**IEEE**                                                                                          **UAE**

**17ᵗʰ IEEE UAE STUDENT DAY COMPETITIONS**
**Academic year 2022 – 2023**
**Software Engineering Project (SEP) Competition**

# Family Banking System

## I.     Competition Rules

1. Only **IEEE UAE Students Members** are eligible for this competition.
2. Each institution can submit a maximum of two entries in this competition.
3. Each competing team shall have no more than four students.
4. The contestants shall not use any unauthorized or unlicensed software.
5. The source code and all relevant documentation shall be made available to the competition coordinator and the judges on the day of the competition.
6. Salient features of the software shall be documented with the aid of an A1 size Poster. A brief user manual shall also be provided.

## II.     Project Summary

The usage of online banking became one of our daily life routines. The ability to transfer money, pay the bills or even use the smartphone as an e-Wallet has never been easier.
In this project, students are required to demonstrate their skills in software to develop a user-friendly banking system. The system is accessible using a website and a mobile application, each developed separately but reads/writes data from the same database and is equipped with a chat bot that assists the user in making their decisions.

## III.     Technical Specifications

Students are required to develop all the features to be accessible through the website and mobile application (excluding e-Wallet which is for the mobile application only).
The system will rely heavily on accessing and storing data in the same database, it should be easy to handle with the ability to do the following features:

## 1) Sign In/Sign Up

While accessing online banking for the first time, the user will be requested to fill in their personal information; including **username**, **full name**, **date of birth** and **mobile number**.

Assuming that each mobile number is pre-linked with the registered credit card number (through the database as illustrated below), the user will receive an **SMS message** after submitting their information that will include a generated password for the provided username to access the system (both website and mobile app).

| Database Table | |
| --- | --- |
| *Field* | *Requirement* |
| Credit Card | 16-Digit Number |
| Mobile Number | 10 Number |

## 2) Add Family Members

This feature should be available for the main user only, who owns the credit card (not all family members), using this feature the user will be able to add a new family member to share the credit card with.

The user is requested to provide the new members **username**, **full name**, **date of birth, privilege status** (*Main user or sub-user*) and **mobile number**.

- *Main user:* Will receive full access to the credit card; such as two parents sharing the same credit card, they will both have the same privileges over the card.
- *Sub-user:* Will receive limited access to the credit card; such as children where their accessed features will be provided in an explanation table below.

Once submitted, the new member's mobile number should be linked with the same credit card with the privilege status.

## 3) Automatic Salary

To mimic banks transactions, an automatic salary of **7,000 AED** should be added monthly to the bank account. This should be developed in the mobile application code.

## 4) Pay Bills

This feature should allow the user to pay monthly bills such as (electricity, water, Internet, etc.). An additional option should be available to request monthly automatic payment of the selected bill.

## 5) Add Debits

This feature should allow the user to add pending debits amount, payment installment per month and an appropriate title. It should also ask for the final date to fulfill this debit.

## 6) Allowance

Parents (with main user privilege) should be able to assign monthly allowance for their children. Additionally, this feature should allow instant transfer if needed.

## 7) Birthday Gift Voucher

The system should check when any family member's birthday is coming soon (2 days earlier), and notify the user through a notification message once the mobile application is logged in. This feature will allow the desired money transfer on the birthday date.

## 8) e-Wallet

This feature should be added to the mobile application only. Once the user accesses this option, payment should be allowed though Near-field communication (**NFC**). Students should include NFC library in their developed code, that will read from any NFC tag and process a FIXED transaction of 20 AED.

NFC tags will be provided during the competition to simulate the transaction.

## 9) Statement

This feature should show all the transactions done by the users. Based on the privilege status, the user will be able to view the transactions made.

- *Main User:* Should be able to see all transactions.
- *Sub-user:* Should be able to see their transactions only.

**10) <u>Chatbot</u>**

This feature should be an interactive user-friendly chatbot. The main user should be able to ask the chatbot to calculate how much it is safe to spend from the salary.

For example, if this is the current status of the user:

| Amount in the Bank | Salary/ month | Internet Bill/ month | Water/Elect. Bills/ month | Other Expanses/ month | Debits/ month |
|---|---|---|---|---|---|
| 20,000 | 7,000 | 300 | 1,000 | 2,000 | 1000 |

This means the chatbot should display the following:

- Amount Safe to Spend (20,000-4,300) assuming that the total amount in the bank already includes the salary.

- Notify the user of the next salary release day (20,000+7,000-4,300).

| Amount Safe to Spend | |
|---|---|
| **Amount Safe to Spend** | **Notification of the amount when the Salary is released** |
| **15,700 AED** | **12/10/2019 - 22,700 AED** |

Both calculations should be displayed for the user at the same time.

## IV.  System Overview

| Features | Accessibility (Website/Mobile App) | Privilege Status |
|---|---|---|
| **Sign In/Sign Up** | Both | All |
| **Add Family Members** | Both | Main Users Only |
| **Automatic Salary** | Mobile App Only | Main Users Only |
| **Pay Bills** | Both | Main Users Only |
| **Add Debits** | Both | Main Users Only |
| **Allowance** | Both | Main Users Only |
| **Birthday Gift Voucher** | Both | Main User Only |
| **e-Wallet** | Mobile App Only | All |
| **Statement** | Both | All* |
| **Chatbot** | Both | Main User Only |

\* Main users can view full account statement, while Sub-user can only view their statement.

**<u>Note that:</u>**

- The same online database should be used for storing and accessing the data through the developed website and mobile application, students have the ability to be creative and add as many fields in the database as they desire (*as long as the requested features function*).

## V.     Poster and User Manual

The students are required to provide:

- A brief user manual.

- An A1 size poster to provide a concise software description and depict the technical specifications / methodology / tools / techniques used in the development of the system.

## VI.     Testing Procedure

Each team must provide the smartphone device with the executable for the mobile application installed (supports NFC) and a laptop to display their developed website.

The judges will provide the students with the input variables mentioned earlier such as salary amount, current bank amount, number of family member, allowance, bills, etc. to demonstrate their functionality. Alongside NFC tags.

*Note that*, the NFC tags will not have any data inside, it is just to trigger the mobile application to issue a fixed rate transaction of 20 AED.

## VII.  Evaluation

A panel of three judges, to be selected by the IEEE UAE Students Day Steering Committee, will assess the entries of the competition. The competition criteria that will be used for judging the entries are given below:

| No. | Evaluation Criteria | Weight Distribution | Weight |
|---|---|---|---|
| 1 | **Functionality** | • Sign In/Sign Up (5%)<br>• Add Family Members (5%)<br>• Automatic Salary (5%)<br>• Pay Bills (5%)<br>• Add Debits (5%)<br>• Allowance (5%)<br>• Birthday Gift Voucher (5%)<br>• e-Wallet (5%)<br>• Statement (5%)<br>• Chatbot (10%) | 55% |
| 2 | **Theoretical Knowledge** | | 10% |
| 3 | **User-friendly Interface** | | 10% |
| 4 | **Additional Features** | | 15% |
| 5 | **Poster and User Manual** | | 10% |
| | **Total** | | **100%** |