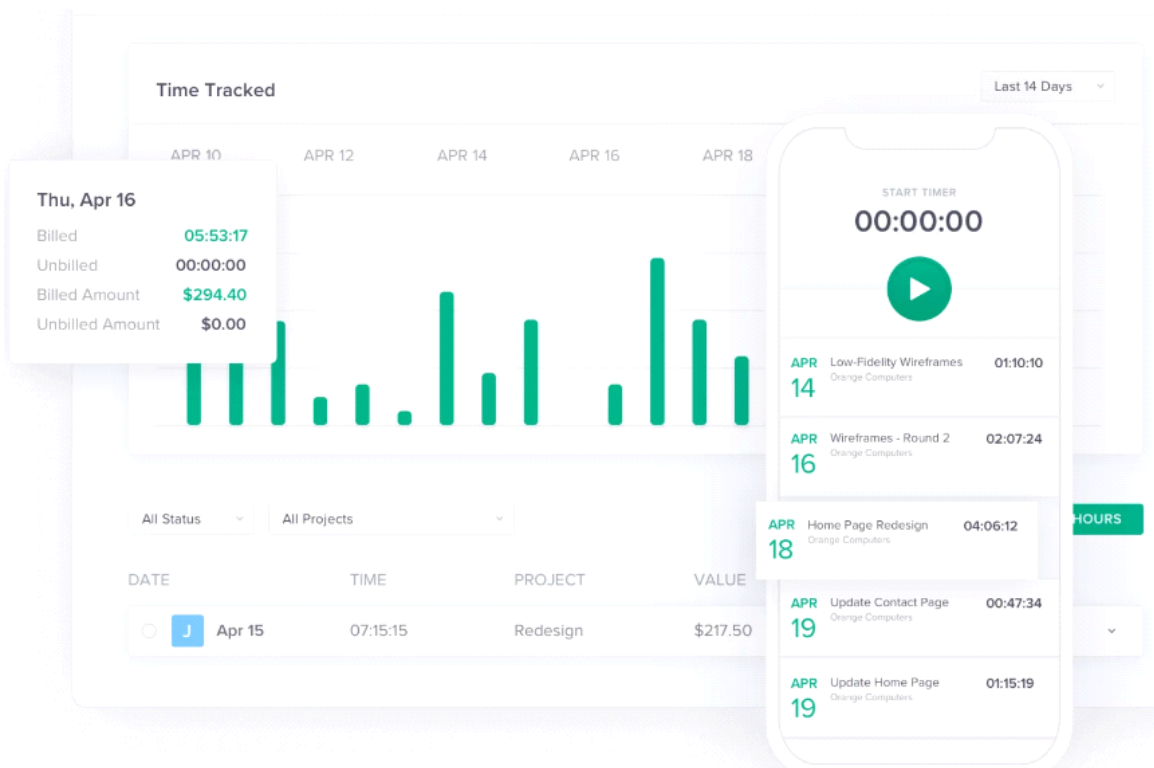


Figure 3. Bonsai

## 2.4 Odoo

This site has some points similar to our program, such as attendance management, but it lacks some features, such as where the employee is located [4].

