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Software Graduation Project

KANRI

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# Acknowledgement

“

*In the name of Allah the Merciful, Praise be to God who gave us the strength, ability, and acknowledge to complete this project. We would like to thank our supervisor, Dr. Raed Al-Qadi, for his effort and support during the project execution process in order to reach this achievement. We are also grateful to the doctors at the Department of Computer Engineering, who have had a significant impact on our ability to reach this point. Last but not least, we thank our family and friends who were with us at every moment for their moral support.*

”

*- Maya, Israa*

# Disclaimer

This report was written by students **Maya Yacoub** and **Israa Shtayeh** of the computer engineering department at An-Najah National University. It may have grammatical and content mistakes. An-Najah National University has no responsibility for any mistake in this report. Moreover, it bears no responsibility for any misuse of it for purposes other than those for which it was written.

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# Abstract

Project management is considered one of the main factors for project success based on prior planning and coordination as it plays a great role in preventing many of the project's obstacles and challenges. Because life is taking a great turn towards collaboration to accomplish various projects like university students and organizations who may need to communicate with individuals overseas in a timely and effective manner, project management tools and software have become essential. However, the ones that are available are prohibitively pricey and complicated for ordinary people.

KANRI project seeks to provide a user-friendly application and website that makes it simple to manage projects and deliver them on time by allocating tasks to suitable people with profiles that detail their work domains and projects. Furthermore, each task's execution progress can be tracked. Additionally, using internal and group chats, all users can effortlessly communicate with one another. Users can also be clients looking for people to complete projects for them according to their project field, providing a project brief as well as price and deadline considerations. To enhance client satisfaction, they will receive frequent feedback on the project's progress and will be able to join meetings hold by the working team.

The project is constructed on the Visual Studio code framework, using libraries based on JavaScript where the mobile application was built using the React Native library and the website using React representing the front-end. While the server-side was developed with Nodejs as the back-end. For the database, we used 2 types which are Mongoddb and Firebase.

As a result, Kanri will be available for Android users. Anyone can create an account by submitting personal, academic, and field of interest information. Each user has a profile that contains his information as well as projects that he has established and joined, in addition to the ability to contact him. The user can establish his own project, identify team members, assign tasks, organize meetings, request to join any project, accept or reject invites to projects, act as a client requesting others to complete his projects, and track the progress of his projects' execution. The website will show projects analysis. All these characteristics serve to achieve the goals of helping people in managing their projects leading them to success.

# 1

## Introduction

### 1.1 Problem Statement

Developing a user-friendly, flexible, and free online tool to help in the management of the entire execution progress of projects by:

- University students:
  - Team members may not have any idea of all the tasks of the project.
  - Leader may not be able to keep track of the entire progress of the project.
  - Overload on the leader to distribute tasks on the team. In addition to sharing out any modifications.
  - The lack of a common interface for communication between students.
  
- Online teams:
  - Facing some problems in finding the team members in a specific field.
  - The lack of a common interface for communication between the overseas members.
  - The hardness in tracking the project execution process remotely.
  
- Users who want to start a project being the leader:
  - Facing some problems in finding the team members in a specific field.
  - The difficulty in distributing and tracking the total budget and the cost of each task.

- Users who want to join projects:
  - Not being able to see which projects are being created by other users.
- Customers who want to find someone to do project for them:
  - Facing some problems in finding someone in a specific field to be the leader.
  - The difficulty in continuous reporting of the project implementation path to the customer.

## 1.2 Project Objectives

The aim of KANRI is to satisfy the end user's need for a user-friendly, flexible, and free online tool to help in the management of their projects. We will offer all of this in addition to the ability to communicate just like other social media.

- University students:
  - Team members will follow up with all the tasks and be notified of any changes in their status.
  - The project leader will be in charge of keeping track of the project's progress.
  - The leader is responsible for assigning tasks to the team. In addition to disseminating any changes.
  - Students will be able to communicate with one another via individual and group chats.
- Online teams:
  - Users can be filtered by their fields of interest, and their profiles can be visited to get a sense of their work.
  - Individual and group internal chats are available.
  - The ability to keep track of each project task's execution and status.
- Users who want to start a project being the leader:
  - Filtering the users by the fields of interest, and the ability to visit their profiles to have an idea of their projects.
  - Allowing the user to assign the cost of each task considering the knowledge of the remaining budget.

- Users who want to join projects:
  - The users can follow each other, in order to follow up with the newly created projects.
  - The home page will list all of the user's freshly created projects.
- Customers who want to find someone to do project for them:
  - Search for a leader by name, email, or field of interest and has the ability to visit his profile to have an idea of his projects.
  - Continuous contact between the customer and team members is available. Furthermore, the opportunity to participate in meetings and track the execution progress.

## 1.3 Project Scope

The project scope is general, anyone who is interested in creating projects or working within a team will be able to be a user and benefits from all the features provided.

## 1.4 Project Significance

As previously stated, project management is vital in our lives since it leads to success via preparation and collaboration. KANRI provides all the characteristics related to this to make the process of creating projects, inviting members to join, assigning tasks to members, tracking progress, and facilitating requests to join projects and requests to do projects easier.

## 1.5 Report Organization

- **Constraints, Standards and Earlier course work** representing the second section of the report which will discuss the project's constraints and limits, standards that were followed and used. Finally, introducing the earlier taken courses which were beneficial in finishing the project.
- **Literature Review** representing the third section which will mention some related words similar to our project idea and demonstrate the main differences between them.

- **Methodology** representing the fourth section which will explain how feature were implemented. furthermore, showing the methods, tools, and languages where used.
- **Results and Discussion** representing the fifth section which will show the project's results and provide enough detail to substantiate the conclusion.
- **Conclusion** representing the last section which will outline the entire project, as well as the end results, and will demonstrate what we learnt along the way. It will also present some of the upcoming work in this project.

## 2

# Constraints, Standards and Earlier course work

## 2.1 Limitations & Constraints

### 2.1.1 Limited Time

The allotted time for planning and executing the project is just four months, which includes the time needed to study the idea of the project and learn new programming technologies, as well as deal with new databases, which took the proper amount of time to handle flexibly. During the semester, the project was implemented with the rest of the courses, which required more effort.

### 2.1.2 Limited Resources

The documentation required to work with React Native and React, as well as Databases, MongoDB [1], and Firebase [2], were limited and did not contain all of the necessary information. As a result, we had trouble handling some errors and had to deal with them by trying and testing.

## 2.2 Standards / Codes

### 2.2.1 GUI front-end

React Native was used in designing the application's GUI, as well as some npm libraries [3] to handle the project's functions. The website's front-end is built with React. The flexibility of these libraries being open source frameworks based on JavaScript programming language, as well as the ability to break the code into components, construct our own

components, and reuse the built components, helped to deal with the whole implementation process.

### 2.2.2 Back-end

The server side was written using [4]Node.js which mainly connect the front-end with the database. Node.js is an open source run-time environment executing JavaScript to implement the server for the application and the website. Its characteristics drew us in, such as the ability to handle numerous requests to the server without having to manage threads. Moreover to its elasticity and the ability to use a large number of open-source npm packages.

MongoDB and Firebase are the databases used. MongoDB, known as a NoSQL database, stores data in documents, leading it to scalability and flexibility than relational databases. This library is used to store the data for each user. While Firebase is used for real-time chat and stores the notifications where less time and less effort to deal with it that will improve the quality overall.

## 2.3 Earlier coursework

The previous classes we took in the computer engineering department helped us get to this point and construct a comprehensive application front-end and back-end, including Object Oriented Programming(JAVA), software, database, Web Programming, Algorithms, and critical thinking. In addition to "Management of information technology (IT)" course which aided in the first place understanding the concept of project management. We also learned about React Native [5], React [6], Node.js, MongoDB, and Firebase from online courses and documentations.

# 3

## Literature Review

The project management platform plays an essential role in organizing the work between the team members. It is a straightforward method for providing the project manager sufficient feedback regarding the project's development progress.

Many applications are interested in this concept like **Asana**, a platform that provides a tool for project management. We are aware that project's leader is continuously looking for the right person with the right abilities and knowledge to complete the tasks. In the **Asana** program, there is no method to find an appropriate member to do the task, since users are unaware of one another, and their projects.

The same as **Monday** application. Furthermore, customers contribute to the project's success by offering regular recommendations to team members and reviewing accomplished work. To establish trust between the customer and the work team, the customer should keep track of the process and results, as well as attend meetings set up by the project leader. **Monday** is one of the few programs that is solely focused on project and team management, regardless of project customer, resulting in a lack of customer service.

Students typically want applications that are simple to use and require minimal time and effort to master. Most apps require lengthy training and tutorials before they can be used, and **Zoho** is one of the applications with many capabilities that are tough to find and use. Moreover, users unfamiliar with the **Microsoft dynamic 356** platform may struggle to navigate and keep track of the process execution. Microsoft is also one of the most expensive platforms available, and not everyone, particularly students, can afford it. As a result, we concentrated on creating a free, user-friendly interface.

We keen to interact between users and members of the same team through individual and group internal chats, which sets us apart from the rest of the applications and programs.

# 4

## Methodology

As previously mentioned, React Native and React were utilized for the GUI, thus we began by setting up the environment before starting the implementation including the installation of the required dependencies such as jdk, android studio, visual studio code editor, node taking care of the suitable versions. After that, installing Firebase SDK and setting the its configurations in-order to use it. Base64 algorithm from an installed package used for the process of encrypting the password before being saved to the database to be more secured.

Customized font families used for the text design **Saira Semi Condensed**, and **Arima Madurai**. The **Font Awesome** package used for Icons. In addition to **DateTimePickerModal** to pick the deadline of projects, date period of tasks, and meetings dates. For high quality and attractive design **LottieView** [7] used in the first pages. Sending emails via Node.js using **Nodemailer** [8] for password modifying.

To provide flex transition between the pages, a stack navigator is used. In addition to the tab navigator to move between the internal screens of the app.

## 4.1 Implementation

### 4.1.1 Application

First, as a user in the application need to have an account following the next flowchart in figure 4.1. If the user already have an account, then he can login directly but if forgot the password then can change it. On the other hand, if it is the first time using this app then require to register providing some personal and academical information then go to the login screen again.

