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**المملكة العربية السعودية**

**وزارة التعليم العالي**

**كليات المعرفة للعلوم و التقنية**

**كلية العلوم التطبيقية**

**قسم علوم الحاسب والمعلومات**

**Kingdom of Saudi Arabia**

**And the Ministry of Higher Education**

**Knowledge Colleges for Science and Technology**

**Faculty of Applied Science**

**Department of Computer and Information Sciences**

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**GRADUATION PROJECT**

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# Problem definition

## Project Description

## Bakkah to facilitate the transactions of pilgrims during the Hajj season, a wallet is designed to be used for all types of payments, including those made through credit cards. The individual fee can be collected into the Kingdom upon arrival, and the remainder is returned upon departure. Similar to a credit card e-wallet in that it can be linked to a bank account. The electronic wallet mainly contains two components, a program and personal information, and a high security that is not subject to piracy, and a QR is added to facilitate

## Problem Statement

## The dearth of an ATM near to the Haram, the incapacity to swap different currencies and the availability of support for the aging and those with special protests are a few of the issues that have an impact. Fifth Save time for pilgrims., it decreases the probability of theft Helps reduce the risk of theft. .

## Objectives

The main objective of Bakkah is the design of an electronic wallet to preserve the money of pilgrims and provide services that contribute to the goals of the vision in the Kingdom of Saudi Arabia.

The objectives that to be achieved fromBakkah system application are:

* Ease of handling money.
* Easy currency conversion.
* To participate in achieving vision 2030 targets.

## Scope

Analyzing the problem and to assist in drawing, organizing, and knowing the outputs of the system, we need to know the stakeholders.

1. **Clients**
2. **Government (Aljawazat)**
3. **Banks**

The scope will define the boundaries of the application, which include functionalities as the following:

* **User registration**
* To register a new user profile.
* **Technical Linkage with Aljawazat**
* To compare with the Email to verify the identity
* **Email verification**
* To verify the identity of the user
* **QR code generator**
* To generate a QR code every time needed
* **Creating a database to store information**
* **Define the application language**
* **Building the application**
* **Testing for the application**
* **Launching the application**

## Methodology

## The methodology is as follows, the category is determined, and they are Arab expatriates for not knowing the Hajj and Umrah regulations, then the visa number is verified, and then we decide to apply for a special IBAN account number with the bank.

## Functional Requirements

Functional requirements are statements describing tasks and functions that the user can perform, also they capture the intended behavior of system by specifying functions that the system must be able to perform.

1. **Registration:** The pilgrim must register in the application using his email and password.
2. **Linking the IBAN:** Each account must be linked to the IBAN after registration.
3. **Login:** All users who use the application need to log in to their accounts to use the application functions by entering the email, password and the email verification step number entered in the system.
4. **Forgot password:** User can return his password.
5. **Scan a unique QR code:** The customer can scan a unique QR code after successfully completing the email verification step, and this code will be used to withdraw the required amount and take advantage of other features in the application.
6. **Show QR Code**: The app will display the generated QR Code to be scanned at the selected location.
7. **Terminating the QR code:** When the time set to the QR code ends or the QR code has been scanned, the QR code expires, to prevent using the QR code again.
8. **Comparison of information with (Passports):** Compare the visa number that has been set with the national number of each pilgrim every time he logs into the application and generates a QR code.
9. **After completing all the previous steps:** the country will be selected, and it will automatically convert to the riyal

## Non-Functional Requirements

The non-functional requirements are the features to be in the system which used to obtain more efficiency. They include:

**Security**

* + New registration in the app.
  + Connecting the system to a Aljawazat
  + Connecting the system to a personal email.
  + International bank account.
  + Passwords consist of 8 characters and contain large letters and numbers.
  + The system will carry a user account 7 days when logging in and creating a QR code.
  + Before creating any QR code, there must be a step to verify the user's identity that includes a code sent to email.
  + Every QR code expires after 20 seconds.
  + Every QR code generated is different to enforce security.

**Usability**

* The user should be able to submit any request within 3 or 4 steps maximum.
* The user should be able to learn to use the system within 20 minutes.

**Privacy**

* The app requires the username, password and email sent when login.
* The system must keep information confidential so that other users are not allowed to view the information.