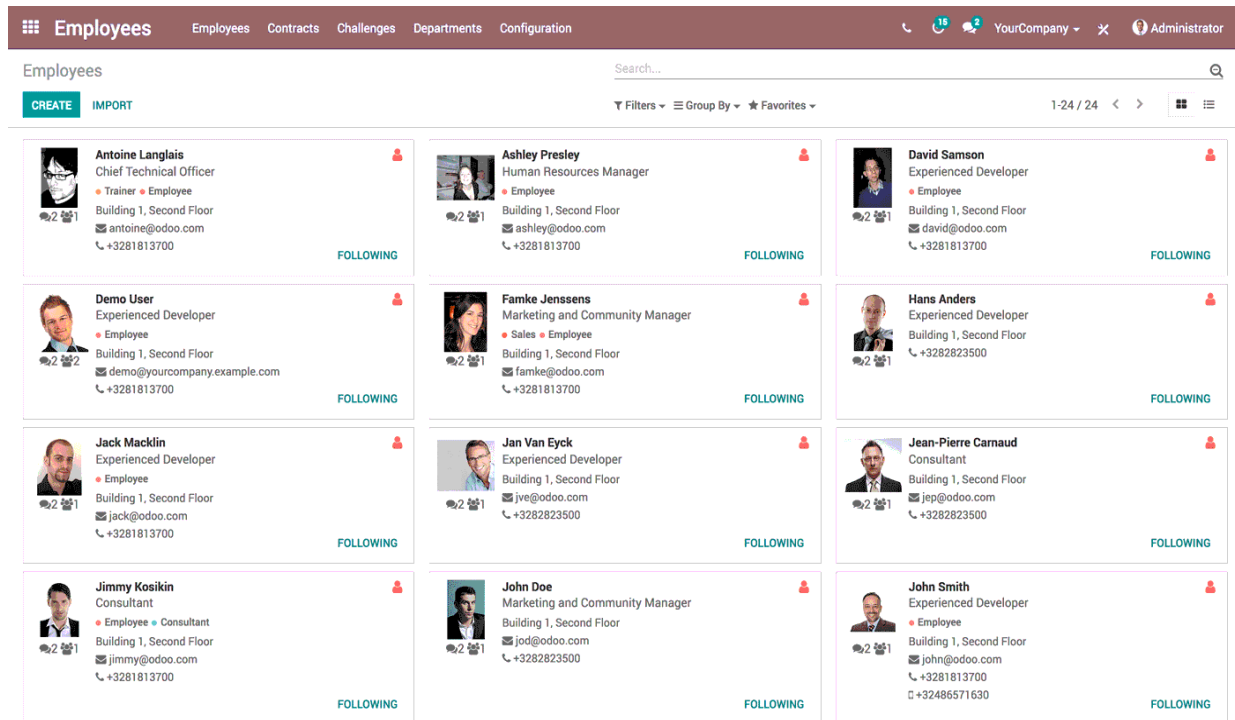


Figure 4. Odoo

## 2.5 Menaitech

In addition, there is no option to adjust delay times or select the hall's location, which is similar to our application.

Table 1. Comparison with related systems

Features	System				
	Where's my Staff	TimeCamp	Bonsai	Odoo	Menaitech
Web platform	✓	✓	✓	✓	✓
Free trial	✗	✗	✓	✓	✓
stability	✓	✓	✓	✓	✓
Arabic language	✓	✗	✗	✓	✓

### 3 Methodology

This project will use the waterfall methodology. The waterfall method is a project management approach that emphasises a linear progression from the beginning to the end of a project. Engineers often use this methodology and are front-loaded to rely on careful planning, detailed documentation, and consecutive execution.

The Waterfall process usually includes stages:

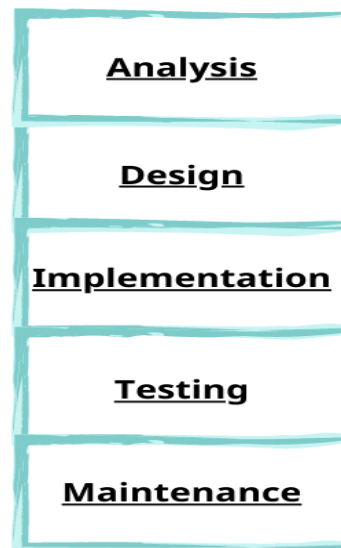


Figure 5. Water Fall Stages

#### **Analysis:**

The Waterfall methodology depends on the belief that all project requirements can be gathered and understood upfront. The project manager does their best to get a detailed understanding of the project sponsor's requirements. Written requirements, usually contained in a single document, describe each stage of the project, including the costs, assumptions, risks, dependencies, success metrics, and timelines for completion.

#### **Design:**

Software developers design a technical solution to the problems set out by the product requirements, including scenarios, layouts, and data models. First, a higher-level or logical design is created that describes the purpose and scope of the project, the general traffic flow of each component, and the integration points. Once complete, it is transformed into a physical design using specific hardware and software technologies.

#### **Implementation:**

Once the design is complete, technical implementation starts. In this phase, programmers code



applications based on project requirements and specifications, with some testing and implementation also taking place.

### Testing:

Testing must ensure the product has no errors, and all requirements have been completed, providing a good user experience with the software. The testing team will turn to the design documents, personas, and user case scenarios supplied by the product manager to create their test cases.

### Maintenance:

Once the software has been deployed in the market or released to customers, the maintenance phase begins. As defects are found, and change requests come in from users, a team will be assigned to take care of updates and release new software versions [5].

