MSc Computer Science

School of Computing, Engineering and Digital technologies

Mobile App Development

Supporting Document for ICA

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Table of Contents

1. Introduction

This is a supporting report for the mobile application development project named "UniClubs". In this report, all aspects of the app are discussed entirely. Firstly, the app working is shown with screenshots. Secondly, all the software design decisions in developing the app are justified, ethical issues are discussed. The project management technique, kanban board usage is shown. Finally, all the digital tools are demonstrated.

This application is specifically designed for the university students. Students can join clubs of their interest, create new clubs, get the messages, and post pictures. This helps students to meet students with similar interests and make friends, which maintains the balance between academics and social life.

2. App Demonstration

UniClubs app contains multiple screens including a splash screen. It also has a login screen. If the user has an account, the user can login by entering the details or register as a new user.
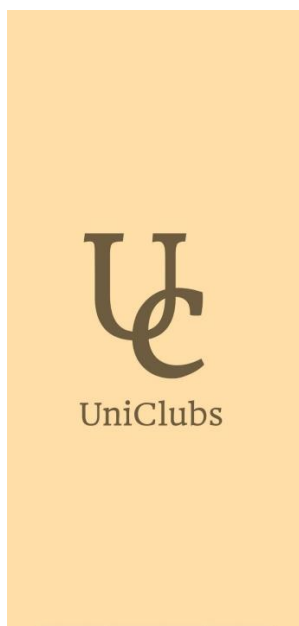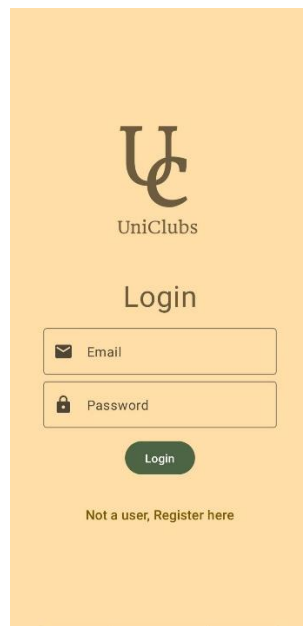

Figure 1: Splash Screen

Figure 2: Login Screen

Figure 3: Register Screen

Once the user logs in, the home page is shown with all clubs. There is a navigation bar to navigate to various pages. The Create club screen is to create new clubs. Another screen is My clubs, where all the joined clubs are displayed.
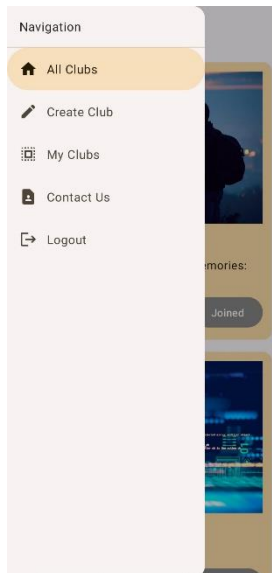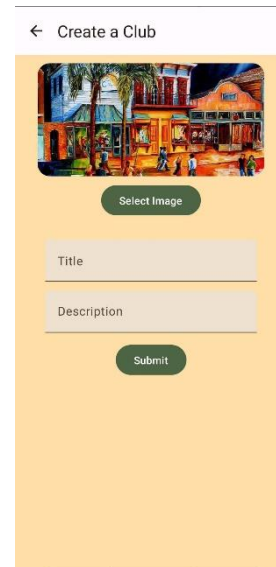