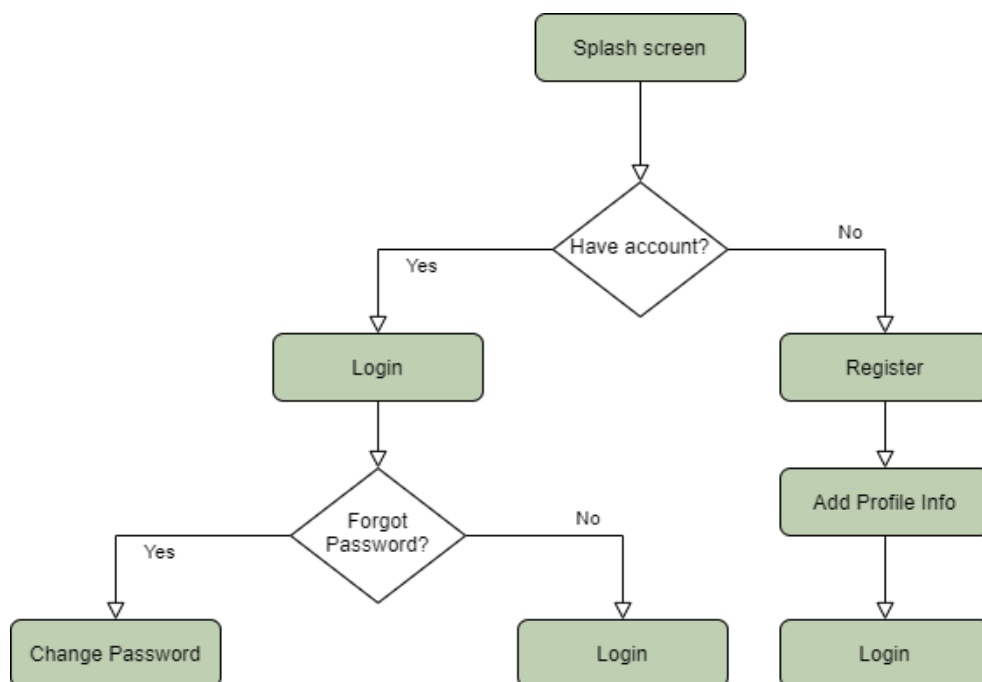


Figure 4.1: Login, Register flowchart

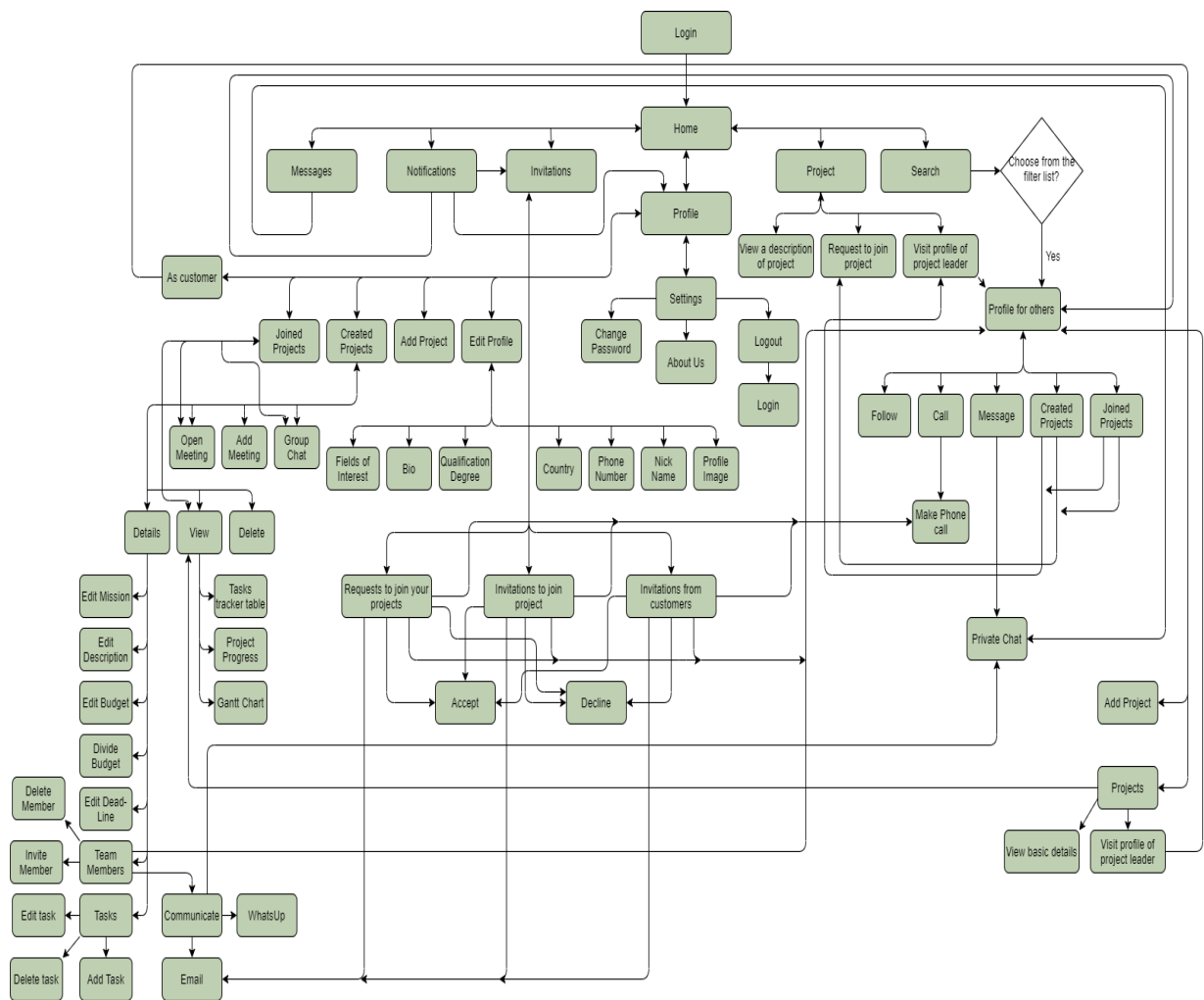


Figure 4.2: User flowchart

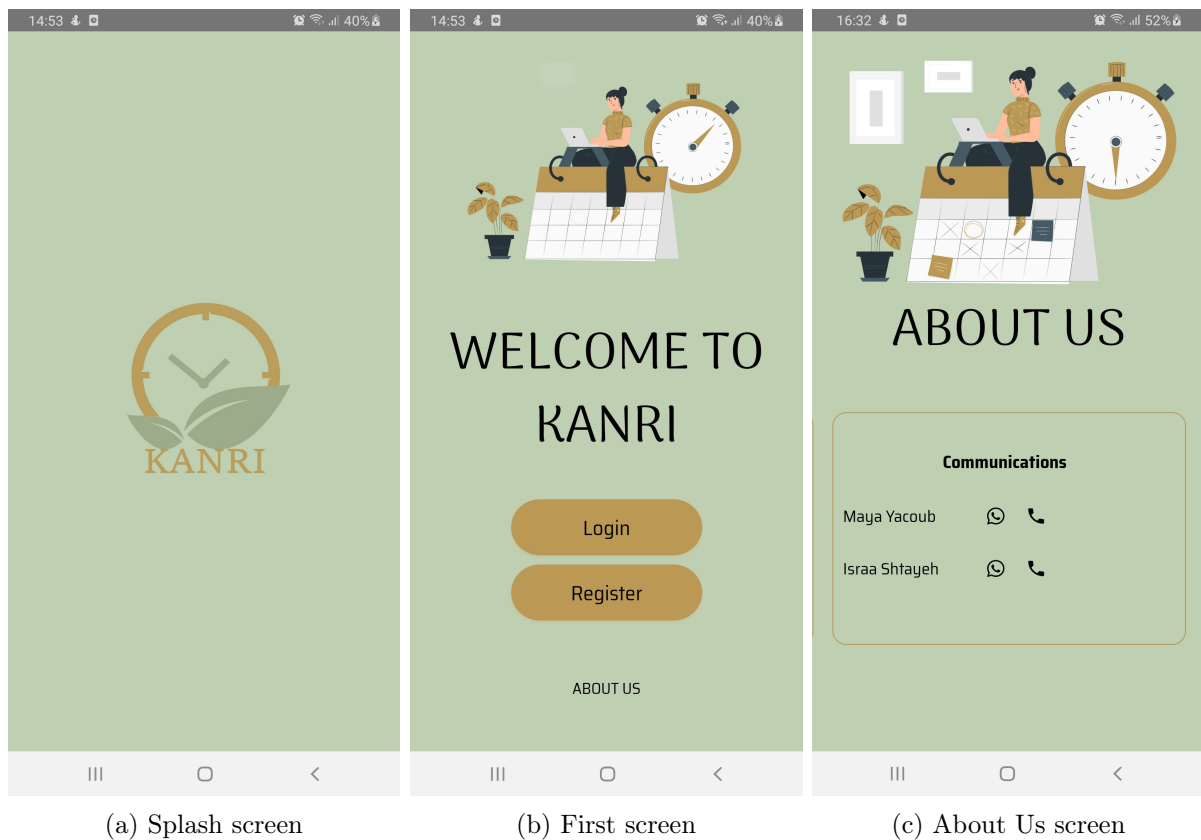


Figure 4.3: Splash, First screen, and About us

Figure 4.3 show the splash and the first screens. In the first screen if the user already have an account can Login, if not Register. To figure out the information about the application and the developers then click on **About Us** label. After that About Us screen will be opened as 4.3c with horizontal scrolling to reach all details. Also be able to contact the developers by phone number using **WhatsUp** interface or calling.

The figure shows two sequential screenshots of a mobile registration form. Both screens have a light green background and a header illustration of a person sitting at a desk with a laptop, a large stopwatch, and a calendar. The status bar at the top of both screens shows the time as 14:53, a signal strength indicator, a Wi-Fi icon, and a battery level of 40%.

Screen (a) displays the following fields:

- First Name:
- Last Name:
- Gender:
- Birth Date:
- Country:

Screen (b) displays the following fields:

- Country:
- Phone:
- Email:
- Password:
- Confirm:

Both screens feature a prominent orange  button at the bottom center. The bottom navigation bar of both screens contains three icons: a hamburger menu, a home circle, and a back arrow.

(a) Register screen 1

(b) Register screen 2

Figure 4.4: Register, first step

In the **Register** section 4.4, the user need to fill all the fields in this screen first. The most crucial information are the email address and phone number. If the **Register** button pressed then the data will be stored in the mongodb, taking care of storing the encrypted value of the password, then will go to the next step to fill the profile information as what will be described next.

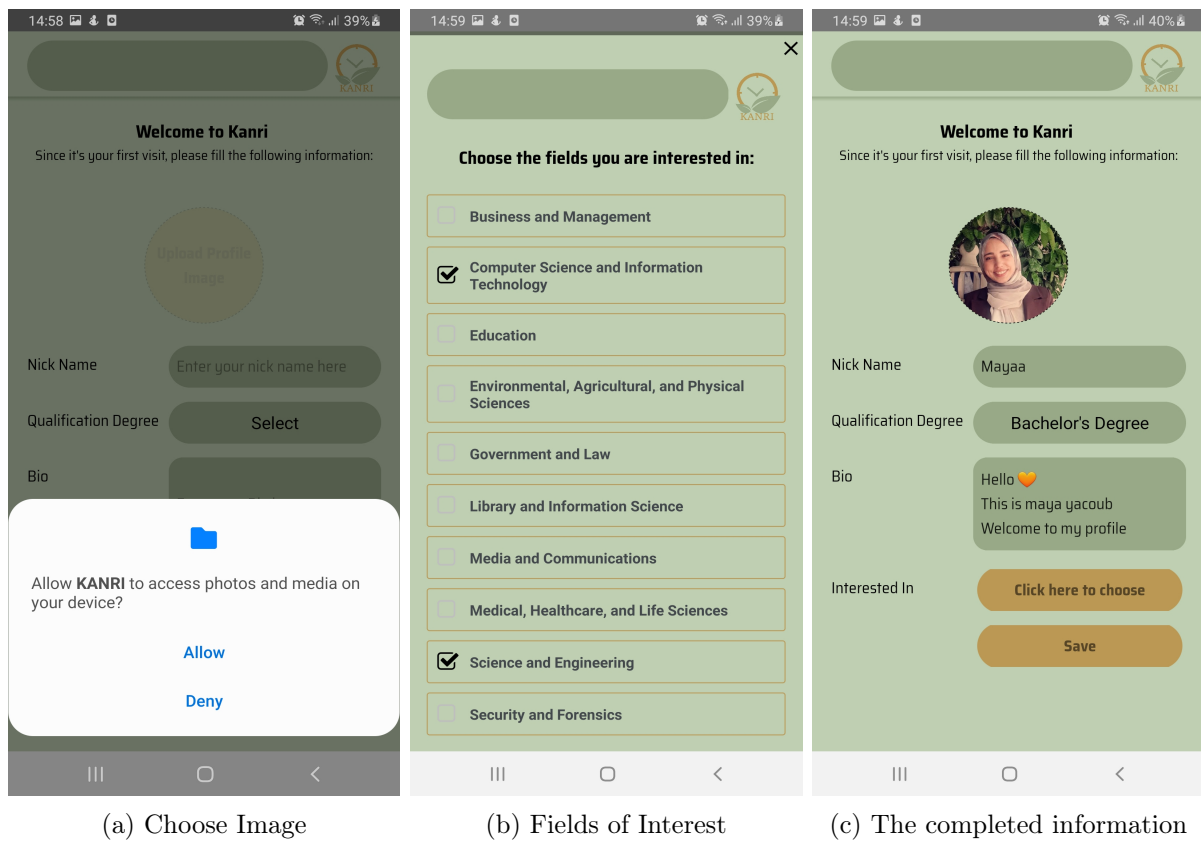


Figure 4.5: Register, second step

As said before, in the next step to register is provide the profile info, then choose the fields of interest which plays an essential role in the application 4.5b. Figure 4.5c shows all fields.