## 4 Requirements

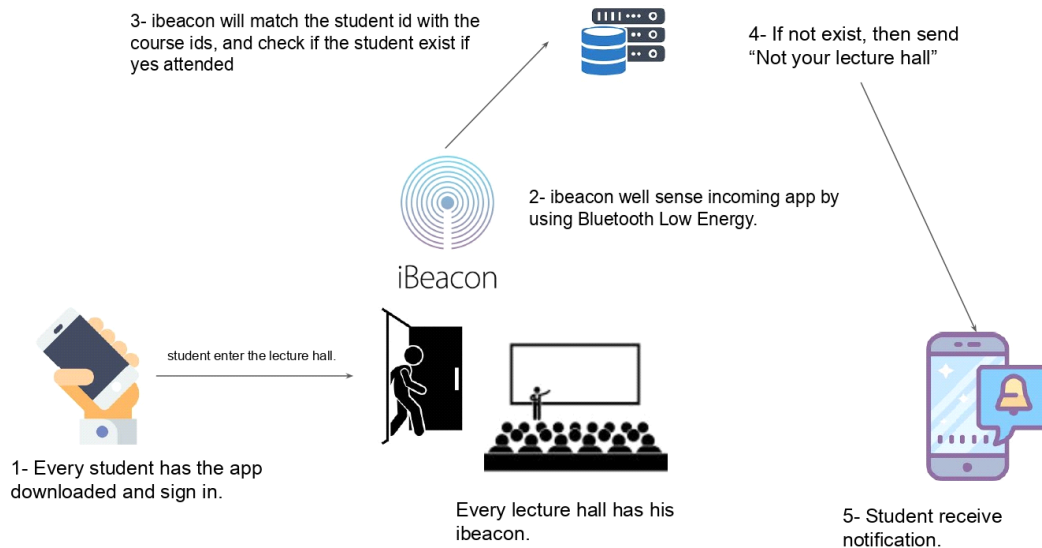


Figure 6. Ibeacon operation

### 4.1 Functional Requirements

Functional requirements are product features or functions that developers must implement to enable users to accomplish their tasks. This system has many functions lecturers that assist clinics with their processes and management.

For the software:

- Administrator controls the accounts of the Lecturer and the Student (Create, Modify,

Delete).

- Administrator controls the Lecturer and (Creates, Modify, and Delete).
- Administrator controls the student accounts (Create, Modify, Delete).
- Lecturer requests the auto-attendants.
- Lecturer requests to print the state of class (student's attendance time, attendance and absence).
- Students request the hall name.
- Students request the current hall state, which is (the subject of the class, Time of the class).

For the handwear:

- We will use it in our system Ibeacon device.

## **4.2 Non-Functional Requirements**

A non-functional requirement is a constraint or a requirement that the system is obligated to meet. Software quality attributes are specified in these documents. Scalability, maintainability, performance, portability, security, reliability, and many other non-functional requirements fall under these categories [10].

For the software:

We need to ask the company for permeation to find an Ibeacon device that allows us to program.

Connecting the Ibeacon to the system coding.

Connecting the Ibeacon to the database.

Building a server that holds all the students and lecturers.

For the hardware:

The cost of the Ibeacon that we need every hall to have.

Ibeacon sensor range.