Figure 4: Home Screen

Figure 5: Navigation Bar

Figure 6: Create Club Screen

Furthermore, if the viewer clicks on the clubs, the users can chat. There is a camera screen exclusively for posting pictures.
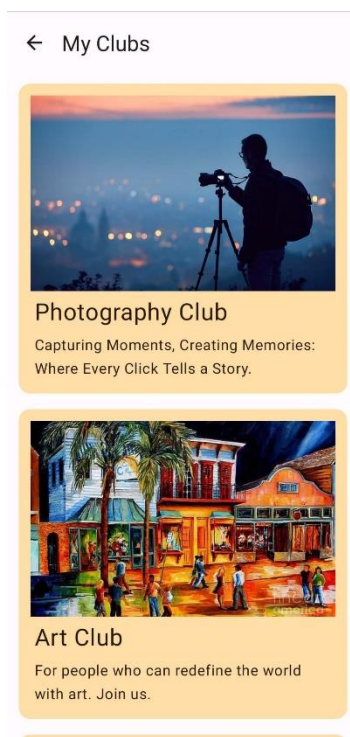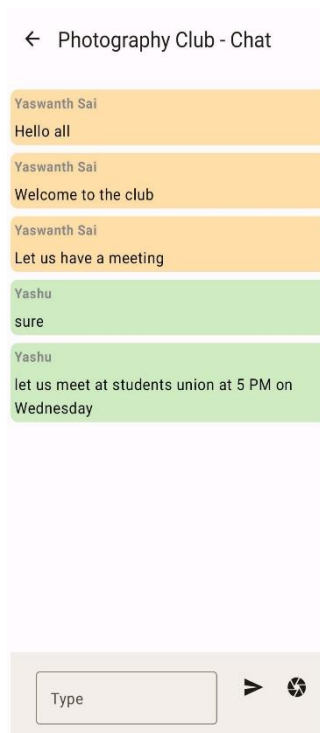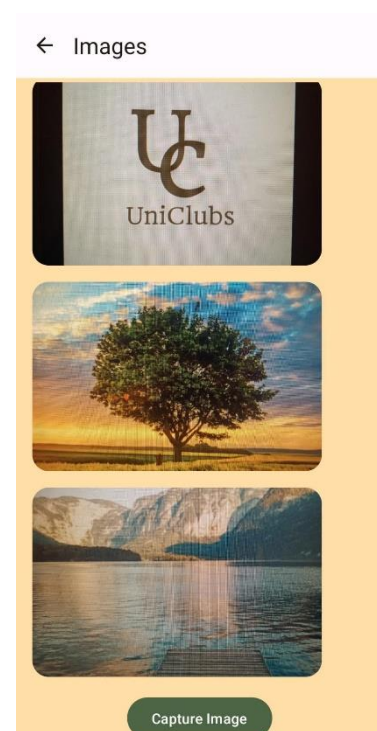

Figure 7: My Clubs

Figure 8: Chat Page

Figure 9: Image Page

3. Software design decisions and Justification

3.1 Design and Layout

UniClubs goal is to provide a neat design and simple navigation for the viewers. Figma is used to design all the wireframes. After that the frontend is completely built using jetpack compose. This avoids the repetition of building pages and linking them to backend.

This app follows industry structured architecture where the data and the logic are handled with view models, which do not involve design. Separate view models are made for logging in, registering, getting user data, creating a club, joining a club, and linking them with the navigation page.
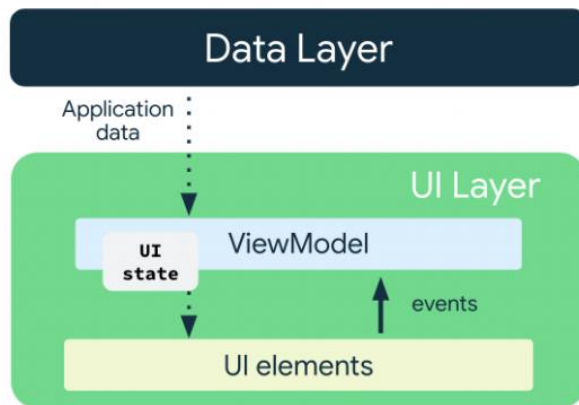
Figure 10: Mobile Architecture

3.2 Hardware Usage

UniClubs app is designed in such a way that it can run seamlessly in all range of devices. To decrease the memory usage like ram and rom, all the images and database are stored in google cloud. This enhances battery consumption, decreases storage and the speed remains the same for all devices as long as they have good internet connection.

3.3 User Experience

The application is built for all types of users. It is simple to use, and all the screens are visually appealing. People majorly use the login screen, all clubs, my clubs, and chat screens, they can be easily navigated by navigation bar.

3.4 Data Persistence

UniClubs uses Firestore for all the data handling and storage. Firestore is a cloud database from Google, which can offer real-time updates and easy integration. Different collections are created namely users, clubs, and images, for storing users' data, clubs' data, and image URLs respectively. This ensures good data persistence for the app.