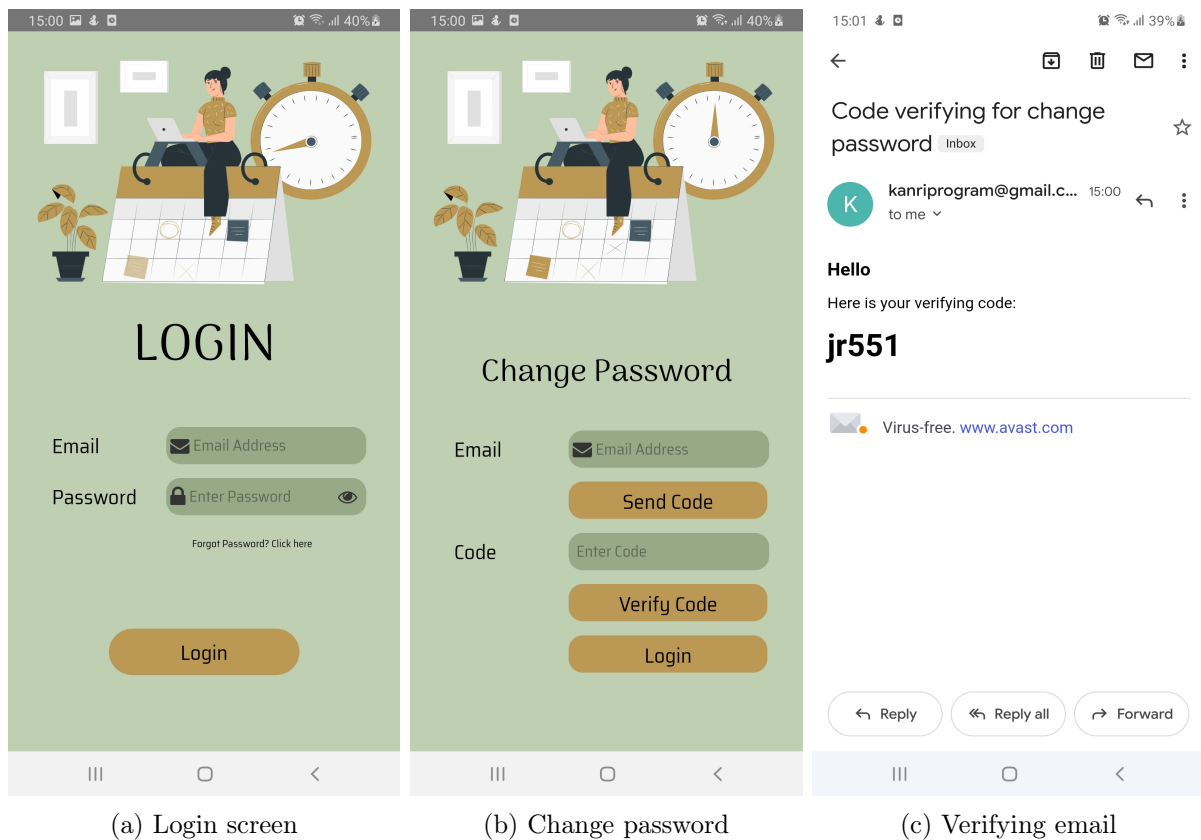
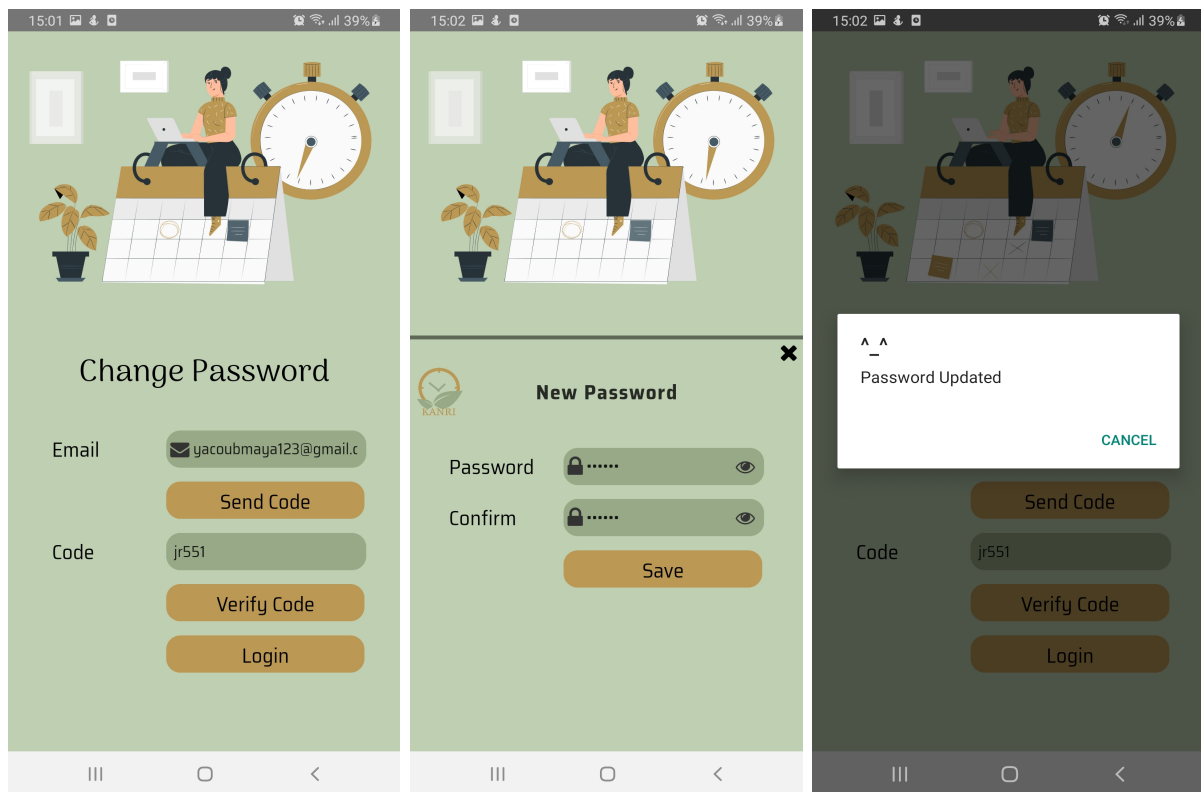


Figure 4.6: Change Password

If the user is successfully logged in, the email will be saved in **AsyncStorage** so that the user can be remembered. But if the user forgot the password then can go to change password screen. After entering the email and request for the code, an email will be sent to the applied one with the verifying code.



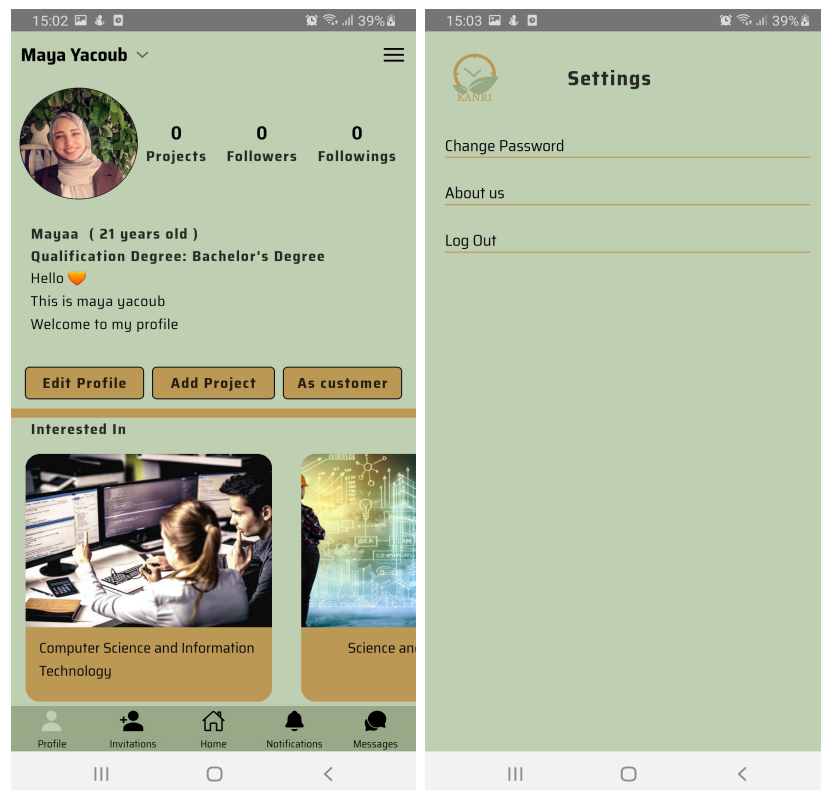
(a) Code

(b) Change password

(c) Password Changed

Figure 4.7: Verify code

When the user enter the correct code then he will have the ability to change the password. The user now can login with the new one. The Home tab will be shown.

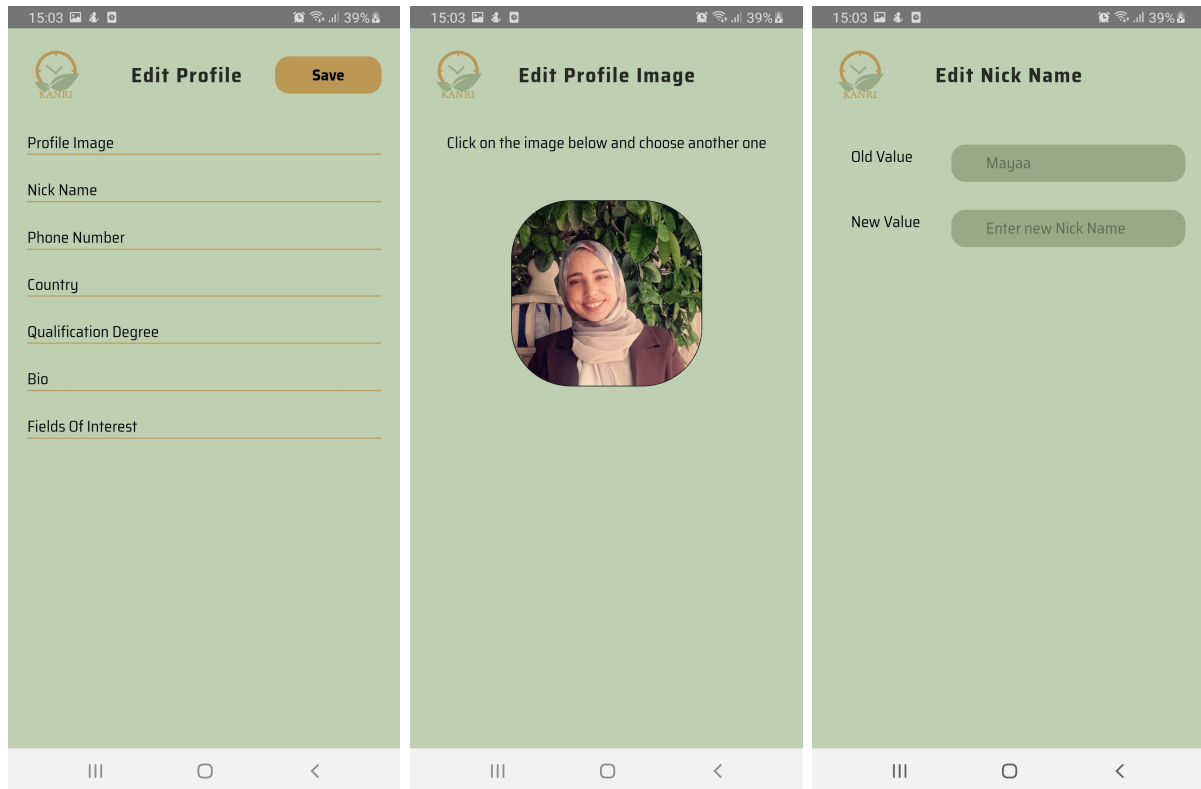


(a) Profile page

(b) Settings

Figure 4.8: Profile &amp; Settings

The Profile tab **profile** show some of the user information in addition to number of projects created, number of followers, and number of followings. If the menu icon on the most top-right pressed then the settings screen will display where the user can change the password, display the About Us screen or logout from the application with cleaning the AsyncStorage so the user will not be remembered until logging in again.



