Kingdom of Saudi Arabia
Ministry of Higher Education
Majmaah University
College of Science in Al-Zulfi
Department of Computer Science and Information

المملكة العربية السعودية
وزارة التعليم العالى
جامعة المجمعة
كلية العلوم بالزلفى
قسم علوم الحاسب والمعلومات

Department of Computer Science and Information

Project Report for the 1st Semester of year 1439-1440

Project Title:

MU-Zulfi Campus Query

Submitted by:

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Abstract

Today, mobile applications are being used for different new fields. In this project, a mobile application is produced to help visitors and students to reach any places in the campus college of Science, at Al-Zulfi, in Majmaah university by providing them with either text instructions or path map with low time and effort.

In this project there are two choices for users to reach their target. Place The first choice is to display text instructions which describe the path that users can track. The second choice is to display a virtual map that will describe the path to destination with graph including directed lines from source place to target place they want to visit.

Acknowledgement

I want to thank the supervisor of my project, Dr. Wael Khder, for his encouragement in order to complete this project and helping me in extracting the important things to achieve them in this work.

Also, I give my deep thanks to my college friends for their support and advices during working in this project.

Finally, I also thank my family for their continuous encouragement which increases my self-confidence to complete the project.

Thanks,

Hamad Ali

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Chapter 1

Introduction

1.1 Majmaah University

The establishment of Majmaah University came as a result of the decree of the Custodian of the Two Holy Mosques King Abdullah Bin Abdul Aziz Al-Saud and the Prime Minister and Chairman of Higher Education on Ramadan 3rd, 1430 - 24th of August 2009 to establish Majmaah University along with three other universities in Dammam city, Kharj province and Shaqr'a province.

Figure 1. 1 Majmaah University

Majmaah University aimed to serve a wide area including Majmaah, Zulfi, Remah, Ghat and Hawtat Sudair. It also helps in achieving the Ministry of Higher Education's objective in expanding the university education across the country. Therefore, Majmaah University will meet the growing number of high school graduates in the region which will reduce the pressure on universities in big cities.

Another significant reason for the establishment of Majmaah University is the value it adds to the people of the region in various aspects including social, cultural and awareness service. Inevitably, this shall help in upgrading the level of performance appraisal of government sectors via providing advanced courses and consultations. With regard to scientific research, the University will provide programs of high quality that will be in compatible with the University strategic objectives.

The royal decree no: 194/A on Zul-Hejjah 30th, 1430 – 17th of October 2009 to appoint Dr. Khalid Sa'ad Al-Mugren as the Rector of Majmaah University with higher rank accelerated the development process at the University. Dr. Al-Mugren focused on developing the existence colleges as well as building new ones in order to increase the number of majors that will meet the market demands. The concern of Dr.khaled Al-Mugren is to make Majmaah University a beacon of knowledge and enlightenment that is capable of offering education of high quality.

1.2 College of Science at Al-Zulfi

The Department seeks to qualify the students as specialists in the field of computer science in terms of study and analysis of the computer system and methods of its construction. Students are equipped with experience in using software tools such as operating systems, various programming languages and computer networks. A comprehensive curriculum has been designed to provide necessary skills to the students for their proficiency in this field. The department staff is continuously working for updating the B.Sc. program and revising its curriculum in accordance with the latest technologies in computer science and the fast-changing needs of the society.

1.3 Problem Definition

For anyone who reaches any place for the first time, he will spend a lot of time for exploring this place. Universities are considered from the most important places where any visitor can reach to study. Incoming students need to explore his/her University to reach any destination place.

For example, if any visitor /student/ wants to go to the library of the college, he/she has some choices, maybe ask someone to reach this place, or he/she can look at the manual maps at each floor in the building. Also he/she can look at all panels outside all rooms in all floors inside any building in the college.

Of course, any visitor consumes much effort and time reaching these places. Therefore, students will spend much time to reach location of their lecture halls or laboratories.

Figure 1. 2 College of Science Al-Zulfi

1.3.1 Project Goals

This project aims to provides a system which will save time and effort for anyone especially students entering the university for the first time to reach any destination.

1.3.2 Project Objectives

In this project, an android mobile application is produced to help visitors and students to reach important places in the campus of college Science, Al-Zulfi, in Majmaah university. This application prevent time and effort consuming.

Figure 1. 3 Android Mobile App

This mobile application will provide a lot of facilities like:

(1) Display a list for all important places at each layer in the college building.

(2) When the visitor chooses any destination to reach, the application will display a window including the instruction he will follow to reach it.

(3) Also, it has another option (map) to display a path on visual map that he will follow to reach to his destination easily.

1.3.3 Critical Success Factors (CSF)

Here, we will discuss the critical factors or activities required for ensuring the success of the project. The main of CSF is to determine what is central to the future of the project and achievement of that future; if the objectives associated with these factors are not achieved, the organization will fail. The critical success factors for this project are:

- Background and awareness of users of the application.
- Effective advertising and management of the project.
- Avoiding wrong handling of the system.
- Providing the application with continuous support and maintenance.
- Taking periodic users' feedback to know their problems and suggestions.
- providing security factors to make this application not stoppable.

1.3.4 General Rules (Assumptions)

A successful project manager always keeps an eye on his project's assumptions and constraints and understands them thoroughly as the risk management depends on these assumptions. If they are failed to be properly analyzed, it may affect the project's outcome.

- Concerning this project, we assumed that:
  - This project will serve to all visitors or new students to reach any destinations place in the college campus.
  - The feedback of all users using it will be positive.
  - It will save much time and effort than before.
  - All resources required for the project will be available.

Chapter 2

System Analysis and Specification

2.1. Introduction

The concept of the project is to easy navigate college campus to find any place easily without need for help. The users of the project maybe student of the college or visitor.

Visitors/ students:

- Visitors can choose inquired source and destination place they want e.g. labs, rooms, offices, administration.
- Browse graphical map with a path to destination place.
- Follow the instruction to destination place.
- Browse the whole map of each floor.

2.2. Description of Data Flow Diagram (DFD)

Data flow diagram (DFD) is a picture of the movement of data between external entities and the processes and data stores within a system.