**Availability**

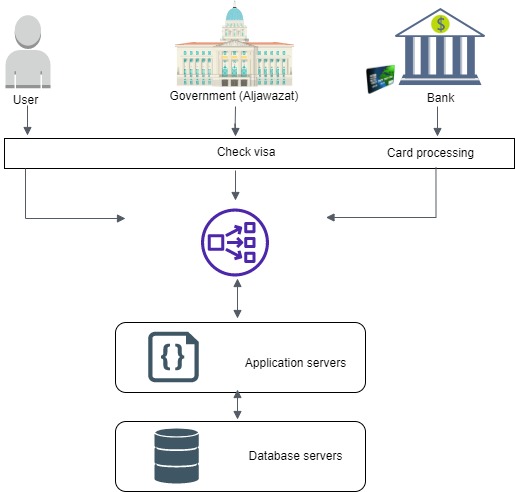
* The system should be available for 24 hours/7 days a week.

**Performance**

* Response time should be fast, so the user should be able to moves between system pages in few seconds**.**
* The system's response time is quick to retrieve and compare the data to generate the QR code in a quick manner.

## System Context View

Person (user) visits a Mecca To perform Hajj or Umrah The application is downloaded through his phone for Create or import e-wallets. The he person (user) logs in to the application. He enters the visa number his to verify the data. Thae's Linking king the IBAN and The money that is added to the wallet is automatically transferred to Saudi riyals. The functions that the user can perform, money can be saved and retrieved in the future and Send money to other addresses.



## Challenges

There are challenges that we might face in this project like learning how to use some of new methods, skills or programing languages for example:

* Learning a new application coding language to develop the application.
* Looking and using the simplest yet best tools for constructing and analysis to minimize the time cost .
* Communication and linkage with the government (Aljawazat).
* IBAN processing and linkage with the bank.
* Generate QR Code .
* Some research on the project points.

## Projections

## Know the people who are interested in the project idea, and contribute to their own expectations. Implementation of a good appropriate plan, taking care to announce the objectives of the project. Possess a culture that cares about achieving the project's goal. Relying on a committed, efficient and committed team. Building good communication channels. Use case diagram

## From describing the functions of the system from the user's perspective and defining each function of the operator or operator Study of prospective customers The project owner studies the desires and needs of potential customers, their numbers, descriptions, and whereabouts, in order to match the project’s products or services that will be offered in the target market, where knowledge of the customer is the basis for the success of any project Describe the environment in which the system will operate, such as interfaces with power sources, other equipment, software, databases, and users. Safety requirements may be included in the operating environment for the purposes of the system requirements report .

## Project time line

We made a plan for the entire project, including all the sub task that we need to complete in this project, shown in the table below:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Task | Duration | Start | | Finish | Resource |
| 1 | Bakkah Application | 2 days | Tuesday  6/9/2022 | | Wednesday  7/9/2022 | Bushra , Shorouq  Abrar , Lama |
| 2 | project proposal | 3days | Thursday  8/9/2022 | | Saturday  10/9/2022 | Bushra , Shorouq  Abrar , Lama |
| 3 | **Chapter 1** | **20 days** | **Sunday**  **11/9/2022** | | **Friday**  **30/9/2022** | **Bushra , Shorouq**  **Abrar , Lama** |
| 4 | Project Description | 1 day | Sunday  11/9/2022 | | Sunday  12/9/2022 | Bushra , Shorouq  Abrar , Lama |
| 5 | Problem Statement | 1 day | Monday  12/9/2022 | | Monday  13/9/2022 | Bushra , Shorouq  Abrar , Lama |
| 6 | Objectives | 1 day | Tuesday  13/9/2022 | | Tuesday  14/9/2022 | Bushra , Shorouq  Abrar , Lama |
| 7 | Scope | 1 day | Wednesday  14/9/2022 | | Wednesday  15/9/2022 | Bushra , Shorouq  Abrar , Lama |
| 8 | Methodology | 1 day | Thursday  15/9/2022 | | Thursday  16/9/2022 | Bushra , Shorouq  Abrar , Lama |
| 9 | Functional Requirements | 2day | Friday  16/9/2022 | | Saturday  18/9/2022 | Shorouq |
| 10 | Non-Functional Requirements | 1 days | Monday  18/9/2022 | | Monday  19/9/2022 | Bushra |
| 11 | System Context View | 4 days | Monday  18/9/2022 | | Thursday  22/9/2022 | Abrar |
| 12 | Challenges | 4 days | Monday  18/9/2022 | | Thursday  22/9/2022 | Abrar |
| 13 | Projections | 2 days | Friday  23/9/2022 | | Saturday  24/9/2022 | Lama |
| 14 | Project time line | 1day | | Saturday  24/9/2022 | Saturday  24/9/2022 | Bushra, Shorouq |
| 15 | Presentation | 4 days | | Sunday  25/9/2022 | Friday  30/9/2022 | Bushra , Shorouq  Abrar , Lama |