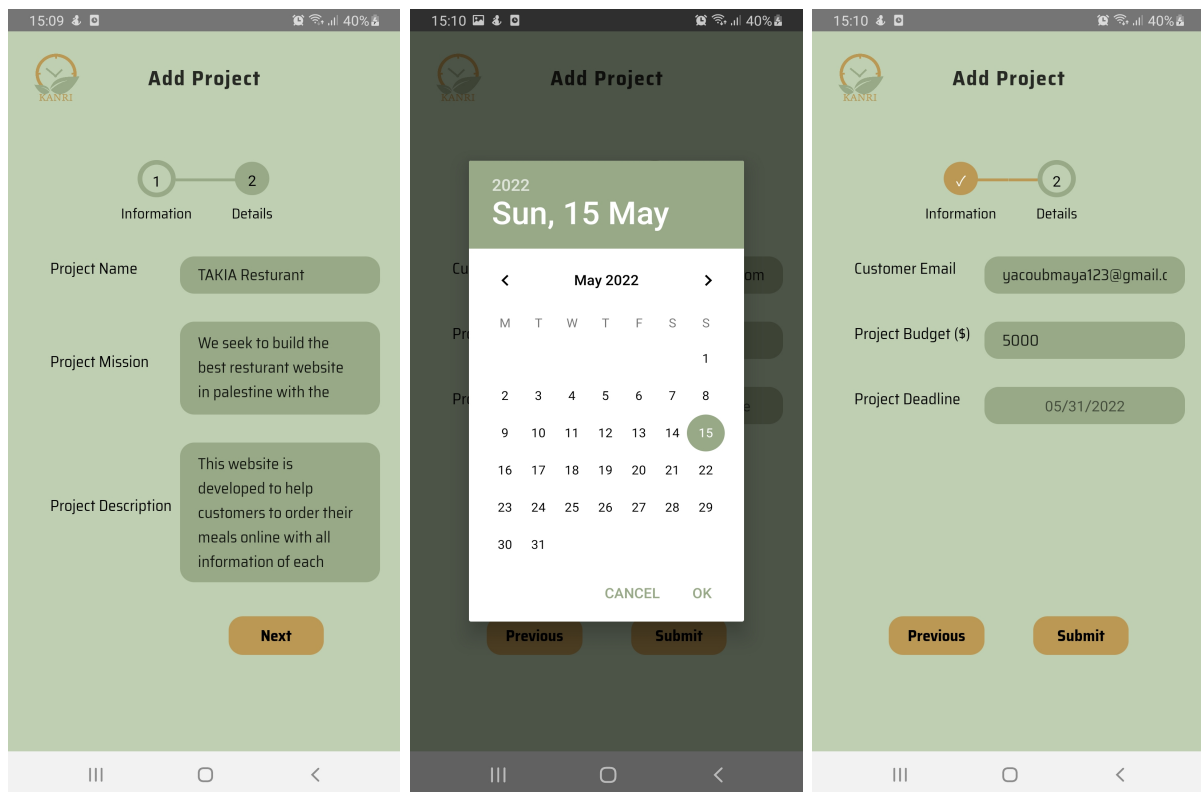
(a) Edit Profile List

(b) Edit Image

(c) Edit nick name

Figure 4.9: Edit Profile

For editing any of the personal details, the user can click the button **Edit Profile** in order to display the editing screen as in 4.9a. And now can edit anything like profile image 4.9b, the username 4.9c, or something else from the provided list.



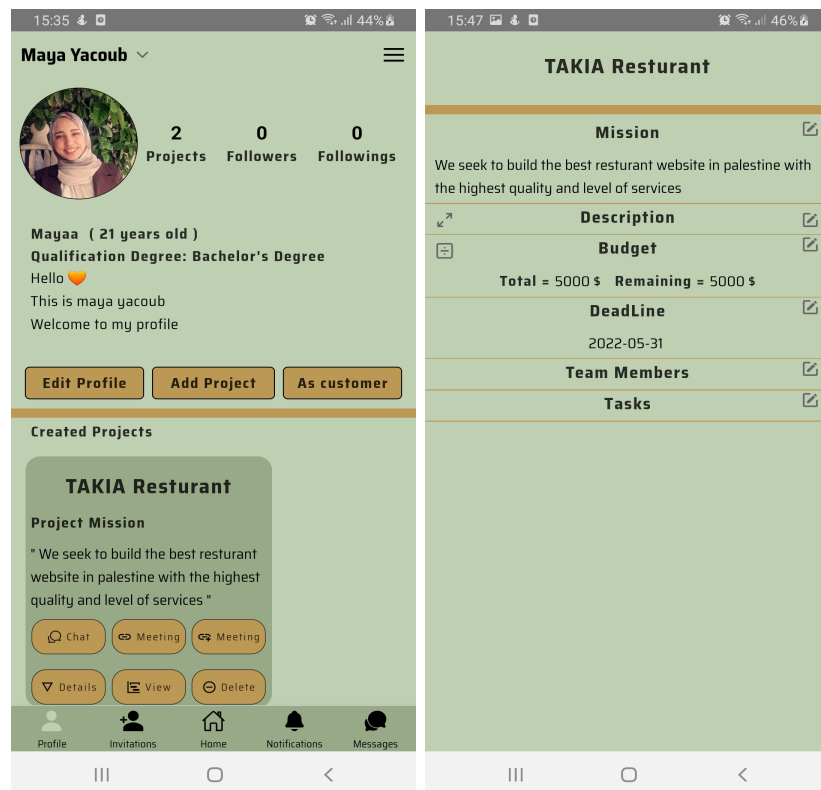
(a) Information step

(b) Dead Line

(c) Details step

Figure 4.10: Add Project

Any user can create his own projects being the leader if he pressed the **Add Project** button then a screen as 4.10a will appear. In the first step will provide the descriptive information. In the following step will apply details such as the customer email if it is for someone else, but if it is for him then apply his own email. After that entering the dead line of the project using the DateTimePicker modal 4.10b in addition to the budget.



(a) Profile page

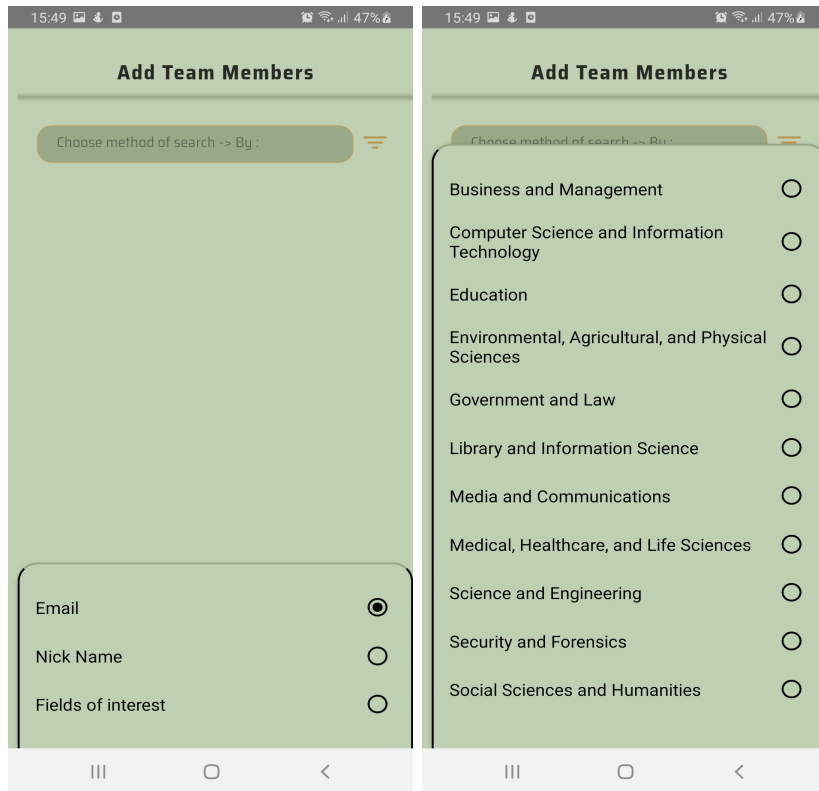
(b) Project Details

Figure 4.11: Created Projects &amp; Project details

The created projects will appear in its section as shown in 4.11a. In order to delete the project press **Delete**. For the **Details** button, it will show the details of the chosen project as in 4.11b. Each section features a part, each part can be edited.

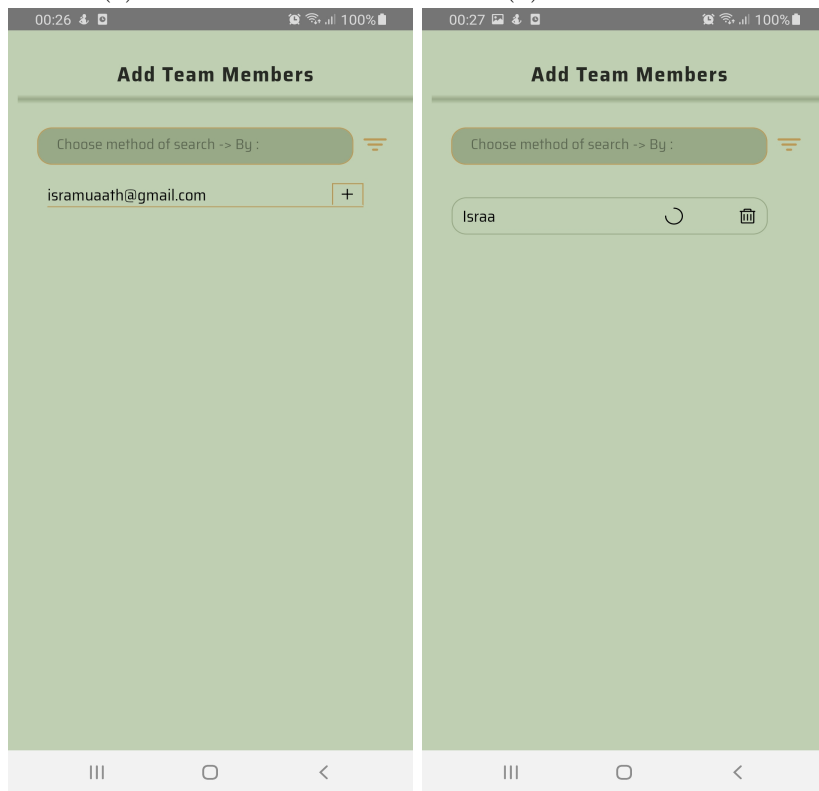
When the edit icon in the **Team Members** section is clicked, the screen in 4.12a appears, allowing you to select the method of search and filter the people accordingly. If the username or email is selected, the user will be able to begin typing in the search area. If the fields of interest are selected, a list of fields will be displayed from which to choose. A list of users will appear based on the option selected.

Press the plus icon beside any user in the list to send him an invitation to join this project, then wait for the user to accept. Or delete the invitation by pressing the deletion icon. Only if the targeted user agrees, the loading icon will change to a check icon, and he will be assigned a task by the leader.