2.2.1. Context Diagram

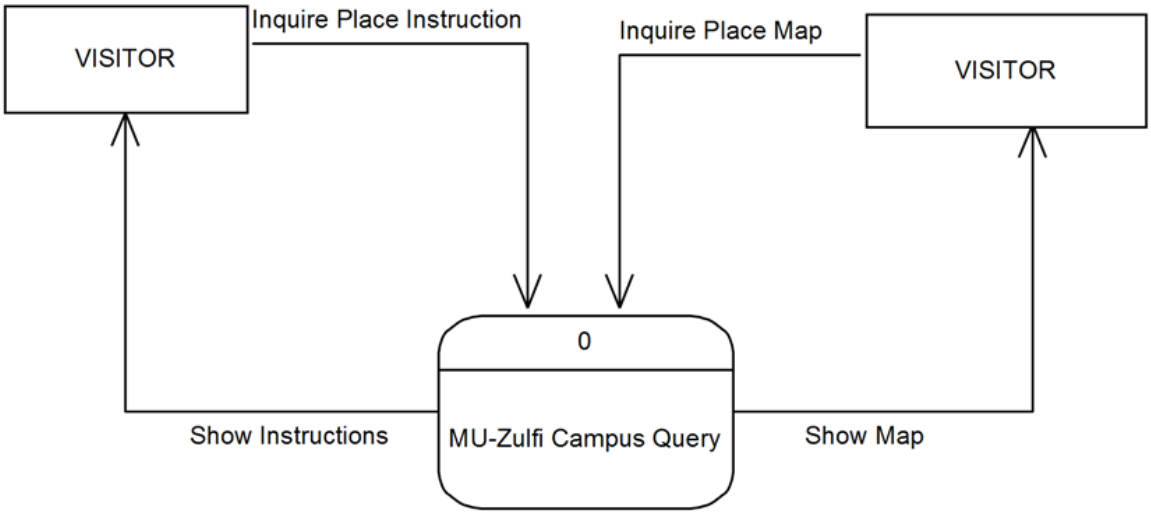


Figure 2. 1 Context Diagram for the system

2.2.2. Data Flow Diagram

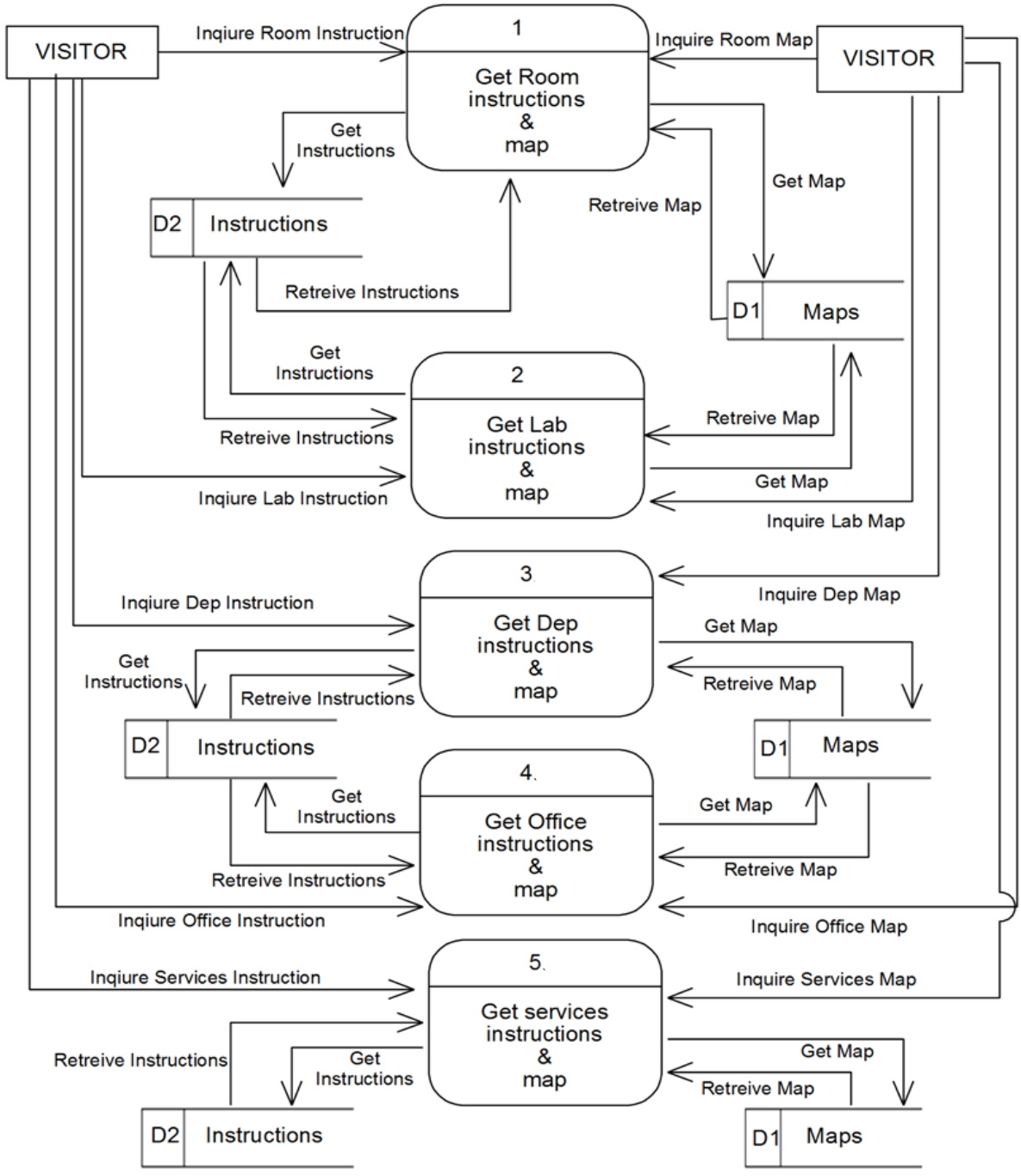


Figure 2. 2 Data Flow Diagram for the system

2.3. Data Modeling using (Entity Relationship Diagram (ERD), Class Diagram , Use Case Diagram, Activity Diagram)

In the above class diagram it's a disgram that illustrate the classes of the project and the functions and attributes that the the very class contain. As well as it's illustrate the relation between classes of the whole project for example in the office class the attributes of this class are

- **Id** : it's identifier that count the nuber of office that is required like office id 1,2,3 and so
- **Name** : it's contain the office name that belongs to specified doctor for example.
- **Description**: contains the path that can be viewed to the visitor to illustrate the path to him.
- **Map**: it's containd the map the illustrate the rout to the specified office .

The only function in this class is the **View()** method that is used for viewing the instructions and map of the desired office from the visitor.

Classes of Labs, Rooms, Departments, Services and adminstrations are contain the same attriutes and finction of the office class.

Map class contains the map id for specified room description for every map and the name of map that belong to a specified place.

Campus_query class is the class that containf object form every class in the project so it's contain the whole attributes and function of the all classes.

Class Diagram:

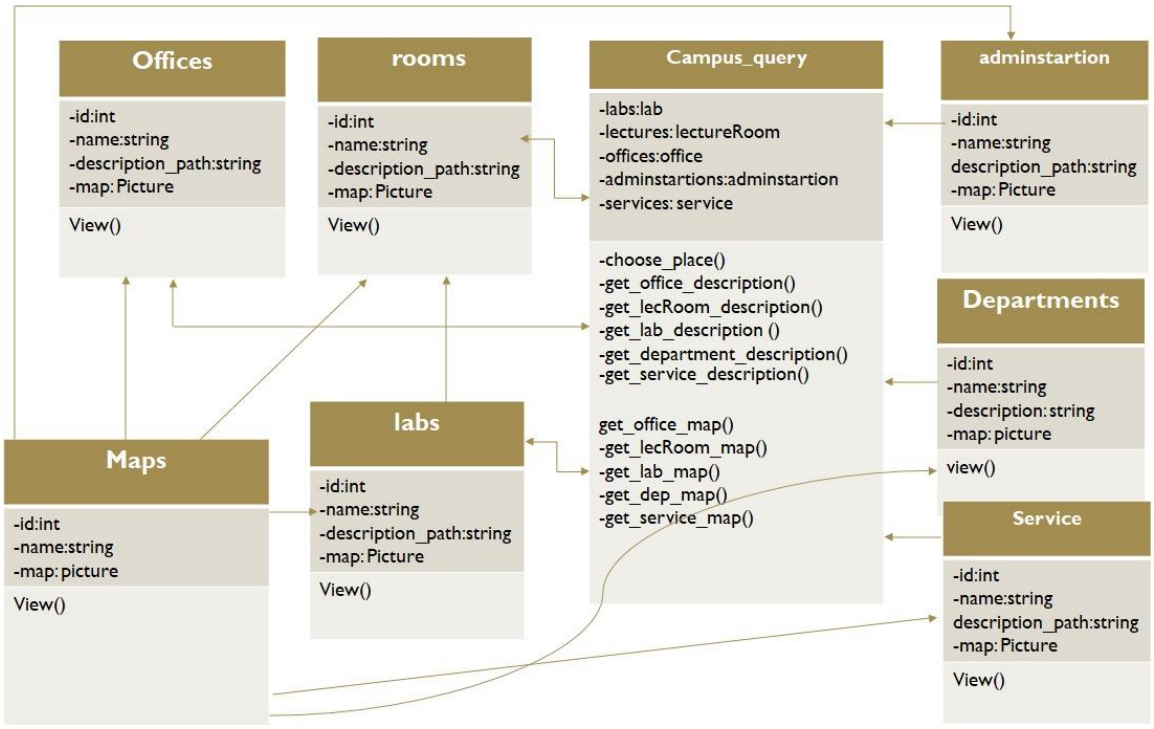


Figure 2. 3 Class Diagram for the system

Use Case Diagram:

- Use case that shows how the visitor acts to the application.

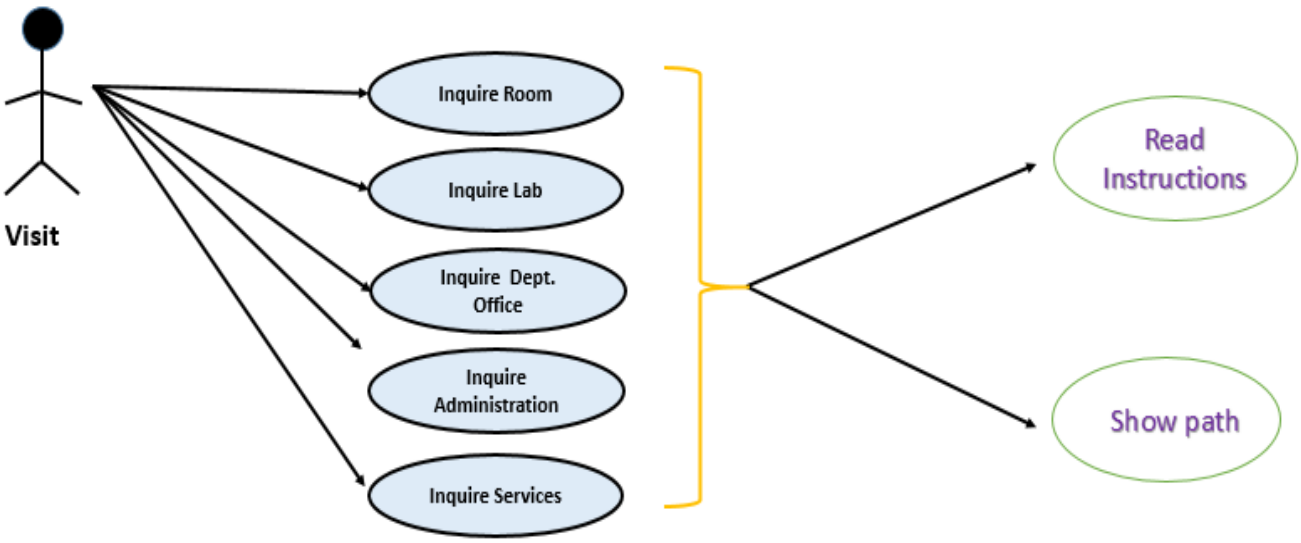


Figure 2. 4 Use Case diagram for the visitors

Sequence Diagram:

- Sequnce diagram of the Visitor in the system and how he interacts with the system via select source, select destination, find path, view instructions and view graphic map.

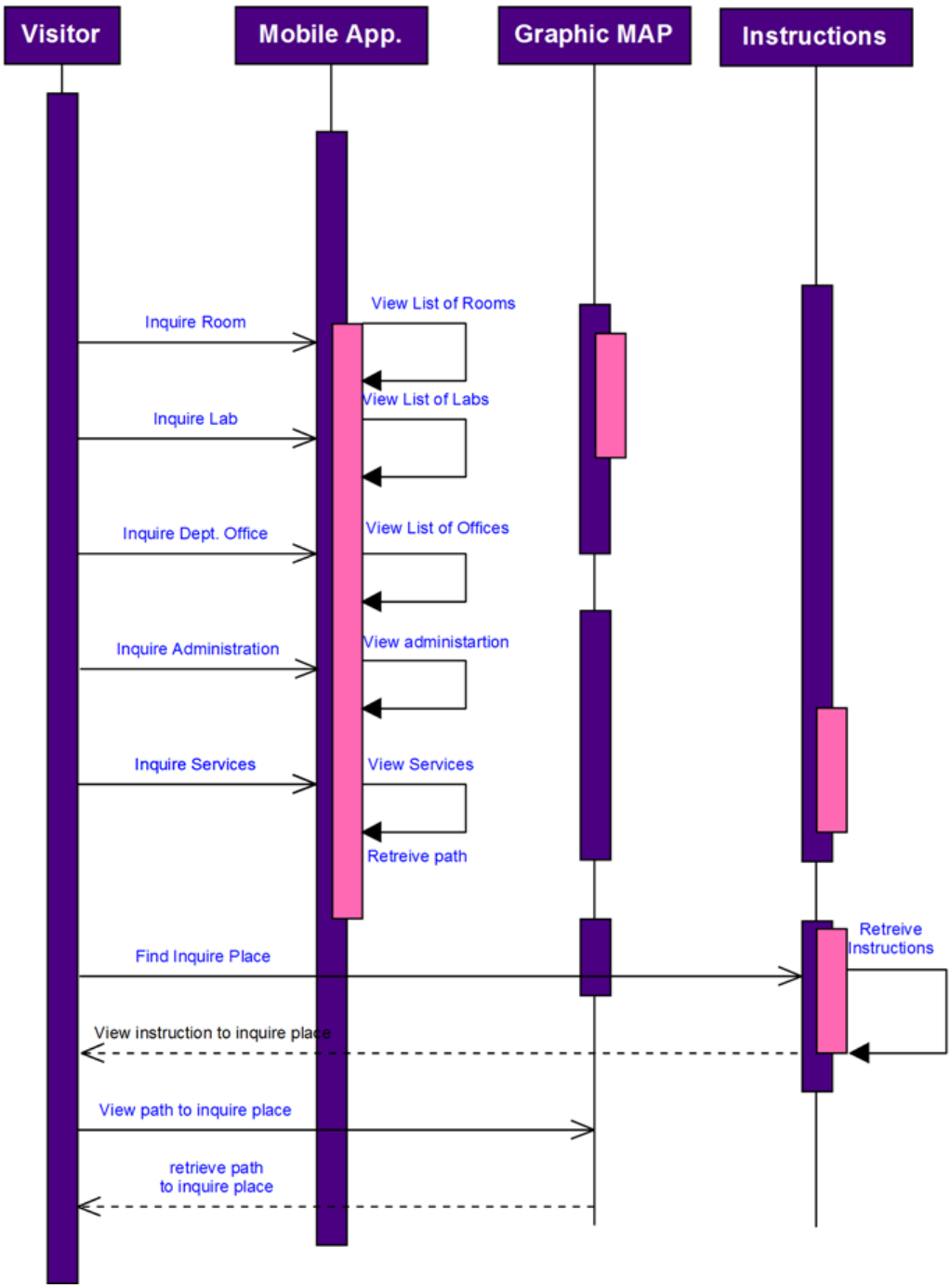


Figure 2. 5 Sequence diagram of User

Activity Diagram

The basic purposes of activity diagrams. It captures the dynamic behavior of the system. Other diagrams are used to show the message flow from one object to another, but activity diagram is used to show message flow from one activity to another.