# System Architecture document

## Introduction

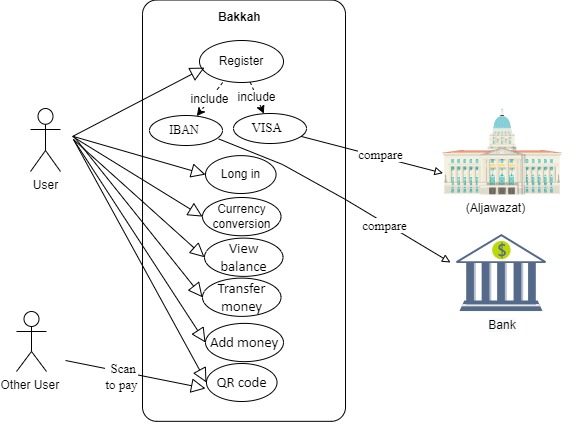
This chapter contains many of important topics with related subjects, these subjects are: (System Architecture, Design decisions, Domain model, Architectural Style, Structural model).To their importance for considered the building blocks for application to be implemented, and finally we will depict some diagrams, to illustrate the functionality of the application.

## System Architecture

## System architecture is a compact, manageable description of how a system is organized and how the components inter operate. The system architecture is often the same for systems with similar requirements.

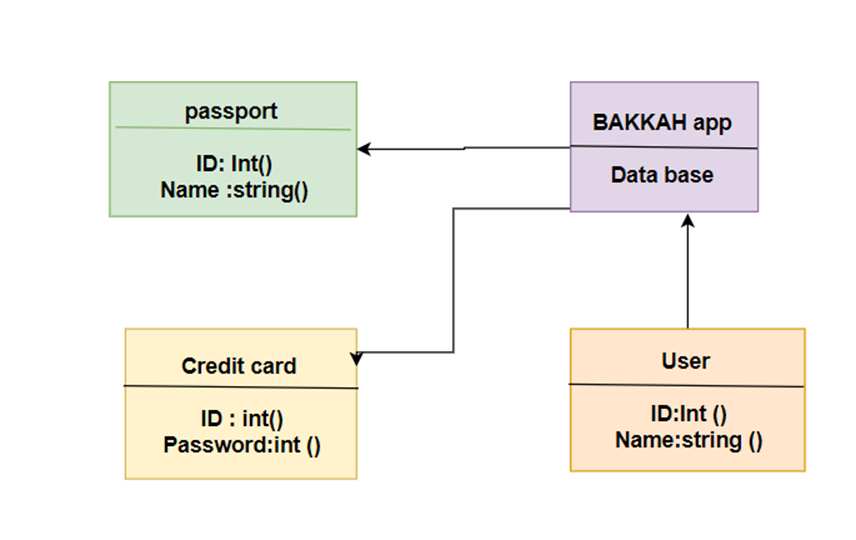
## Use case diagram

A use case is a method that used in the system analysis to model the requirements of the system. The use case is involving of a group of processes that interact with the systems. The predictable users are show in determined environment and related to a particular objective. It offers a group of components that can be used together. The use case should describe all system activities that have relations to the users as show in Figure **.**