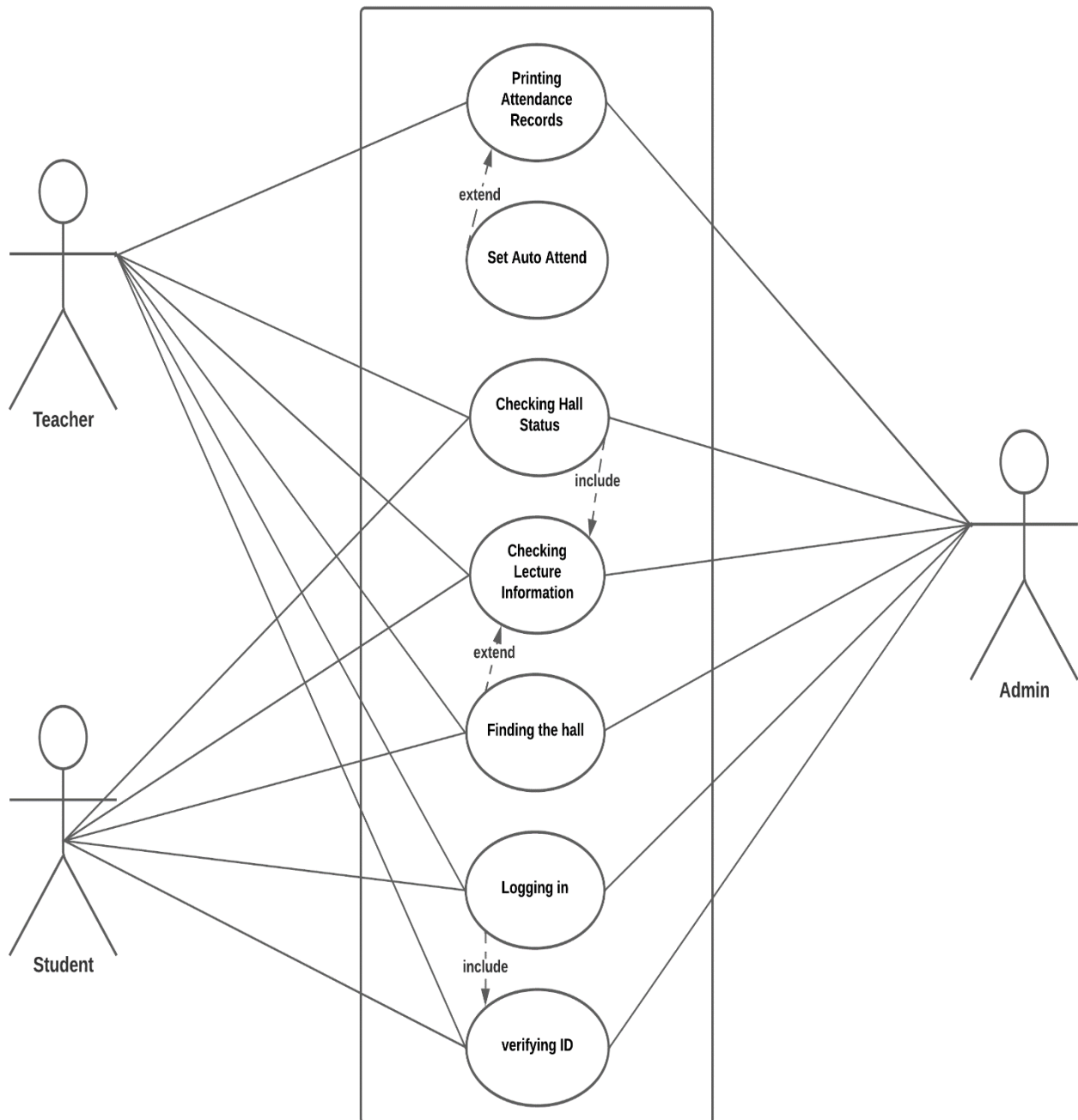
In case of hardware errors, we need to buy a new Ibeacon.

Does the Ibeacon stay on for timing the student attended?