Activity is an operation of the system. Activity diagrams are not only used for visualizing dynamic nature of a system, but they are also used to construct the executable system by using forward and reverse engineering techniques. The only missing thing in activity diagram is the message part.

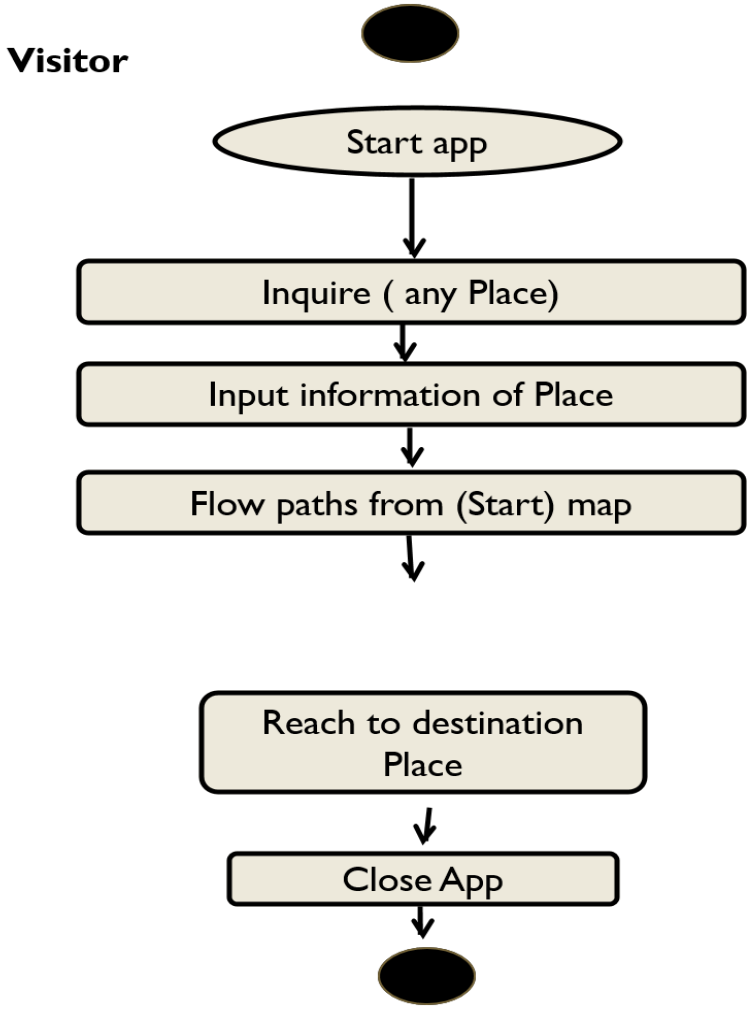


Figure 2. 6 Activity diagram

State Diagram

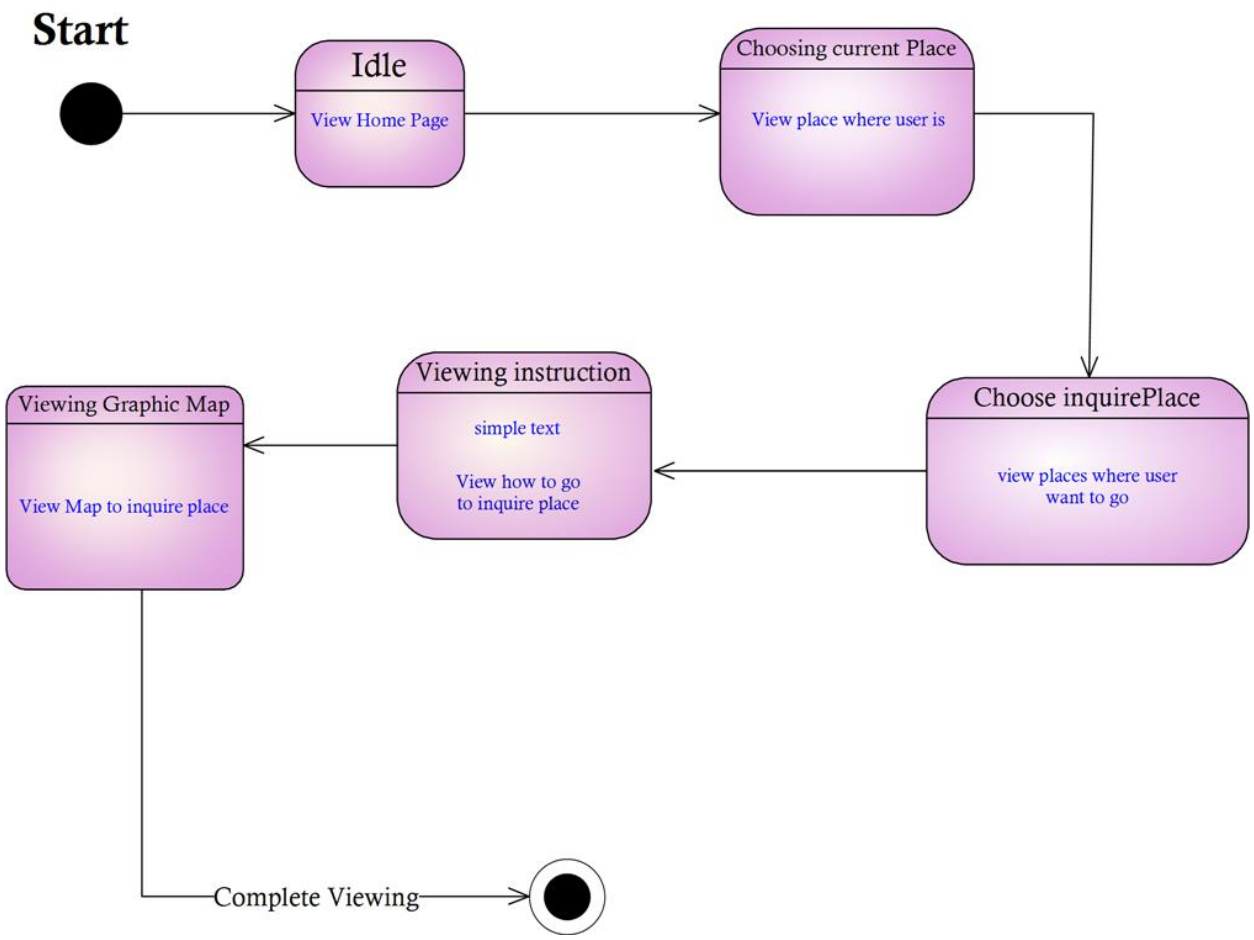


Figure 2. 7 State diagram

Entity Relationship Diagram (ERD)

An entity-relationship model (ERM) is an abstract and conceptual representation of data. Entity-relationship modeling is a database modeling method, used to produce a type of conceptual schema or semantic data model of a system, often a relational database, and its requirements in a top-down fashion. Diagrams created by this process are called entity-relationship diagrams, ER diagrams, or ERDs.