****

## 

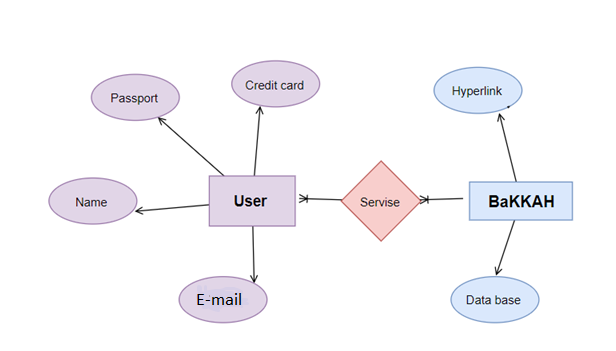
## Class Diagram



## Structural model

## 

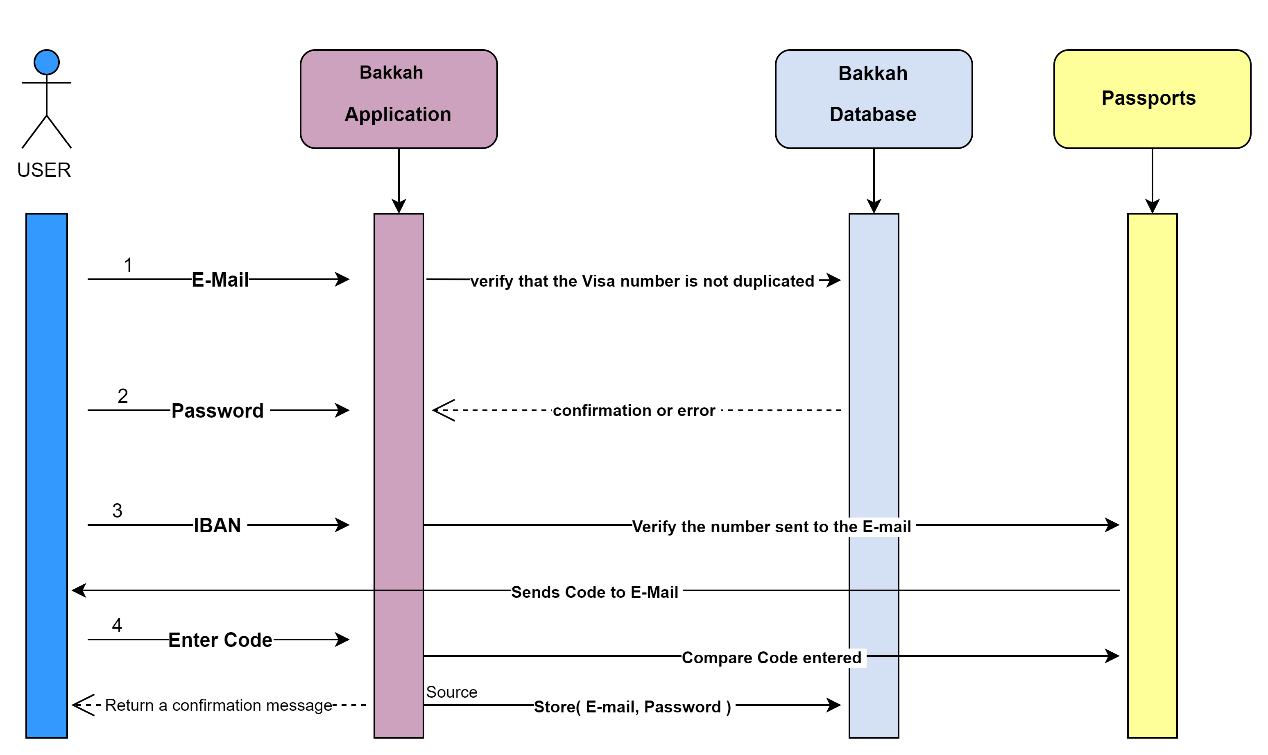
### Entity Relationship Diagram (ERD)