## 5 Analysis

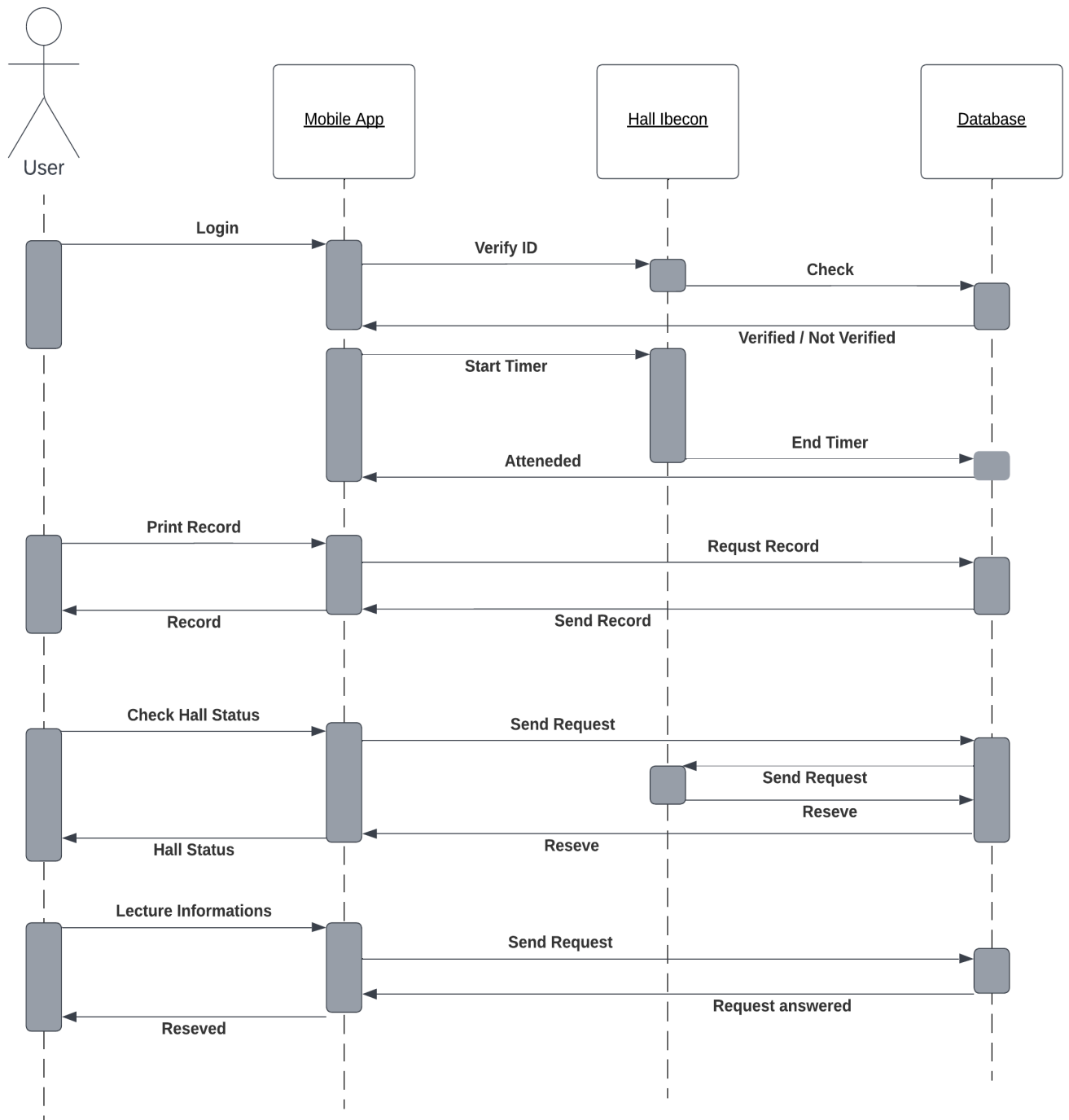
At this phase, we will use some of the Unified Modeling Languages (UML) in this project because of its great help in the analysis and documentation process. Using the schemes Case Diagram, Sequence Diagram, Activity Diagram and Class Diagram.