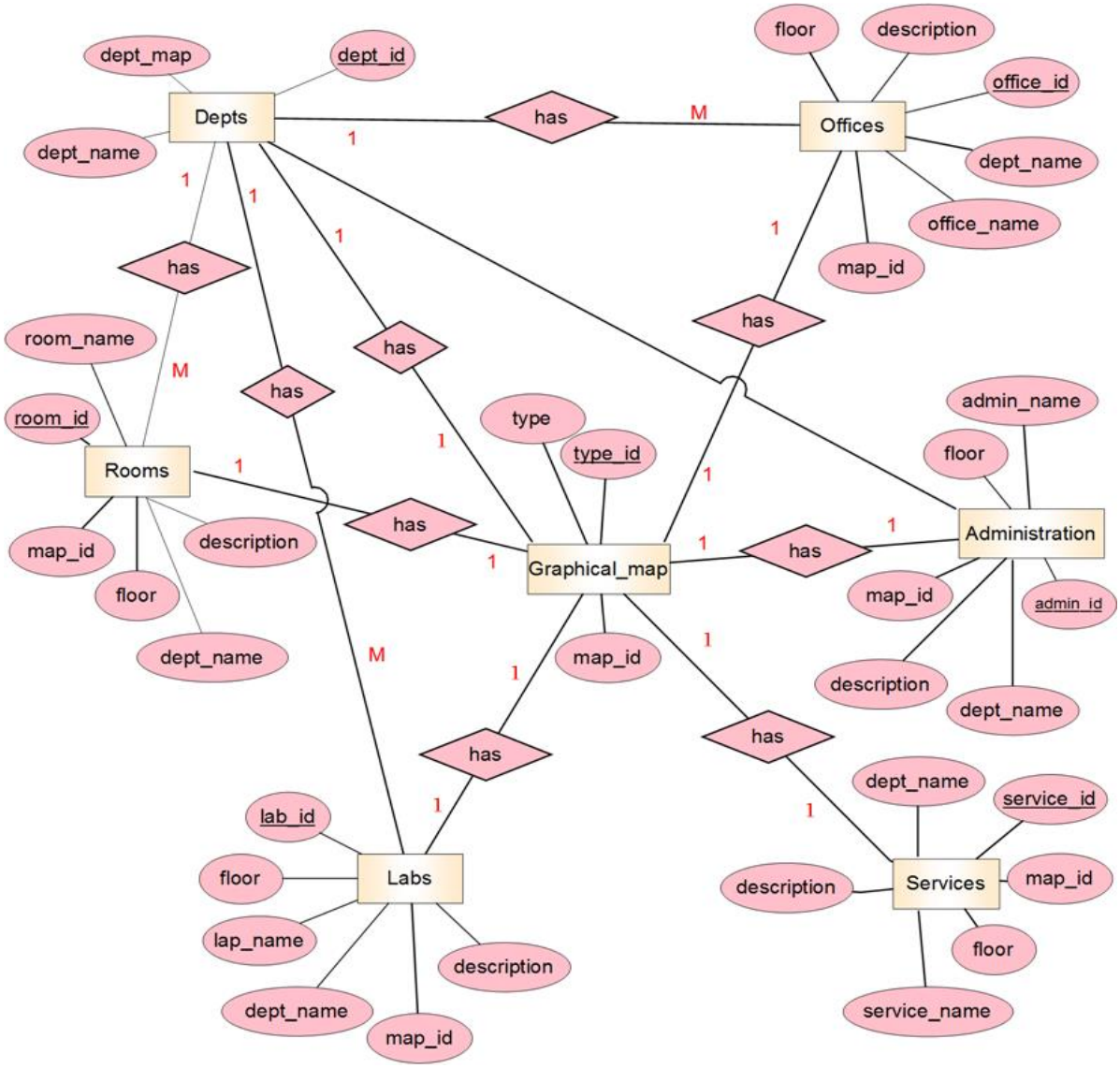


Figure 2. 8 Entity Relationship Diagram

Mapping Diagram

Mapping is the process of converting the entity relationship diagram (ERD) to database tables which we use it to create the database in any framework such as MY SQL workbench,. In this diagram, we join between tables by foreign key.