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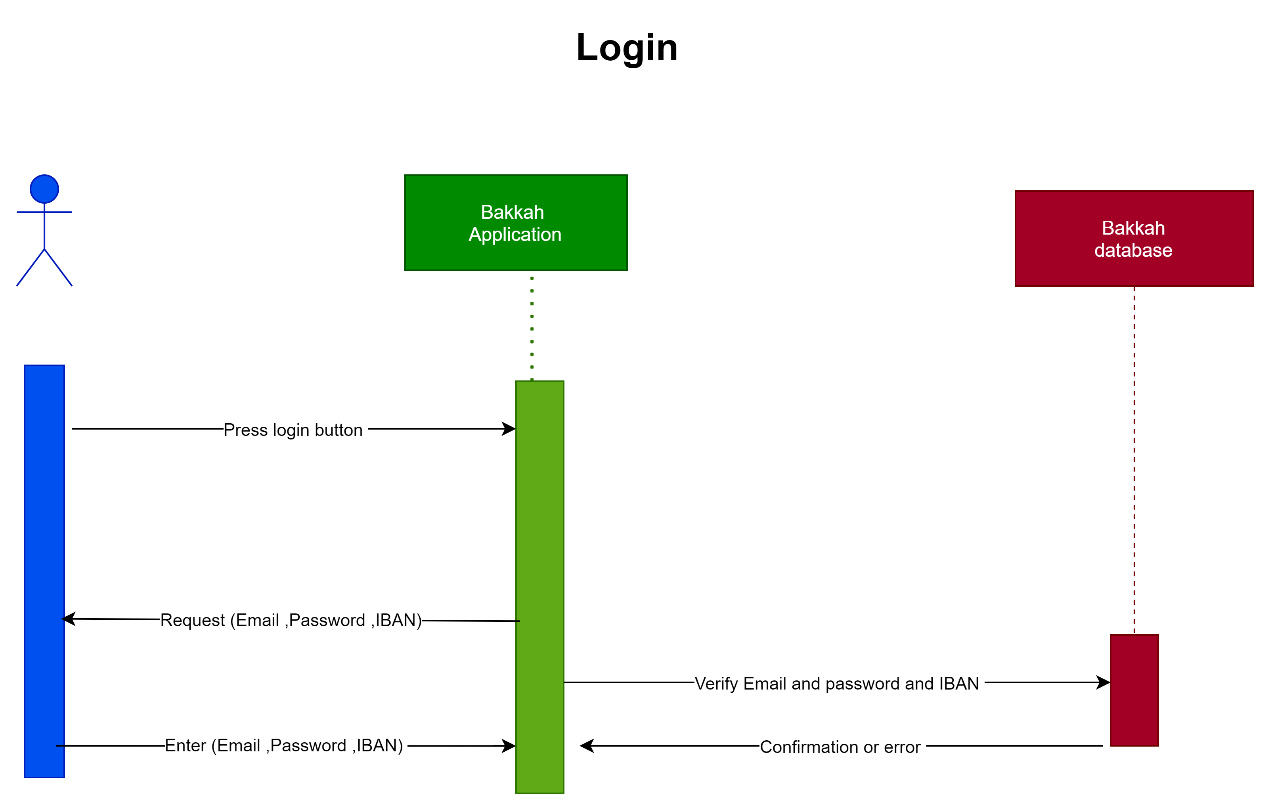
## Sequence Diagram

Sequence diagrams are interaction diagram that displays how processes work with one another and in what order. It is a construct of a Message Sequence. A sequence diagram displays object interactions arranged in time sequence. It shows the objects and classes involved in the scenario and the sequence of messages exchanged between the objects. It needed to carry out the functionality of the scenario as show in Figures