### 5.1 Use Case Diagram



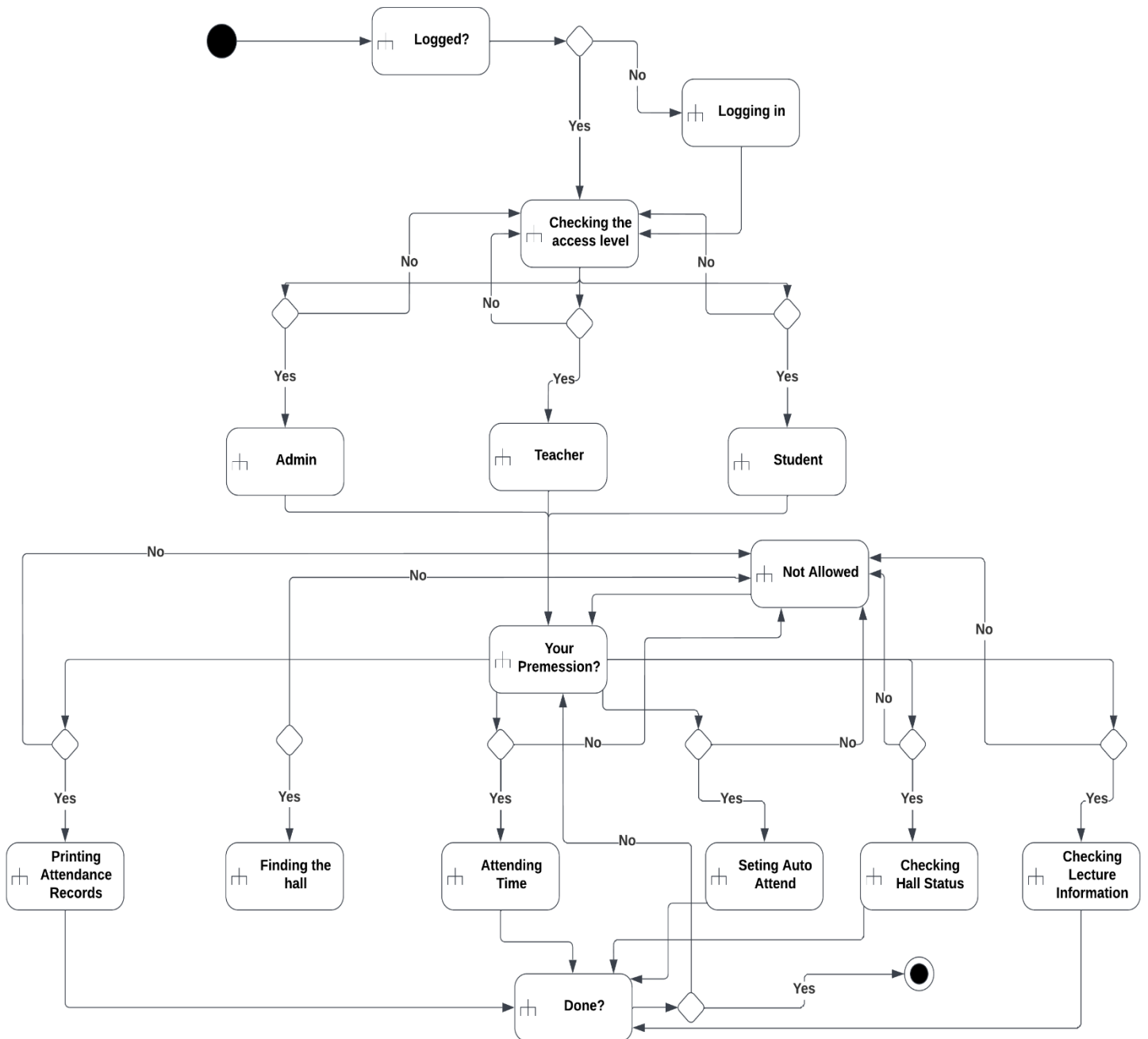
**Figure 7.** use case Diagram

## 5.2 Sequence Diagram



**Figure 8.** Sequence Diagram

### 5.3 Activity Diagram



**Figure 9.** Activity Diagram

## 6 Design

At this stage, we will present the entire system's design through a diagram shown in the figure conceptual databases and relationships between objects in the system through the Entity Relationship Diagram (ERD).

### 6.1 Entity Relationship Diagrams

An entity relationship diagram (ERD) shows the relationships of entity sets stored in a database [10].