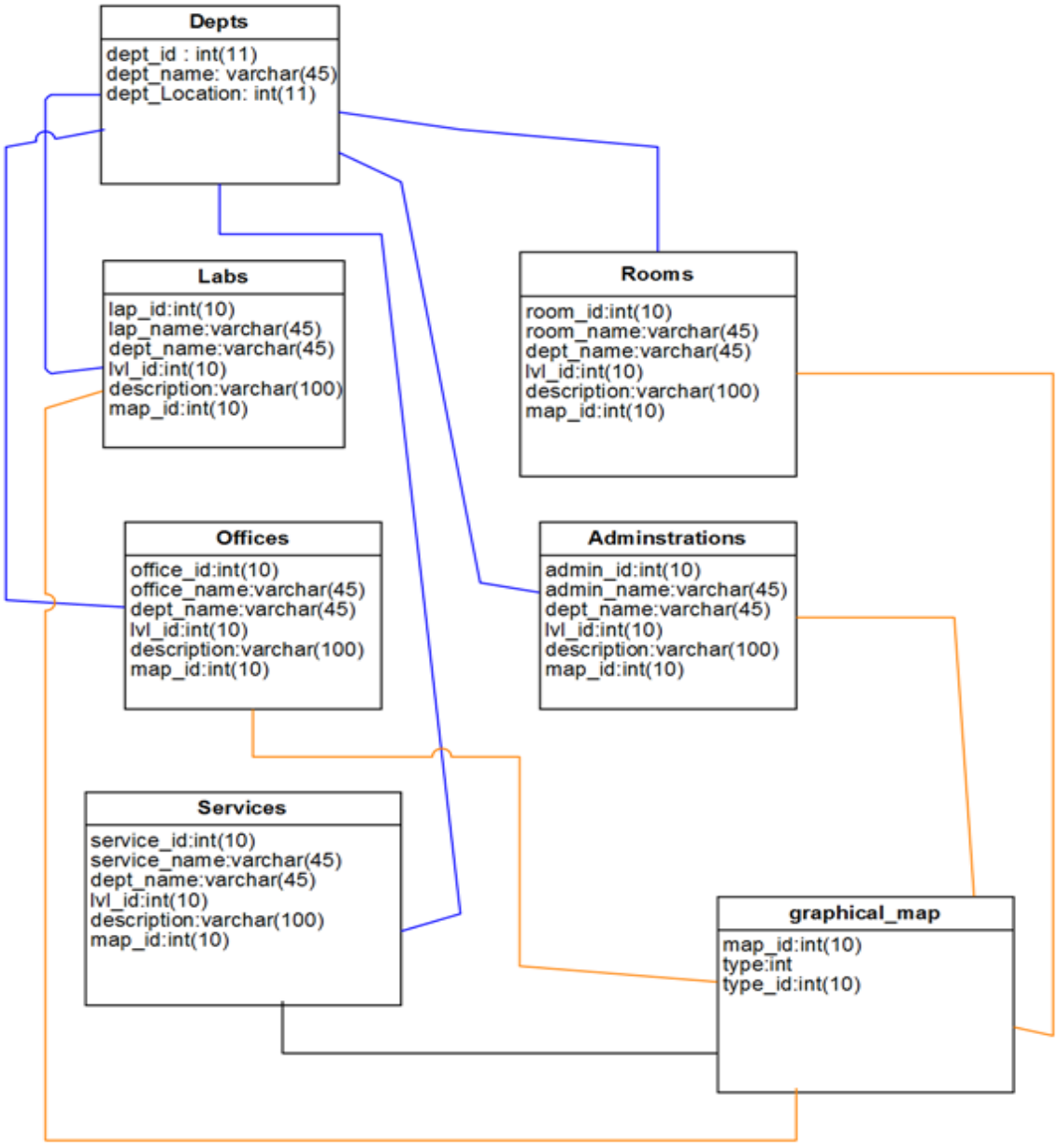
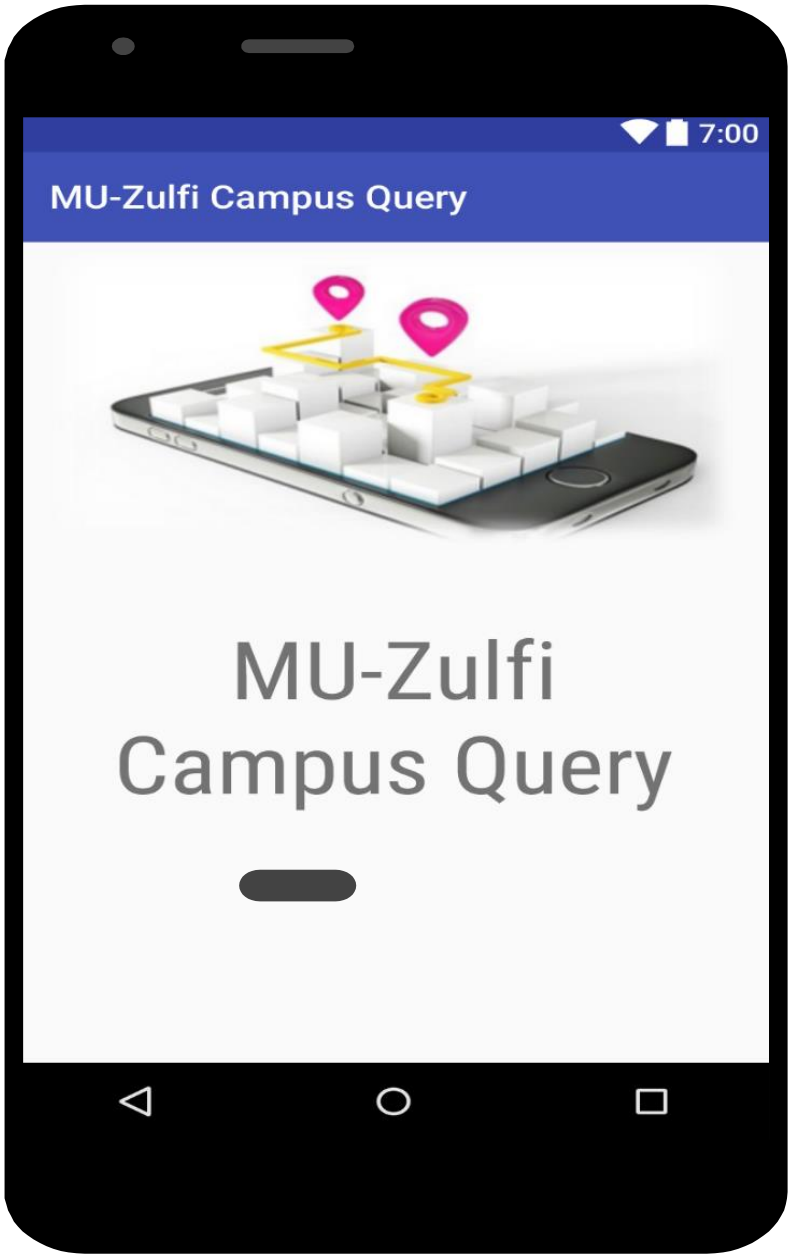


Figure 2. 9 Entity Relationship Diagram

Project interfaces



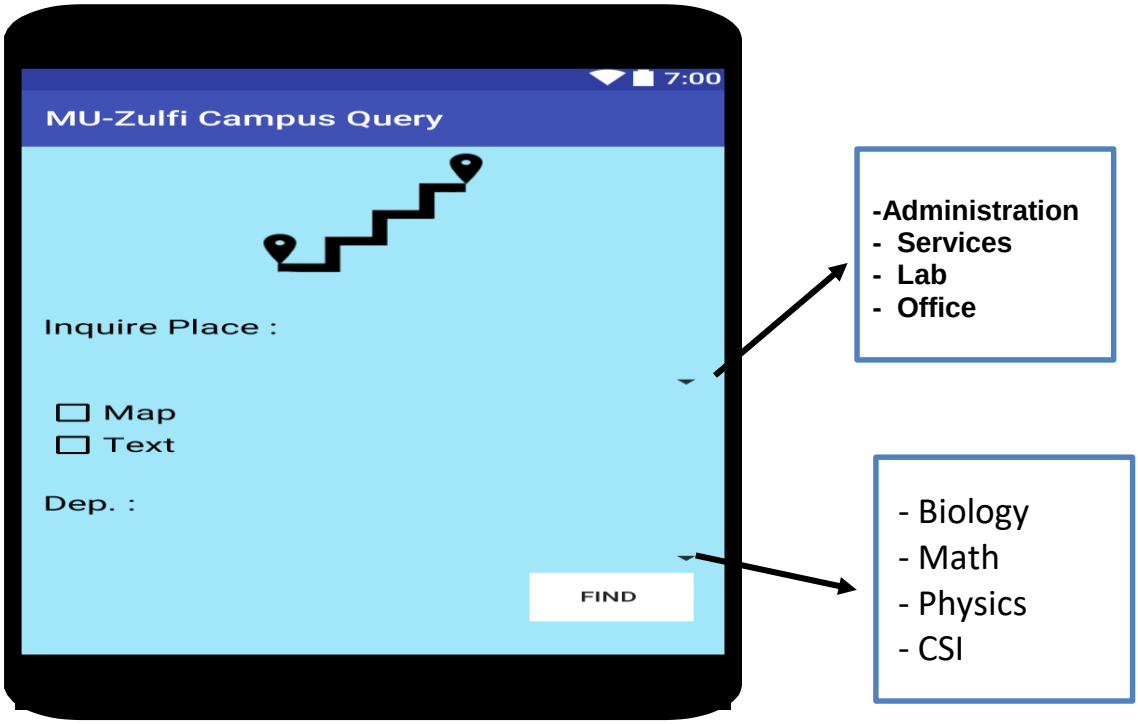
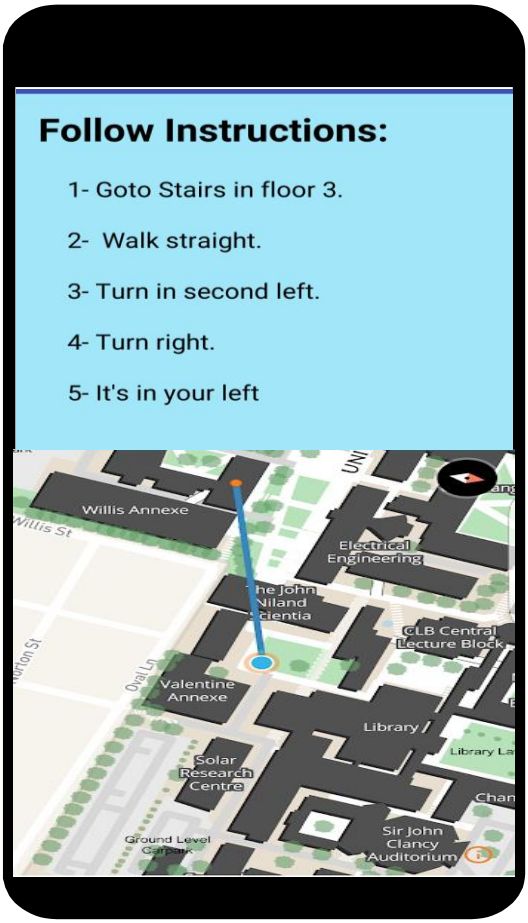