(a) Search Method

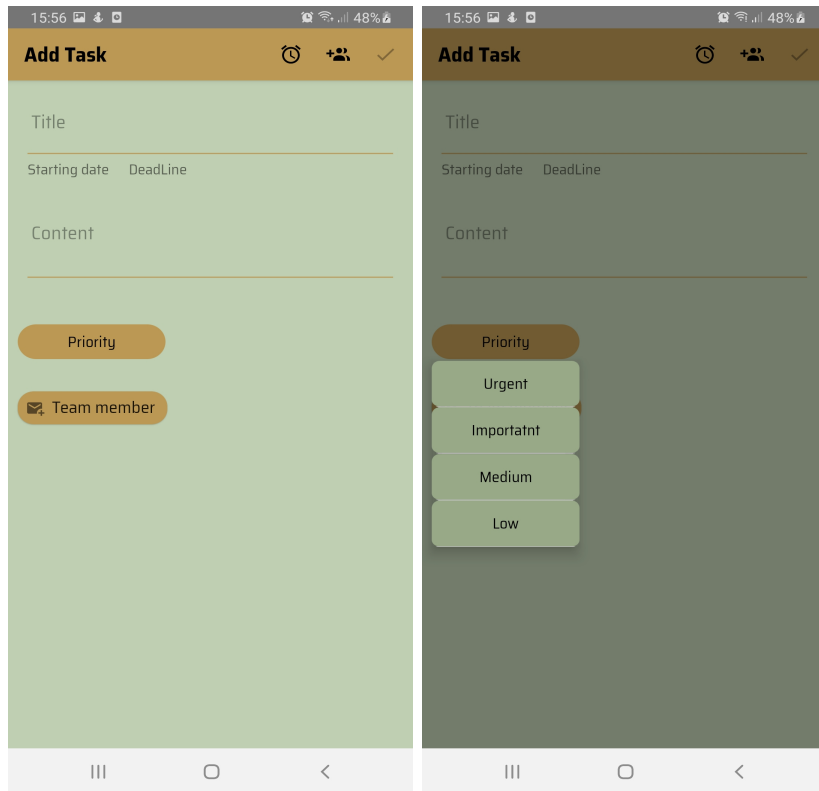
(b) Fields of interest



(c) List of users

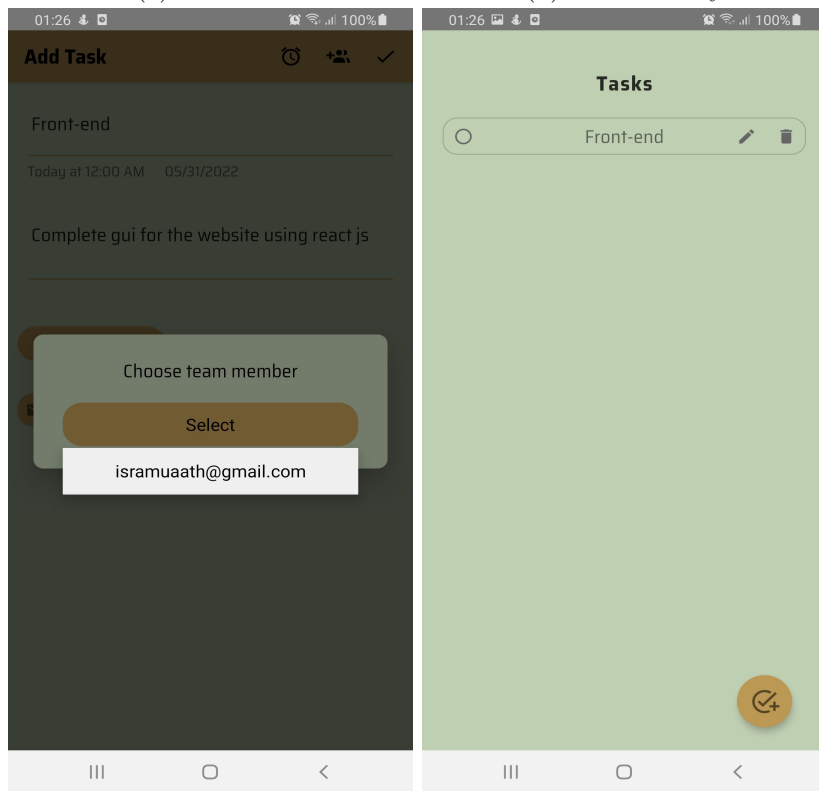
(d) Chosen user

Figure 4.12: Add members to Project



(a) Add task

(b) Task Priority

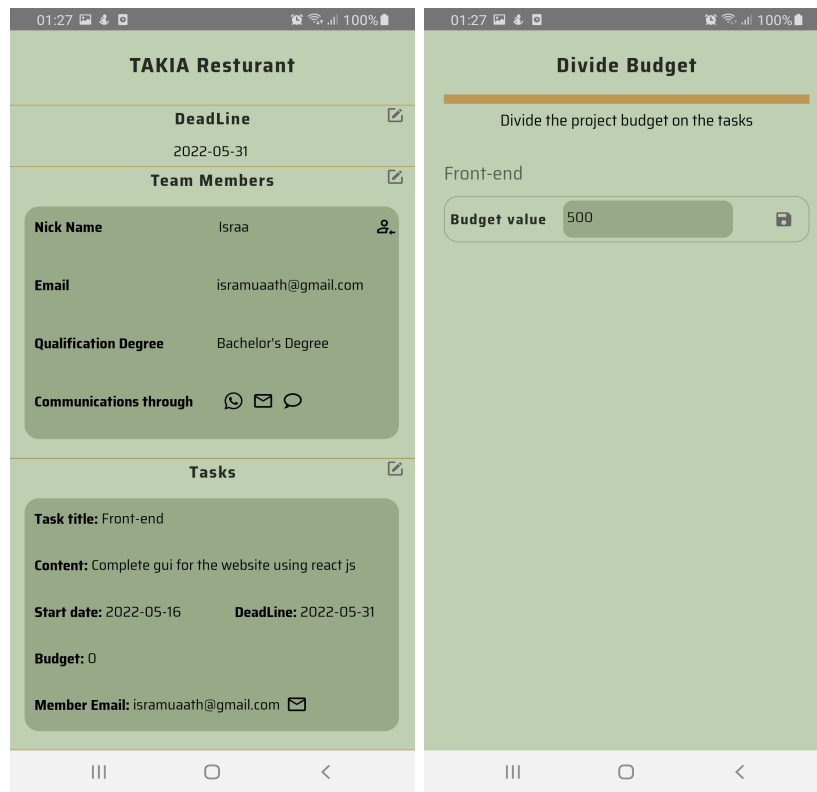


(c) Task Member

(d) Added task

Figure 4.13: Add task to Project

In order to add a new task in the project, click on the edit icon in the project details, tasks section then add task after that 4.13d will be displayed. Addressing the title, period, and a brief description in the content field, in addition to the priority of the task as in 4.13b. Then decide which member will be in charge of this assignment. The work will be assigned to that member and he will be alerted when the task saved. Figure 4.13d depicts the added tasks, along with some icons controlled by the leader. He has the ability to alter, approve, or delete the task. Any changes will be notified to the member.



(a) Added Members &amp; Tasks

(b) Divide Budget

Figure 4.14: Added members &amp; tasks

The communication options via WhatsUp interface, email, or the internal chat will be provided in a horizontal list for newly joined team members 4.14a and the added tasks appears in the next horizontal list. The leader can split the budget among the tasks as in 4.14b.

When the **View** button for the project in the profile is pressed, figure 4.15a appears, which shows all of the tasks with a gantt chart to depict the project timetable. A description of any task on the chart will emerge when you click it, as seen in 4.15b. The group chat in 4.15c was created with mongodb rather than live chat which will be accessed by the **Chat** button.

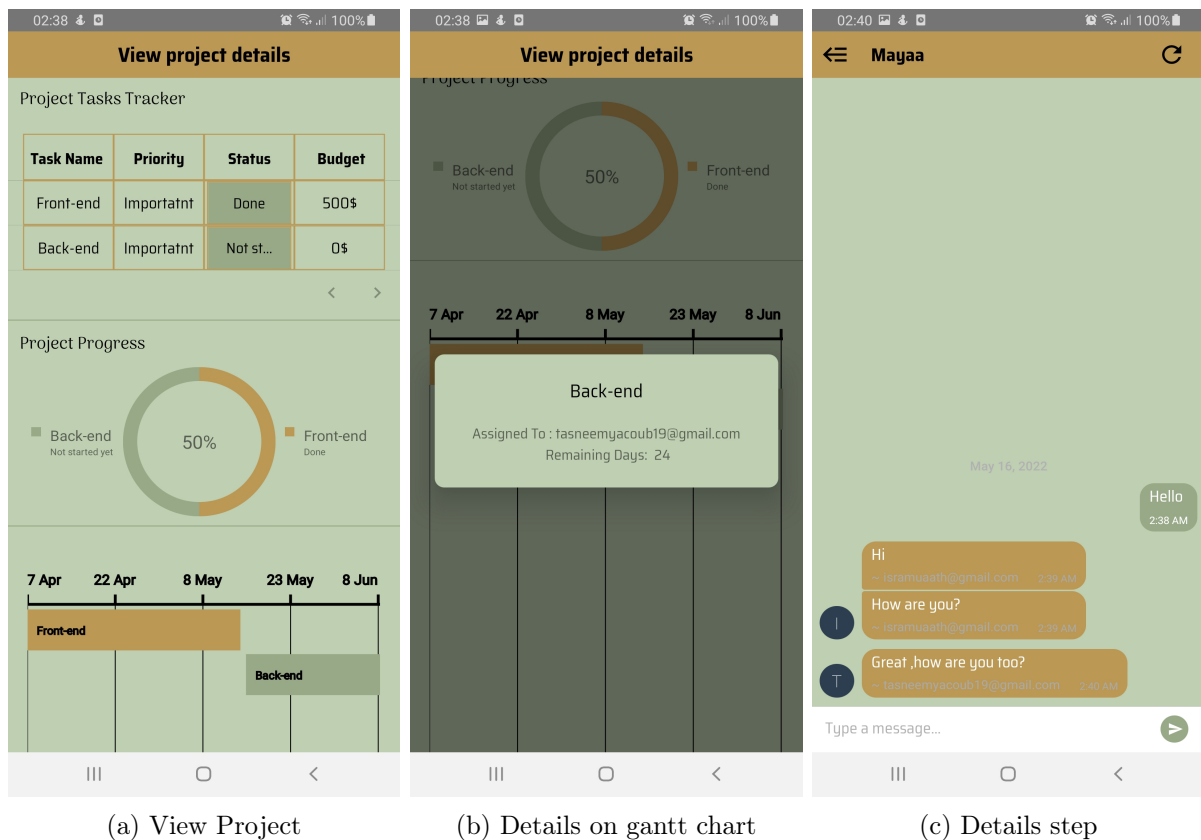
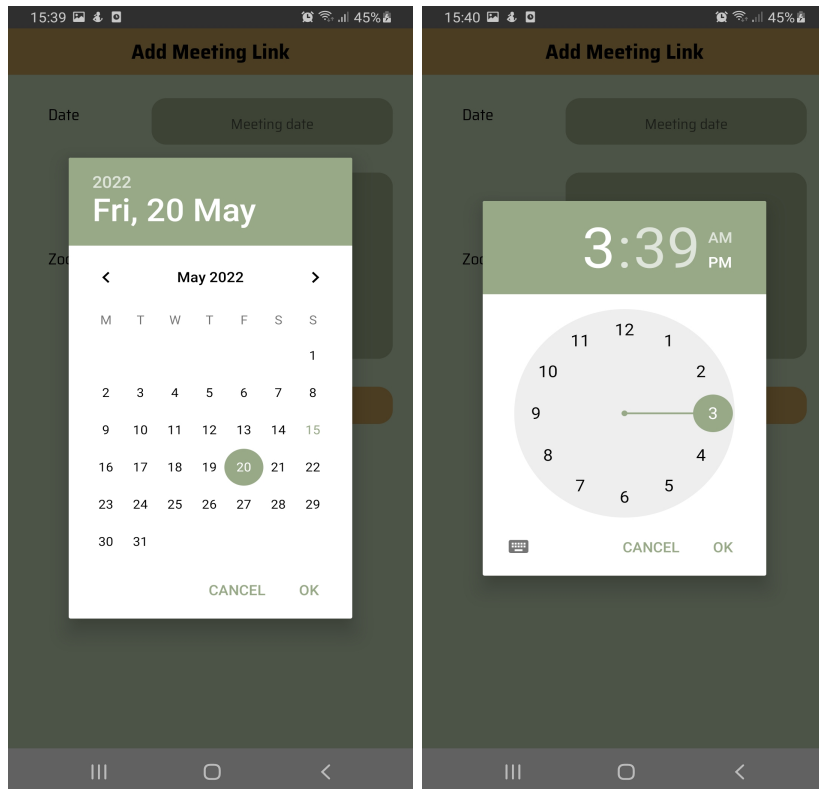


Figure 4.15: View & Group chat of project

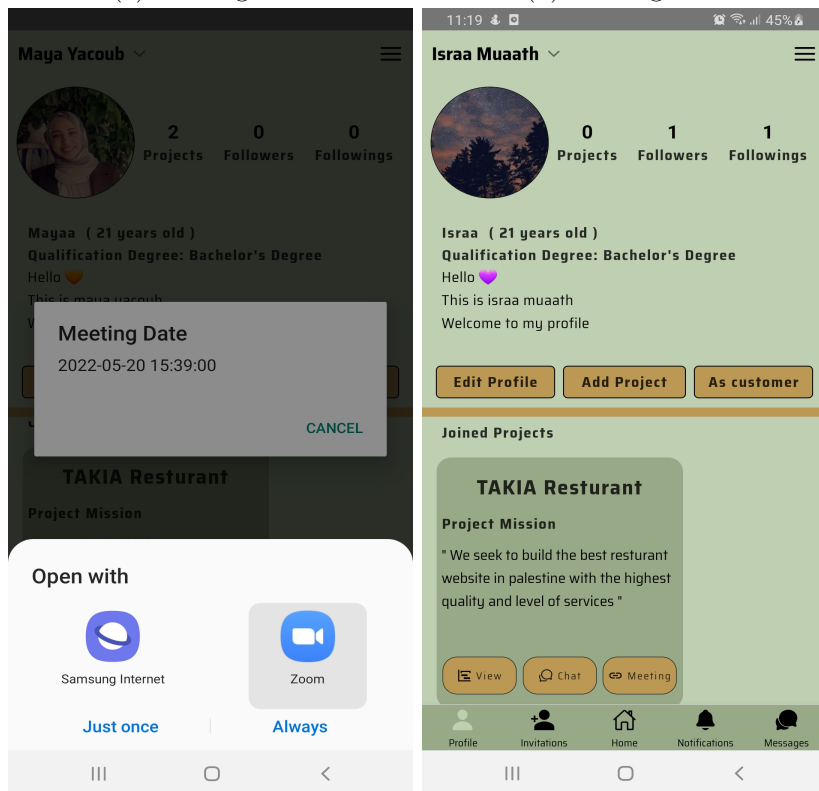
The **Meeting** + button adds a new meeting link , with the goal of creating a zoom meeting and using its link in the project which can be entered via the **Meeting** button 4.16c with the details of date 4.16a & time 4.16b. And Simply press the Delete button to delete the project.