#### Auto Attendance ERD

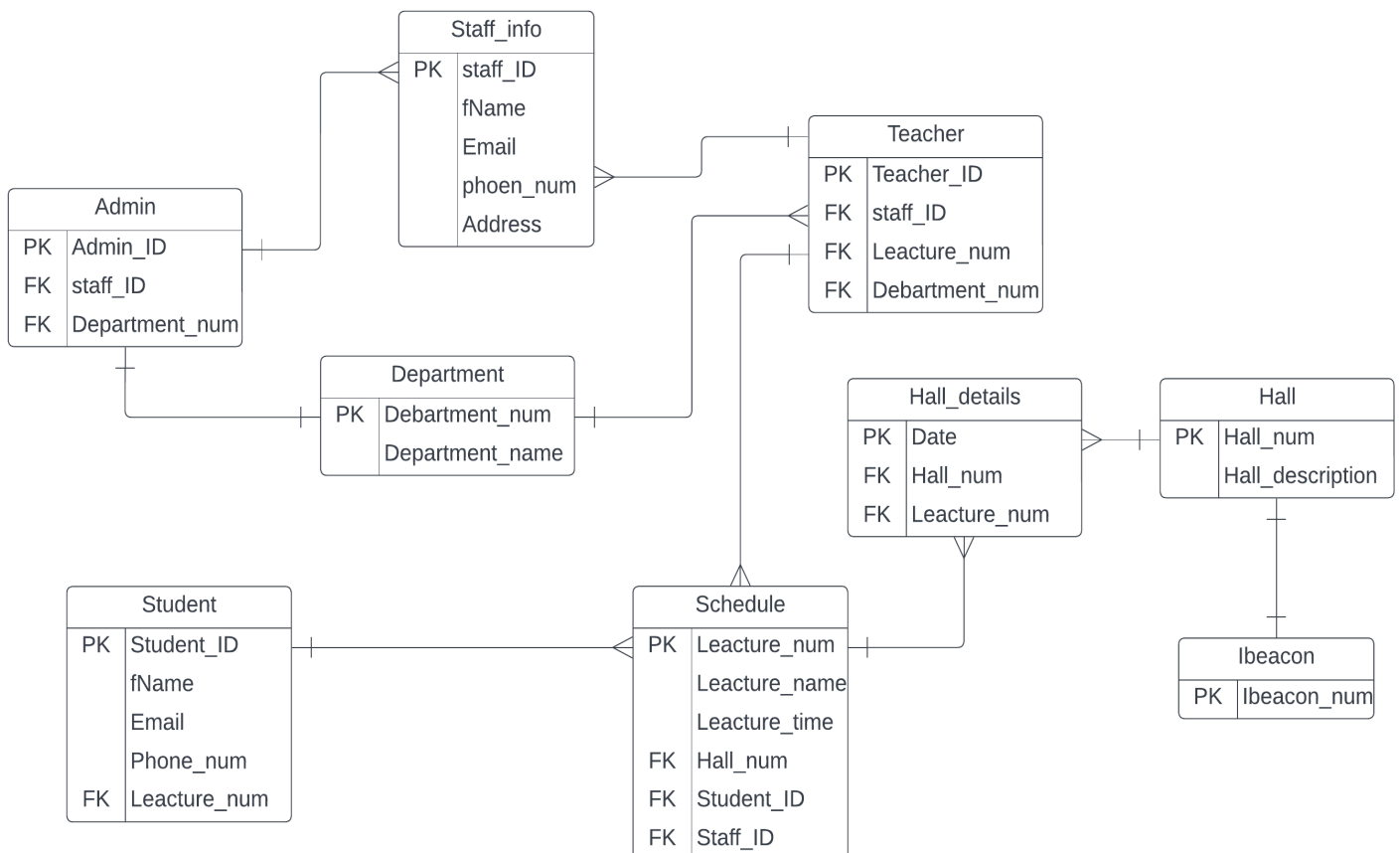


Figure 10. ER Diagrams

## 6.2 Data Dictionary Design

The data dictionary is an inventory of data elements in a database or data model with a detailed description of its format, relationships, meaning, source and usage [7]. The data dictionary for the project is shown in the tables below.

Table 2. Admin

Attribute	Type	Key
Admin_ID	Int(7)	PK
Staff_ID	Int(10)	FK
Department_num	varchar(5)	FK

Table 11. Staff info

Attribute	Type	Key
Staff_ID	Int(10)	PK
fName	varchar(50)	
Email	varchar(25)	
Phone_num	Int(10)	
Address	Varchar(50)	

Table 12. Teacher

Attribute	Type	Key
Teacher_ID	Int(7)	PK
Staff_ID	Int(10)	FK
Leacture_num	varchar(7)	FK
Department_num	Int(5)	FK

Table 3. Student

Attribute	Type	Key
Student_ID	Int(10)	PK
fName	varchar(50)	
Email	varchar(25)	
Phone_num	Varchar(10)	
Lecture_num	Varcahr(7)	FK

Table 3. Department

Attribute	Type	Key
Department_num	int(5)	PK
Department_name	varchar(25)	

Table 15. Hall details

Attribute	Type	Key
Date	Varchar(20)	PK
Hall_num	Int(5)	FK
Leacture_num	varchar(7)	FK

Table 15. Hall

Attribute	Type	Key
Hall_num	Int(5)	PK
Hall_description	varchar(50)	

Table 15. Schedule

Attribute	Type	Key
Leacture_num	Varchar(7)	PK
Leacture_name	Varchar(20)	
Leacture_time	varchar(15)	
Hall_num	Int(5)	FK
Student_ID	Int(10)	FK
Staff_ID	Int(10)	FK

Table 15. Ibeacon

Attribute	Type	Key
Ibeacon_num	Int(10)	PK



## 7 Bibliography and References

- 1- Where's my staff website → <https://www.whereismystaff.com/>
- 2- TimeCamp website → <https://www.timecamp.com/homepage>
- 3- Bonsai website → <https://www.hellobonsai.com>
- 4- Odoo website → <https://www.odoo.com/>
- 5- Adobe Experience Cloud, stages in a Waterfall process.
- 6- Geekforgeeks website → <https://www.geeksforgeeks.org/non-functional-requirements-in-software-engineering/>