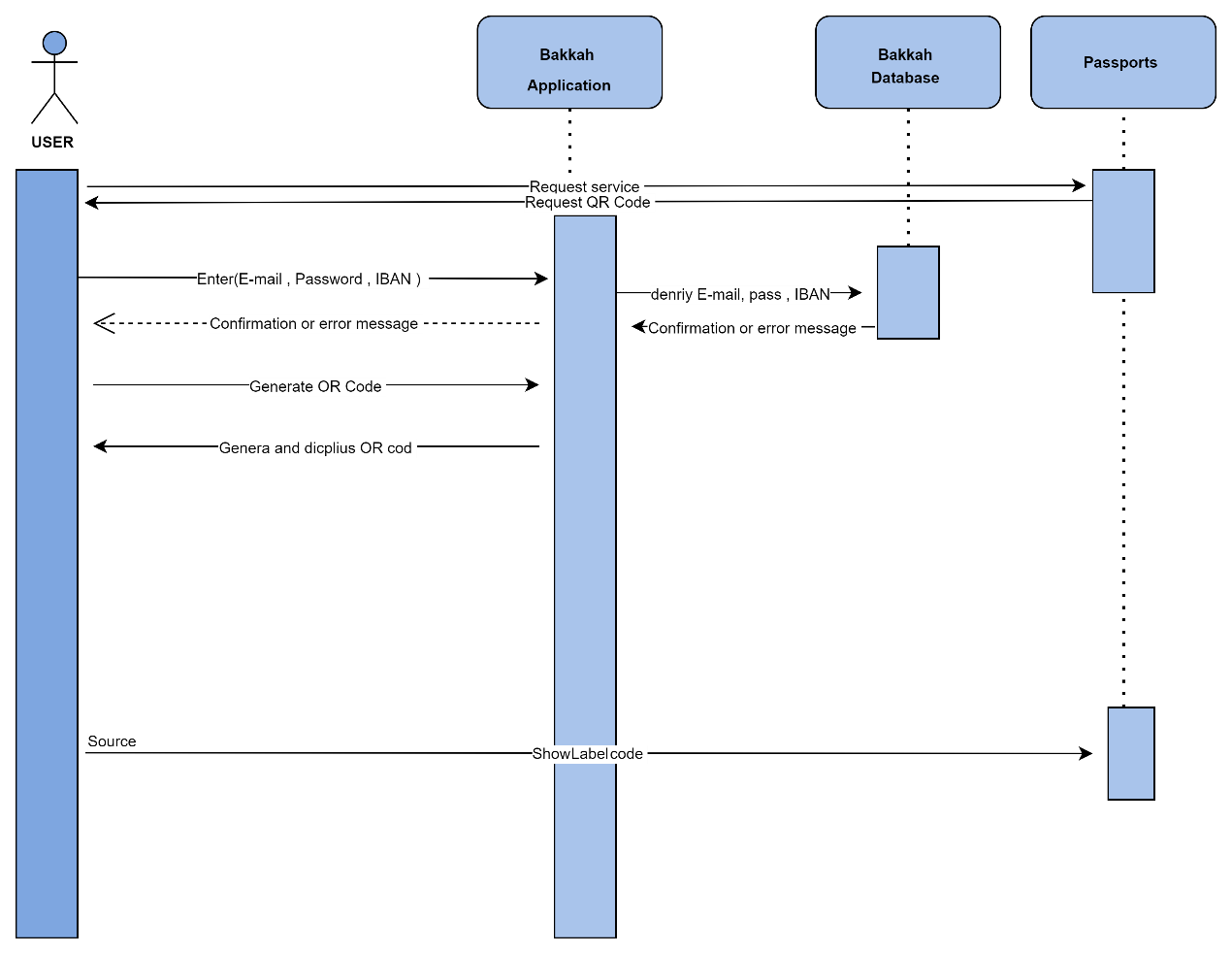
### User registration sequence diagram



### User login sequence diagram



### Generating a QR code for Insurance card sequence diagram



# System Design Document

## Introduction:

## This section focuses on completing the system's illustrations and explains the use case description as well as the system interfaces for each user and also contains implementation consideration.

## Use case documentation

|  |
| --- |
| Register |

|  |  |
| --- | --- |
| Actors | User |
| Objective | Creating a new User account in the database |
| Pre-condition | The filled information should be checked and validated. |
| Post-condition | The new user account after the condition is stored in the emaildatabase. |
| Primaryscenario | User presses Register button.User enters all the required information.User presses Submit button.The system checks the filled information.The system requests the code sent to the user from the Passports.The system responses with a confirmation message and creates the account. |
| Alternativescenario | User presses Register button.User enters all the required information.User presses Submit button.The system checks the filled information.The system asks for the code sent to the user from passports.The system responses with an error message about some filled information. |

|  |
| --- |
| link email |

|  |  |
| --- | --- |
| Actors | User |
| Objective | Link the created account to your personal email |
| Pre-condition | Prerequisite Email must be verified |
| Post-condition | The email is linked to the user's account |
| Primaryscenario | The system asks the user to put a personal email to link it to his account.User sets personal email.The system verifies the personal email.The system responds with a confirmation message and links the personal email to the account. |
| Alternativescenario | 1. The system asks the user to put a personal email to link it to his account. 2. User sets personal email. 3. The system verifies the personal email.  The system responds with a confirmation message and links the personal email to the account. |