For the joined projects 4.16d, the user can show the view of the project 4.15a and can update the status of his tasks only. He has access to the group chat 4.15c as well as the opportunity to attend the leader's meeting 4.16c.



(a) Meeting date

(b) Meeting time



(c) Details step

(d) Joined Projects

Figure 4.16: Project Meetings details & Joined Projects

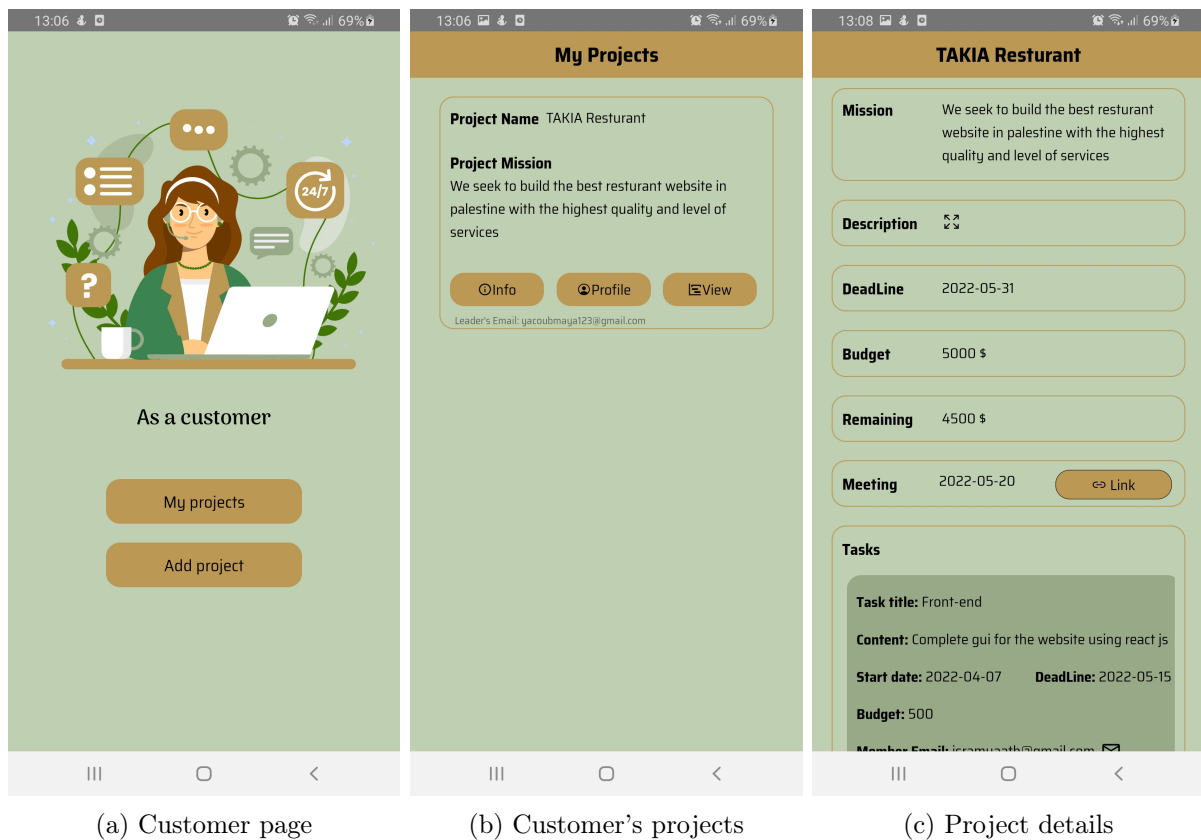
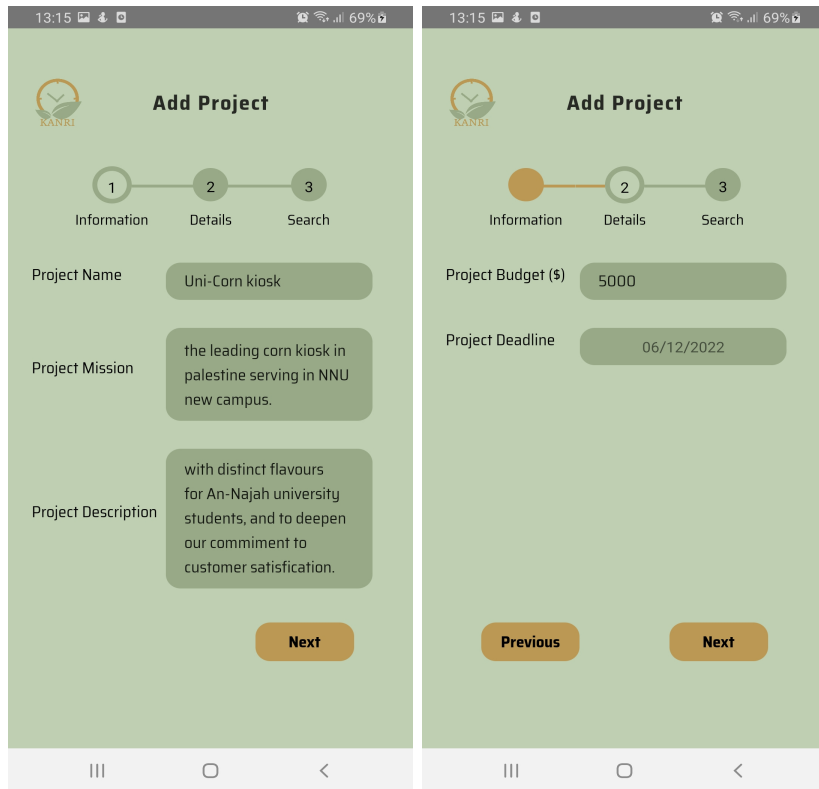


Figure 4.17: User as customer

The user could be a customer looking for someone to help him with a project in a particular field. He can display his projects as well as add a new one 4.17a.

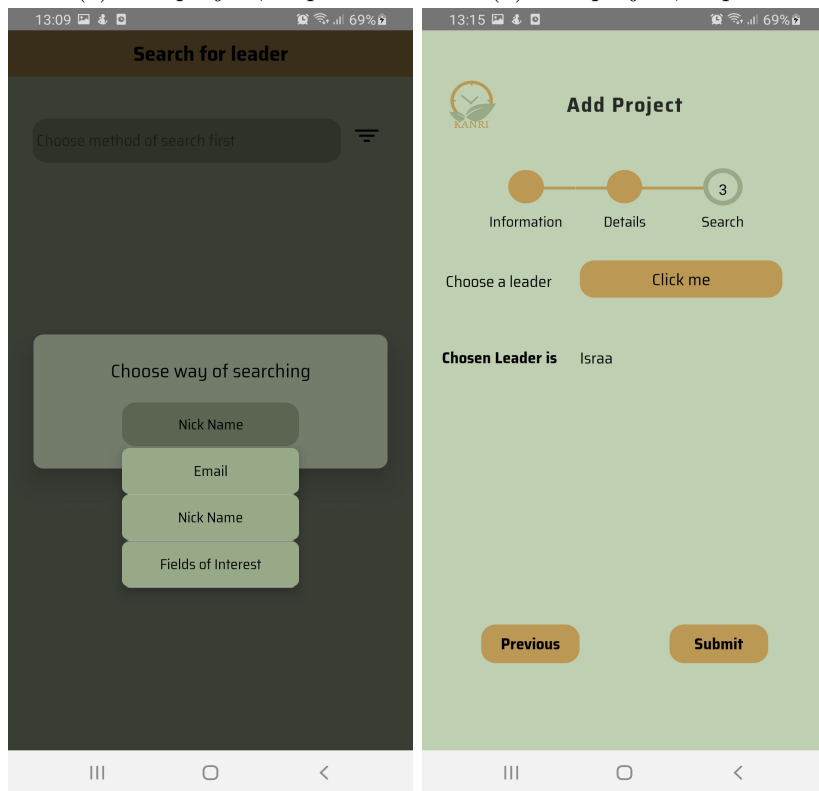
In order to show the information in 4.17c press **Info** button for the project. To visit the profile of the leader **Profile**. And **View** display the tasks details as in 4.15a.

To add a new project, the customer must fill out all of the information in 4.18. And, depending on the search strategy, the leader can be chosen.



(a) Add project, step 1

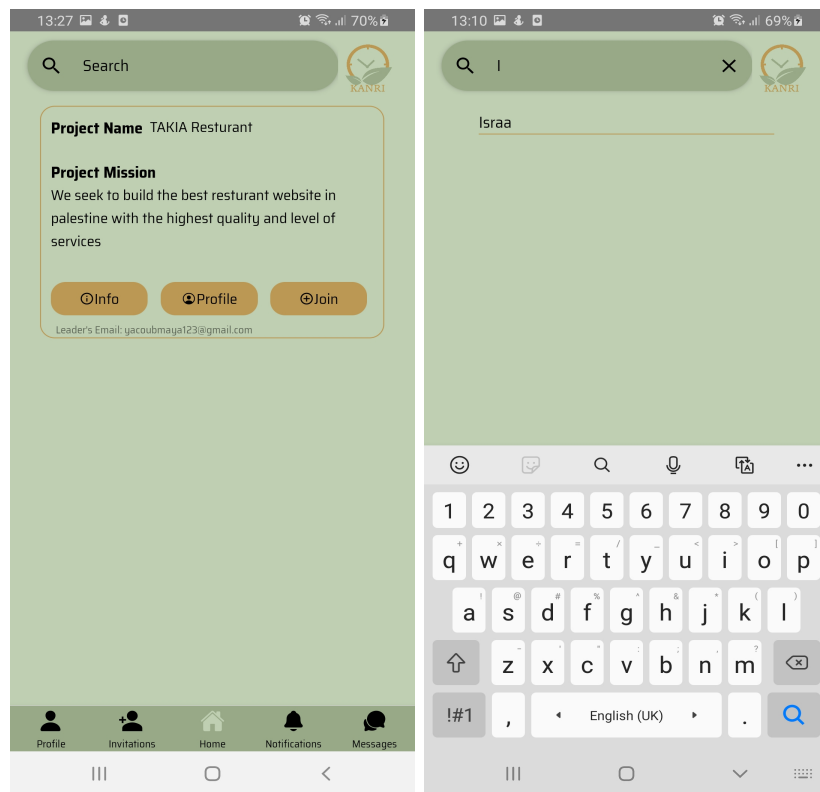
(b) Add project, step 2



(c) Choose leader

(d) Add project, step 3

Figure 4.18: Add a new project from customer

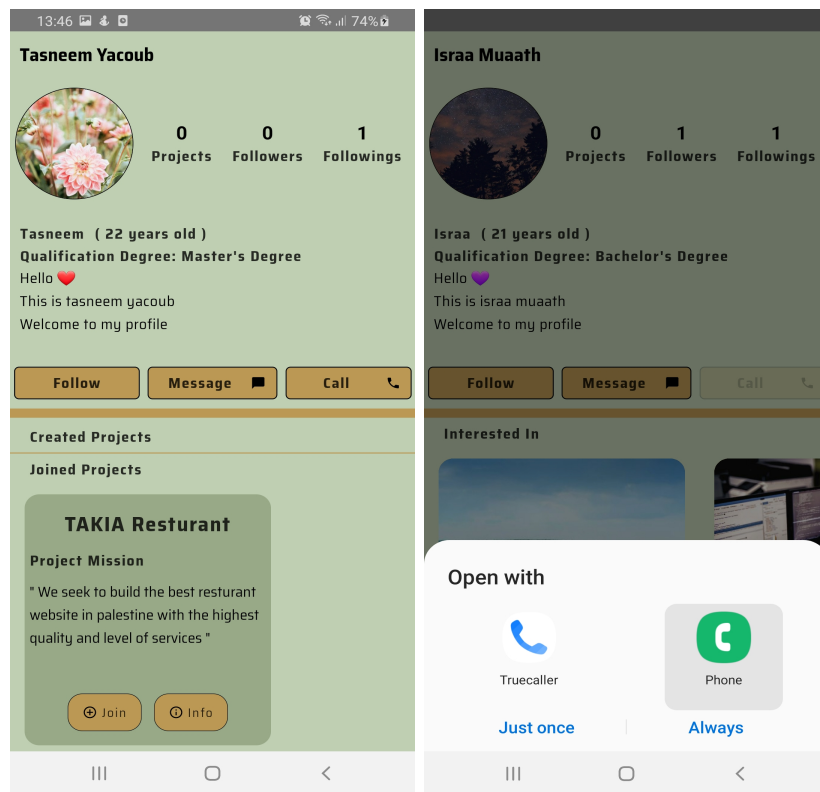


(a) Home screen

(b) Search

Figure 4.19: Home screen &amp; Search property

All users' projects will be presented on the Home screen, allowing any user to request to join any of the newly established projects 4.19a. The User can search for others profiles by entering their user name and then selecting one from the filtered results 4.19b.