Figure 2. 11 inquire place by map and text



Chapter 3

System Design

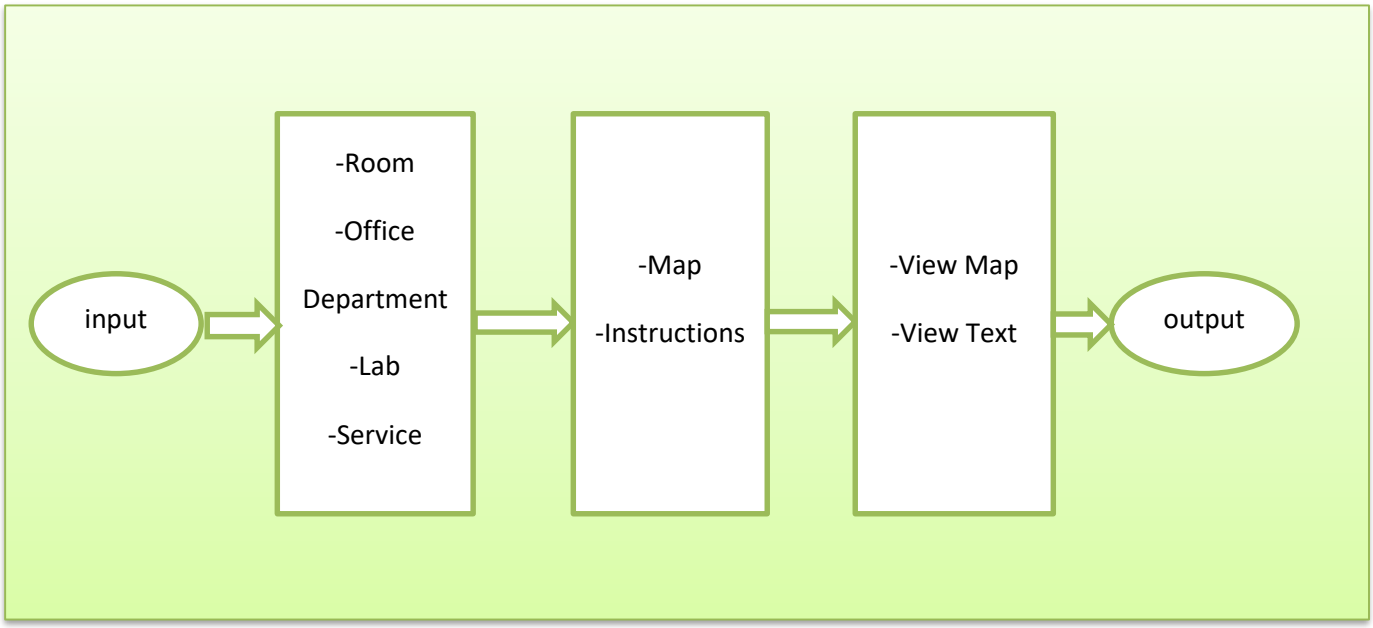


Figure 3. 1 System Design

3.1 Description of all procedures and functions

This section will introduce the main functions of the proposed system in details. Our system has some functions available for new students and visitors to the faculty.

- **Choose floor or layer**

In this function the visitor should provide the system with the current floor 1,2,3 and so on. This process facilitates the process of the getting the desired place easily after this process he should choose the source place.

- **Choose source Place**

  in this function, the visitor should provide the application with the current source place to enable the system to select the best path from the visitor source to the destination he wants in the second function below.

  The current source is the closest room the visitor see in its position.

- **Choose Destination place**

  This function is the main function of the application. When a visitor is existing in the faculty and he cannot find his destination like a laboratory room, lecture room or offices of desired doctor, he can choose his destination from a drop-down menu in the application and click search. After this, the application will show a text containing the path of the destination and then the visitor can view a map for the destination.

3.2 Relation Database Schema

In this section we will describe every table and relationship between database tables

3.2.1 Tables

Table 1. Department Table

Dep_id	Dep_name	Floor	Dep_map	Description

The faculty is consisting of some departments every department has its own rooms, offices and lecture rooms and so on.

In this table Dep_id is the primary key for this table, dep_name is the name of the department and dep_map is the graphical map that enable any visitor to reach this department.

Table 2. Labs Table

lab_id	Dep_name	Map_id	floor	Lab_name	Description

There are many laboratory rooms for every department in the faculty and every laboratory has its own graphical map so, there are relations between the lab and the map table and the department table. Lab_id is the primary key and Map_id is the foreign key.

Table 3. Rooms Table

Room_id	Dep_name	Map_id	floor	Room_name	description

Room_id is the primary key and Map_id is the foreign keys.

Table 4. Offices Table

Office_id	Dep_name	Map_id	floor	Office_name	description

Office_id is the primary key and Map_id are the foreign keys.

Table 5. Administrations Table

Administration_id	Dep_name	Map_id	floor	Adminstration_name	description

Adminstration_id is the primary key and Map_id are the foreign keys.

Table 6. Services Table

Service_id	Dep_name	Map_id	floor	Office_name	description

Service_id is the primary key , Map_id is the foreign keys.

Map Table

Table 7. Map Table

Map_id	type_name	Type

Map_id is the primary key for this table

3.2.2 Attributes

Every table has its attributes or fields. in this section we will describe some of these attributes. Every place in the faculty has some attributes like its id, name, description about this place, graphical map, Department and floor.

The id is the number of this place, the last id number in the table is the total number of rooms, Name is an attribute for the room name like (Physics lab), description contains some information about the place, floor is the layer in which the room is in like layer 1,2,3 and so on, there are some foreign keys most tables like dep_id, map_id and floor_id , map_id refers to the graphical map for this place from the map table.

3.2.3 Relations

Form the following figure you can show relations between the tables above.

Department table

Dep_id	Dep_name	floor	Dep_map	description

Lab_Room

lab_id	Dep_name	Map_id	floor	Lab_name	description

Rooms Table

Room_id	Dep_name	Map_id	floor	Room_name	description

Offices Table

Office_id	Dep_name	Map_id	floor	Office_name	description

Administrations Table

Admin_id	Dep_name	Map_id	floor	Admin_name	description

Services Table

Service_id	Dep_name	Map_id	floor	Office_name	description

Map Table

Map_id	type_name	Type

3.3 Hardware and Software Requirements

In this section we will present the hardware components and software systems we need to use this application. Firstly, the application will be an android application, so it requires a smart phone with android system.

So, the only hardware component is the smart phone and the software is the Android system installed in this mobile.