|  |
| --- |
| Login |

## 

|  |  |
| --- | --- |
| Actors | User |
| Objective | Login to the system |
| Pre-condition | The filled information should be checked and validated |
| Post-condition | The user enters the system |
| Primary scenario | The user fills in the personal email and password2-The system checks the filled in information3- The user logs in successfully |
| Alternative scenario | 1. The user fills in the personal email and password2. The system checks the filled in information3. The system shows an error message and asks theuser to re-enter his information |

|  |
| --- |
| Generating QR code |

|  |  |
| --- | --- |
| Actors | User |
| Objective | Generate a QR code |
| Pre-condition | IBAN verification step for personal bank account |
| Post-condition | The user generates a QR code |
| Primary scenario | 1. The user logs into the system successfully2. User clicks Generate QR Code3-The system checks whether the email entered matches the email saved in the system previously4-The system retrieves the information and generates a QR code |
| Alternative scenario | 1. The user logs into the system successfully2. User clicks Generate QR Code3-The system checks whether the email enteredmatches the email saved in the system previously4-The system retrieves the information and generates aQR codeThe system returns an error message |

## Class diagram documentation

**User class:**

Attributes:

* Visa number: The visa number of the person.
* Password: The password of the account .

Methods:

* Verify login: This method does the login operation to the application
* Logout: This method does the logout operation from the application
* CompareCode: This method compares between the mobile code sent to the user with the code that the user entered.

|  |  |
| --- | --- |
| Class | User |
| Attributes | * National ID: The national ID of the person * Password: The password of the account |
| Methods | * Verify login: This method does the login operation to the application * Logout: This method does the logout operation from the application * CompareCode: This method compares between the mobile code sent to the user with the code that the user entered |

**QR class:**

Methods:

* Generate: This method generates the QR code
* Display: This method displays the QR code
* Terminate: This method terminates the QR code

|  |  |
| --- | --- |
| Class | QR |
| Methods | * Generate: This method generates the QR code * Display: This method displays the QR code * Terminate: This method terminates the QR code |

**Class Insurance:**

Methods:

* Retrieve Data: This method retrieves the needed data to generate the QR code from the insurance company

|  |  |
| --- | --- |
| Class | Insurance |
| Methods | •Retrieve Data: This method retrieves the needed data to generate the QR code from the insurance company |

**Class Aljawazat:**

Methods:

* Verifymobilenumber: this method sends a code to the user's mobile number

|  |  |
| --- | --- |
| Class | ABSHER |
| Methods | * Verifymobilenumber: this method sends a code to the user's mobile number |

## Activity Diagram

## Interfaces

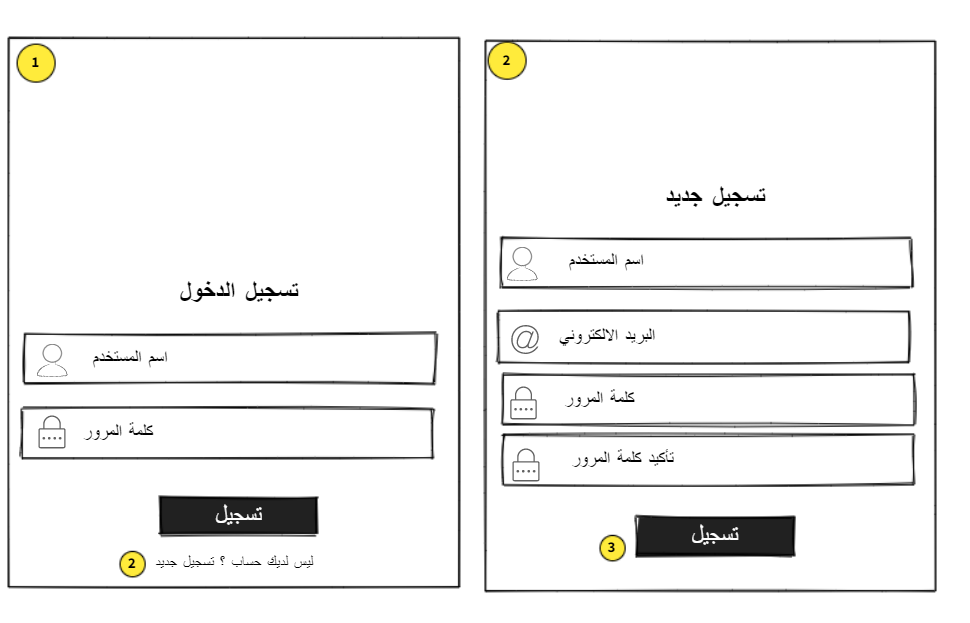


Figure Interfaces-LoginOrReg and Interfaces-NewReg

This interface shows two buttons, the first one is to login and the second one is to register.