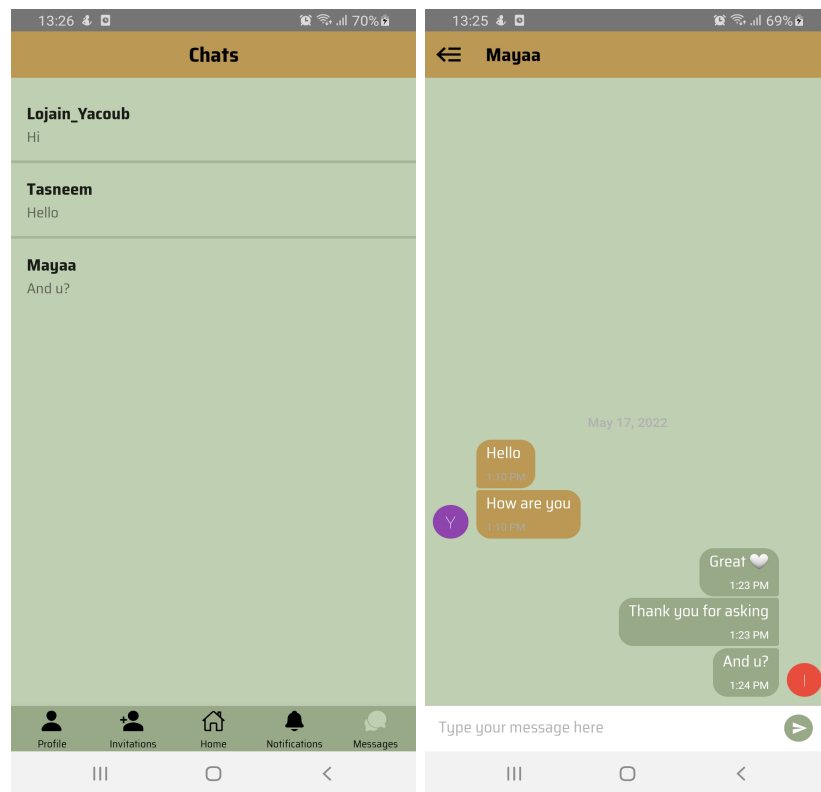


(a) Profile for others

(b) Call property

Figure 4.20: Profile for others

In visited profile, user can follow/unfollow, chatting, and make phone call. For the created and joined projects, the user can request to join in return, a notification will be sent to the leader for rejection or acceptance.

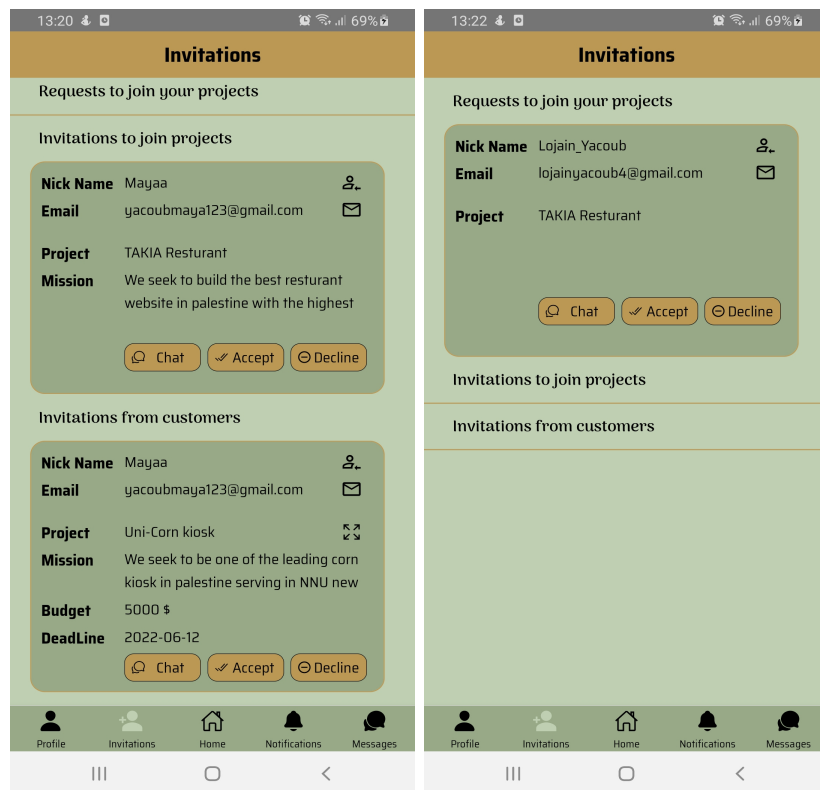


(a) Chats list

(b) Private chat

Figure 4.21: Messages screen

Live chat was implemented using **Firestore** as in 4.21. Any user will be able to hold a private conversation with anyone else.



(a) Requests

(b) Invitations

Figure 4.22: Invitations screen

The **Invitations screen** contains a variety of requests or invitations that can be accepted or denied by the user. Accepting the request instantly adds the sender to the team; accepting the invitation to join adds the receiver to the team, and accepting a customer's invitation creates the project and adds it to the user-created projects.

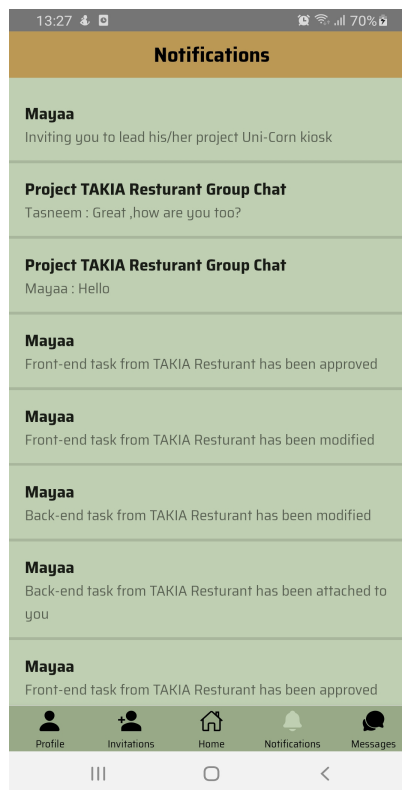


Figure 4.23: Notifications screen

When any activity between users occurs, specifically between followers and team members in a project, the **Notifications** screen will display all these types of notifications.

## 4.1.2 Website

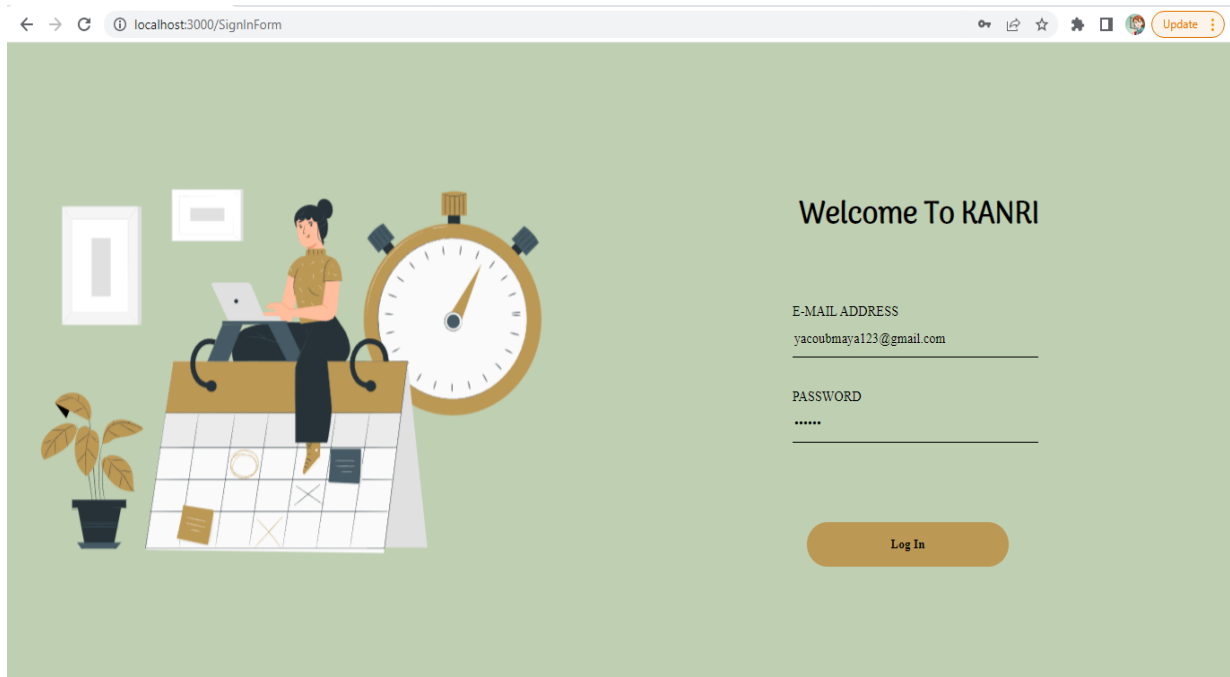


Figure 4.24: User login page

For the website, focused on the view of the projects and the its analysis. If the users already have an account, they can log in using their email address and password.

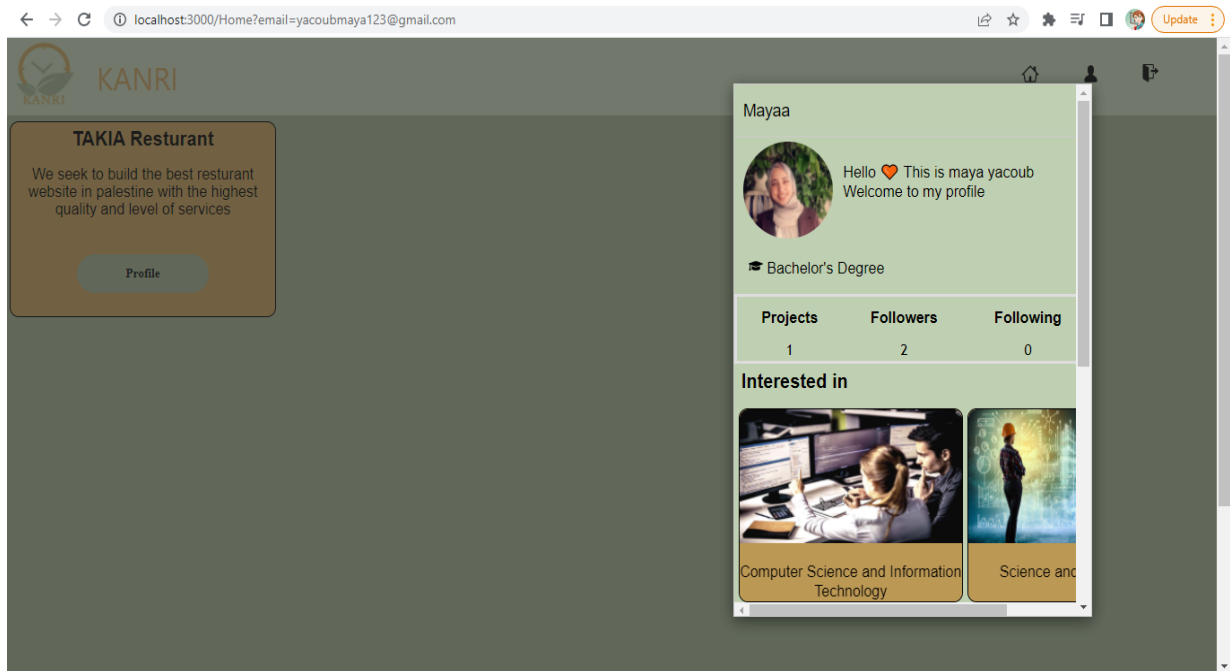


Figure 4.25: User Home page

All user's created projects are listed on the home page, the project leader's profile (accessed via the profile button in the project cards), as well as the user profile (accessed via the person icon) which contain created and joined projects. The user can also go to the project's view page (accessed via view button).