The software tools that are required in the system Maps of the architectural of Campus :

- PHP language
- My SQL databases
- Android software programs
- HTML Software applications
- CSS
- GPS applications

Figure 3.2 is a smart phones that uses the android system on it to help us achieve our goal.

Figure 3. 2 Android Device

Chapter 4

Conclusion and Future work

5.1 Conclusion

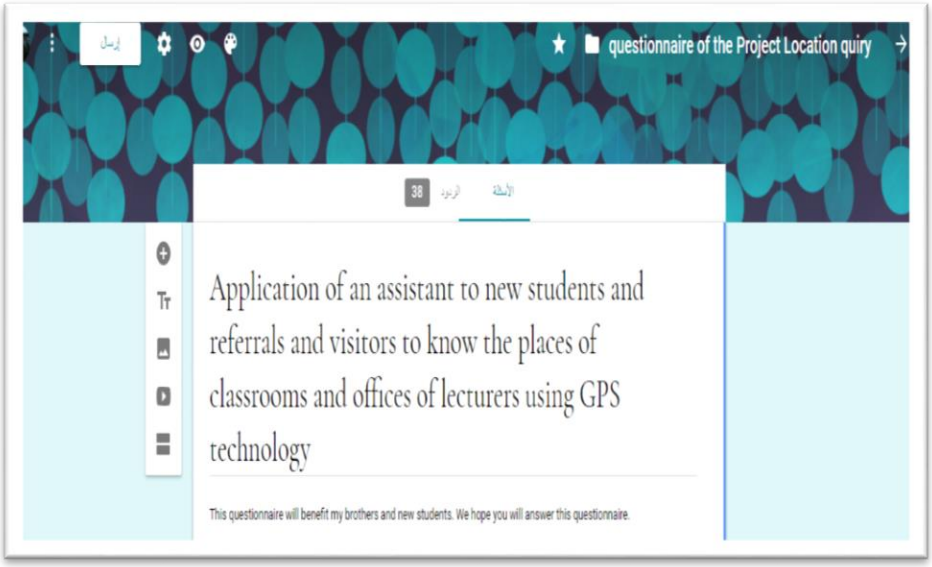
In the end of this project, we implemented an android application that can help strangers, visitors and students of the faculty to know their destination like rooms, offices and lecture rooms in the whole faculty. When the person open the application, the app will ask the person for his source place, he should provide the app with the closest room to his place like room name, office number and so on then, the app will ask the visitor for the destination he need to reach. After then, he should click on the find button. After clicking on the find button, the application will show instructions that the visitor should follow to reach his destination. As well as in the same page he can click on the map button to enable the application to provide a graphical map with paths on it to help the visitor to reach his destination.

5.2 Future Work

- We may Apply indoor navigation with Beacons or other facilities may increase interactivity with the application.
- We can use AR or VR map to increase entertainment and interactivity and make the application esy to use.
- Also, it is interesting to develop the application using other programming languages to be run on different operating systems such as iOS, Windows phone, ……etc.

Questionnaire of project

- Idea of project



- Five questions:

1- Have you ever heard or seen such an idea?

2- Do you think this application will solve a problem?

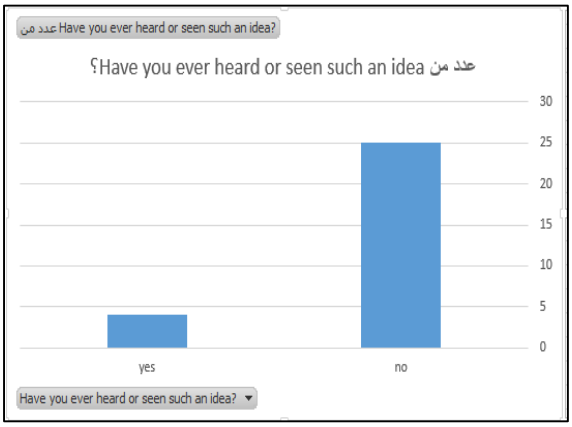
3- Do you think the idea is scalable and will be level on the kingdom?

4- Have you encountered such a problem or anyone you know?

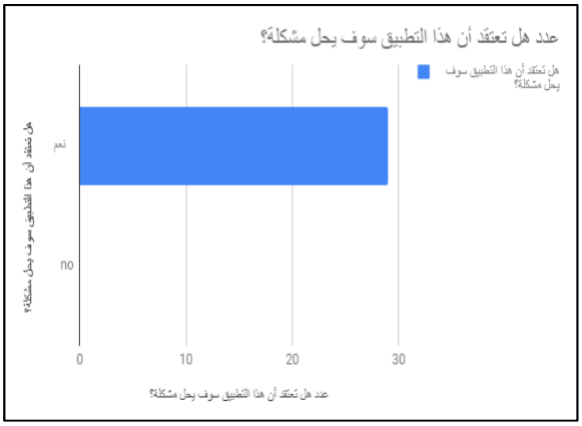
5- Do you have suggestions to add to the project? mention it.

- Analysis

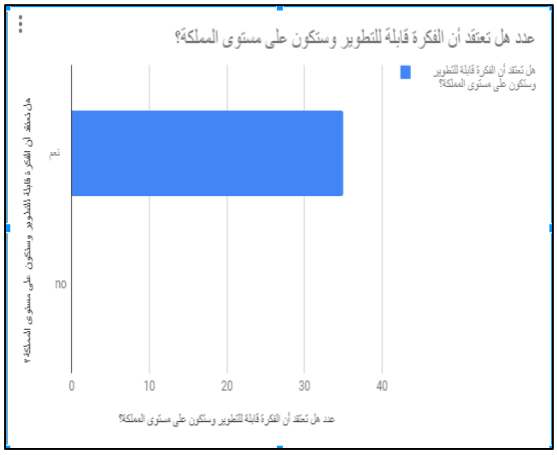
Have you ever heard or seen such an idea?



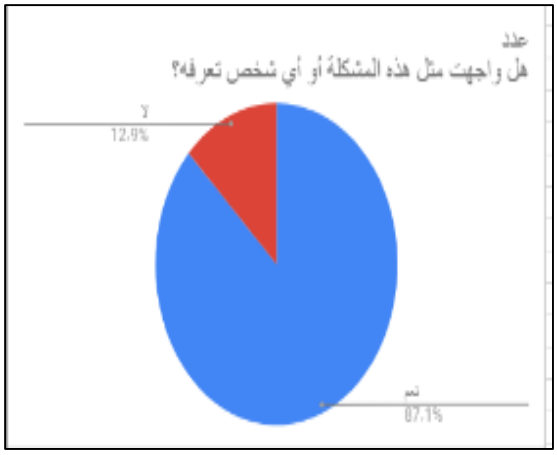
Do you think this application will solve a problem?



Do you think the idea is scalable and will be level on the kingdom?



Have you encountered such a problem or anyone you know?



Do you have suggestions to add to the project? mention it

Do you have suggestions to add to the project? mention it

12 ردًا

فكره جديده وفقهم الله يوفقك
المشروع داجح جدا وفكره رائعه
شكراً الفكره مره مفيده استمر
ان يكون متعدد اللغات
بالتوفيق
اقترح ان تكون الخريطة كالواقع الافتراضي مثل (google earth)
اتمنا منكم الدعم للأخ حمد النعمي
ان يكون هناك برنامج موحد على جميع الجامعات في المملكة .
نعم اتمنا اعتماد البرنامج
اسال الله لك التوفيق
ادخال رقم الشعبة كمفتاح للوصول للموقع
ع

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