Shows a Register screen. In this figure, this interface dedicated to registration in application, Registration is done by filling the following fields: username, password, ande-mail.

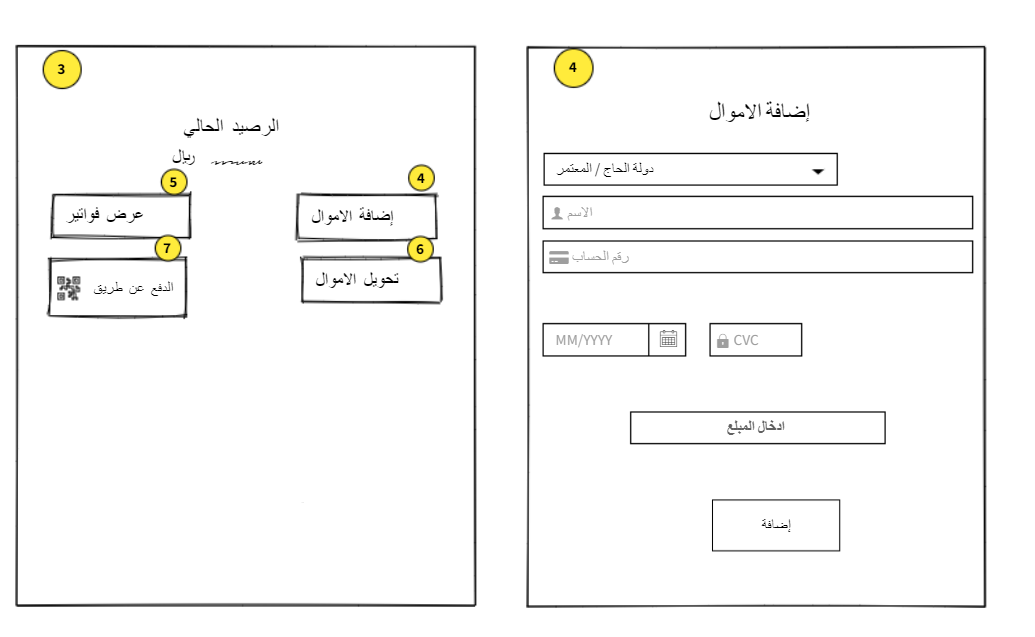


Figure -Interfaces-MainPage and Interfaces-AddMoney

This interface shows the main page that contains four buttons :Add money ,View invoices , money transfer and pay by QR code.

Shows a Add Money screen. In this figure, this interface dedicated to Adding Money in application, Adding is done by filling the following fields:

User country , name, card no , expiry date , ccv and Enter an amount.



Figure Interfaces-View invoices and money transfer.

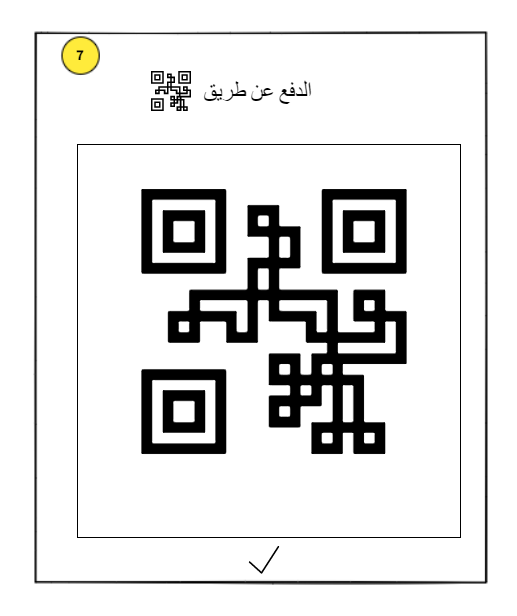


Figure 4 pay by QR code

## References

## <https://mockflow.com/>

## <https://www.diagrams.net/>