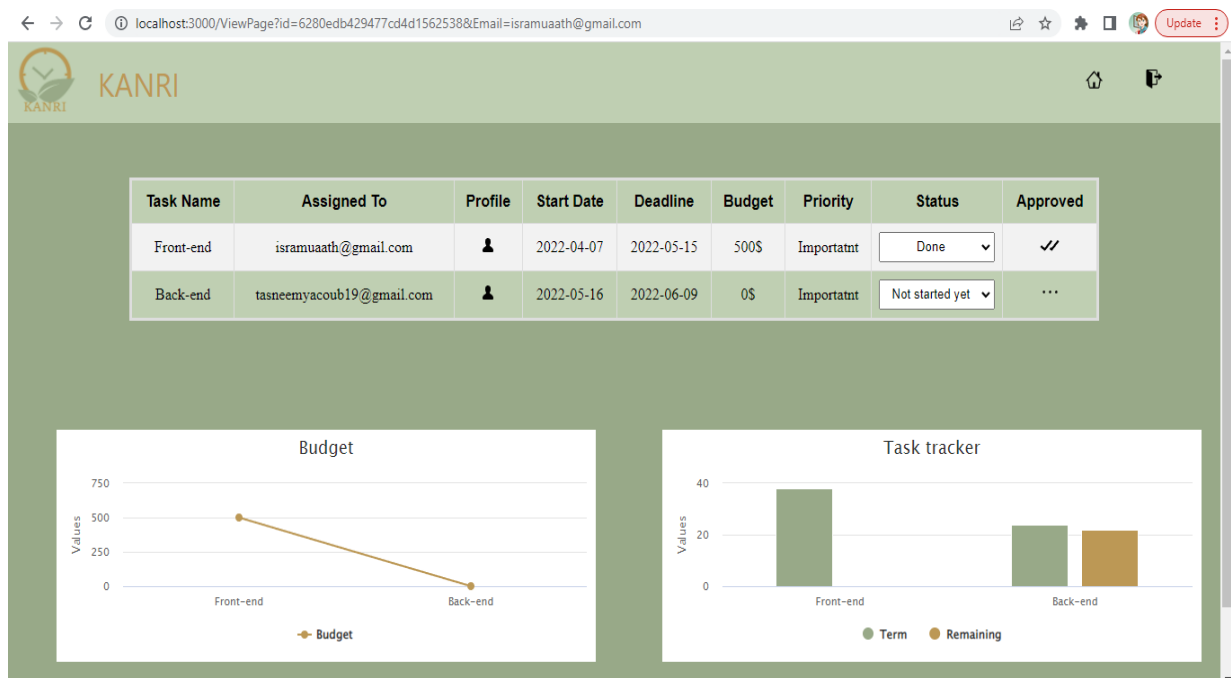


Figure 4.26: Project View page

The view page shows how the project's tasks are distributed among the members, as well as the status of each task the user can only update the status of his task if he has one. There are also graphs showing the cost distribution across tasks as well as, number of days left until the deadline, as a visual representation technique.

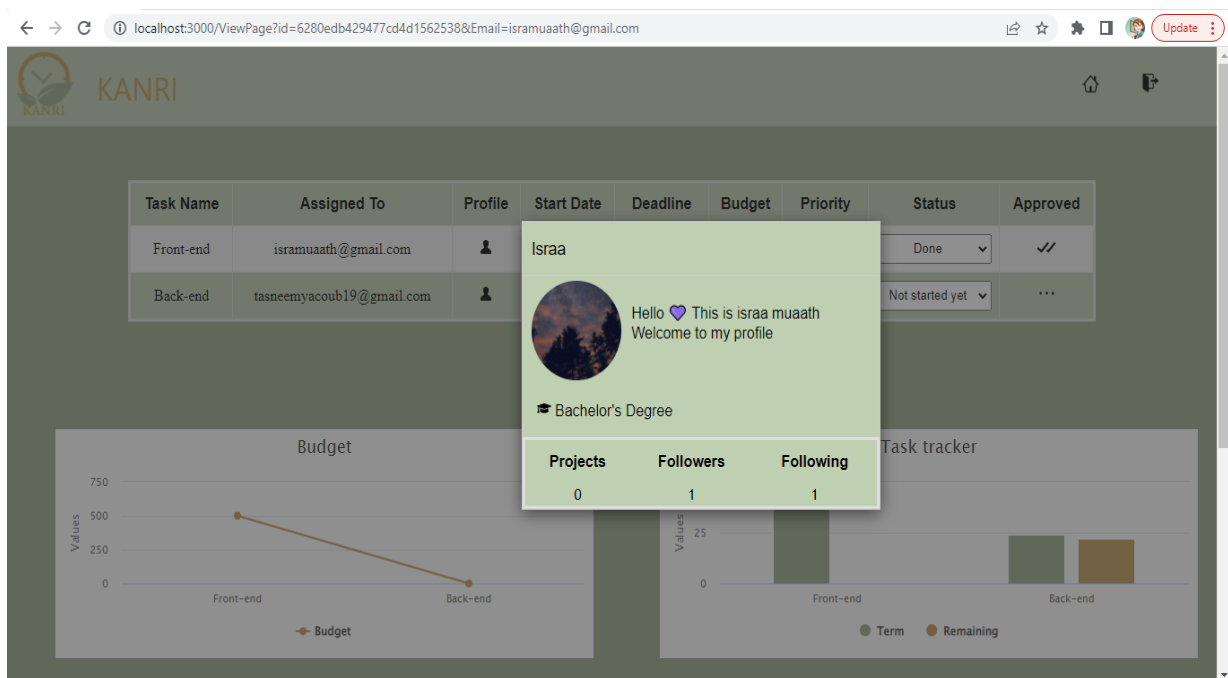


Figure 4.27: Team member profile

When the team member profile icon is pressed, then small dialog with his profile will be shown.

4.1.3 Admin

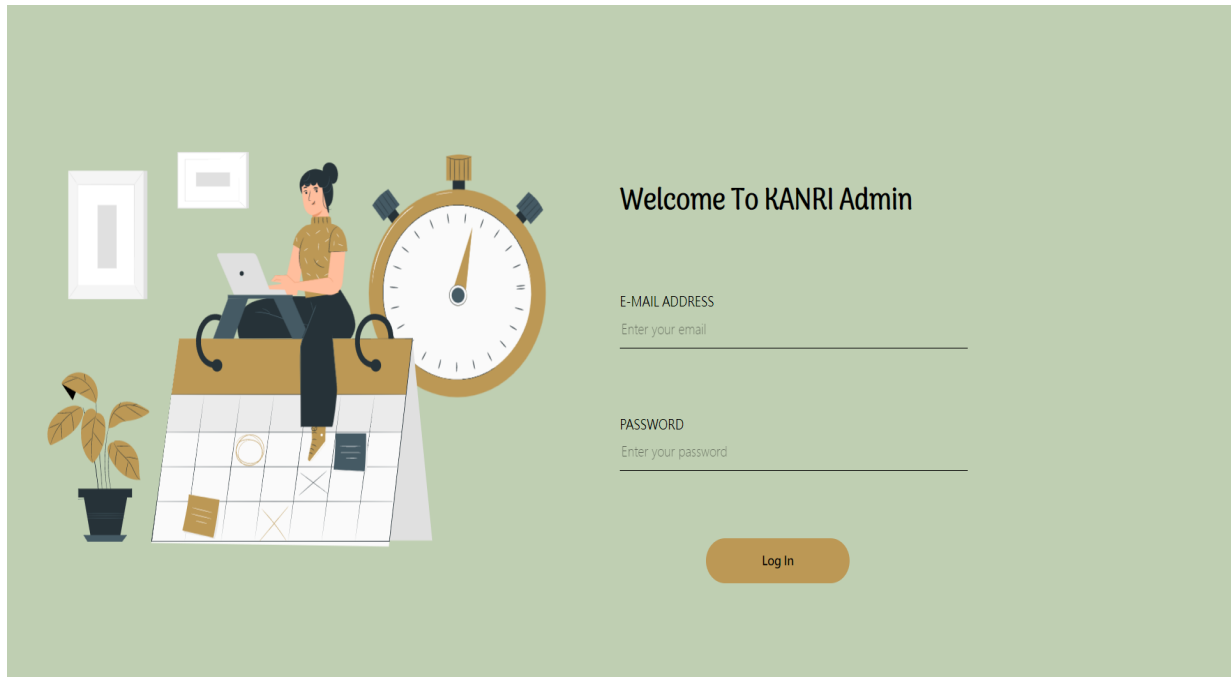


Figure 4.28: Admin login page



The screenshot shows the Admin Home page with the KANRI logo in the top left and a user icon in the top right. A table displays user information with columns for Full Name, Gender, Country, Phone Number, Email, Followers, Followings, Projects, and Show Projects. Each row represents a user, and a plus icon is present in the Show Projects column for each user.

Full Name	Gender	Country	Phone Number	Email	Followers	Followings	Projects	Show Projects
Israa Muaath	Female	Palestine	+972568368397	isramuaath@gmail.com	1	1	0	+
Lojain Yacoub	Female	Palestine	+970598490382	lojainyacoub4@gmail.com	0	0	0	+
Tasneem Yacoub	Female	Palestine	+970598422436	tasneemyacoub19@gmail.com	0	1	0	+
Maya Yacoub	Female	Palestine	+972598490879	yacoubmaya123@gmail.com	2	0	1	+

Figure 4.29: Admin Home page

This is the sole page for the administrator; after logging in, all users will be shown with basic information. If the plus icon in the last column is pressed, a new table will display below it containing some details about the projects that the user has created.



The screenshot displays the KANRI user interface. At the top left is the KANRI logo. The main content area features a table with user profiles and a section for project details.

Full Name	Gender	Country	Phone Number	Email	Followers	Followings	Projects	Show Projects
Israa Muaath	Female	Palestine	+972568368397	isramuaath@gmail.com	1	1	0	⊕
Lojain Yacoub	Female	Palestine	+970598490382	lojainyacoub4@gmail.com	0	0	0	⊕
Tasneem Yacoub	Female	Palestine	+970598422436	tasneemyacoub19@gmail.com	0	1	0	⊕
Maya Yacoub	Female	Palestine	+972598490879	yacoubmaya123@gmail.com	2	0	1	⊕

Below the table, the user profile for Maya is shown:

Name: Mayaa  
Email: yacoubmaya123@gmail.com

Name	Mission	Budget	DeadLine	
TAKIA Restaurant	We seek to build the best restaurant website in palestine with the highest quality and level of services	5000 \$	2022-05-31	🗑️

Figure 4.30: User's Projects

The admin has the ability to delete any project.

# 5

## Results & Discussion

This project is a smartphone application that makes project management and task organization much easier. It's a brilliant framework that allows users to join and establish their own projects, as well as keep track of how effectively tasks are completed. In addition to the possibility to delegate his projects to others. Furthermore, the chatting system is recognized as a useful communication tool that facilitates users and team members to converse more easily.

### 5.1 Project Outcomes

- Mobile and website With the services already mentioned.
- Users can speak privately with one another and with project team members using this chat service.
- Notifications for new invitations, projects, meetings, or any other changes.
- Graphs depicting the task analysis.
- Gantt chart as a tool for visualizing and scheduling project tasks.
- Progress bar to indicate the accomplishment of the project.

# 6

## Conclusion

### 6.1 Benefits & Gains

During the implementation process, we learned many new abilities, such as:

- Using the **React Native** library, **JavaScript**, and **Nodejs** to create an android mobile application.
- How to use **React** and **Nodejs** in order to develop a website.
- Using NoSQL databases: MongoDB and Firebase.
- Using **Firebase** to create an internal live chat service. In addition to a **Mongodb**-based group chat.
- Used our own calculations to determine the project progress, budget distribution and remaining days for each task.
- Using **Draw Io** to create the user flow chart.
- Creating the project report using overleaf.

### 6.2 Recommendations

As part of our future effort, We intend to increase the system quality by adding features such as:

- Providing a functionality that Create a task timeline based on the dependencies between tasks dynamically.
- Providing a tool that generates a report on the status of a work project automatically for the customer.

- Allow multiple people to perform the task that a sub-leader is responsible for.
- Integrate pay pal to enable customer to pay money.

# References

- [1] MongoDB. [Online]. Available: <https://www.mongodb.com/>
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- [3] Npm Packages. [Online]. Available: <https://www.npmjs.com/>
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- [8] Node mailer. [Online]. Available: [https://www.w3schools.com/nodejs/nodejs\\_email.asp](https://www.w3schools.com/nodejs/nodejs_email.asp)