3.5 Third party Libraries

Firebase authentication is used to manage the logins and registering new users. Firestore is used to store the database regarding the user and club information. Firebase storage is used to store all the images. They are well-established third-party libraries which have good features and security.

4. Social, Legal, Ethical, Security and Professional Issues/Implications

4.1 Legal Issues

The main issue is dealing with data protection laws, especially GDPR regarding the user information. UniClubs has taken this to account and only took the necessary information and used them as required. The member's data is solely used for the app purposes and no third party has access to it.

4.2 Social issues

One of the social issues is to ensure inclusion of all users irrespective of any means. Another issue is to avoid any kind storage related to gender, ethnicity, or religion. This app considered all the issues and hasn't categorized the data based on these factors. On the positive hand, this improves the relationship among all the students.

4.3 Professional Issues

Some of the professional issues are maintaining industry standard coding practices, staying up to date, considering feedback and able to make changes accordingly. As long as this app is being developed, it is made sure that it followed the google style Kotlin practices and updated the app from the feedback of the instructors.

4.4 Security Issues

The security issues maybe data breach, potential leak of user's data to third parties, taking the disadvantage of mobile features as camera and microphone. UniClubs is integrated with Google Firebase which is almost not possible to breach as it is one of the top companies. This app uses camera feature if users allow and does not run on background.

5. Project management

Project management is a process of sequential steps that are required in order to complete a project from the beginning to end. The steps include the project planning, organizing, and carrying out the plan. This also involves the management of different resources like employees, materials, and budget to complete the project's goals.

5.1 Kanban board methodology

Agile is known for its potential to adapt to the changes in a project. Kanban board is a methodology of Agile Project management. Kanban is a Japanese word which means signboard.

Kanban board is visualization tool which helps to track progress effectively by maintaining clarity and transparency in the team. The number of tasks to work will be limited to ensure the tasks are done completely. The project is divided into tasks and can be tracked using to do, in progress and done columns.
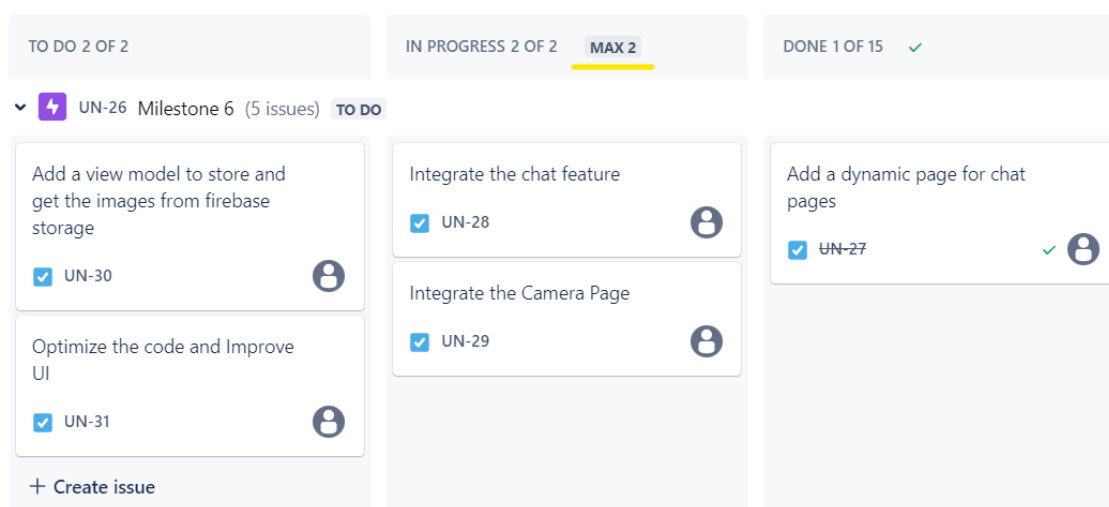

Figure 11: Kanban Board

In the above figure, the tasks and their status are clear. The max limit of current working tasks is two. This is to avoid stacking tasks in the working column. If there is any problem, it can be addressed by raising the issue.

The project UniClubs followed the Kanban board methodology, by creating various milestones and completing them efficiently. This helped in continuous workflow ensuring the tasks and being completed.
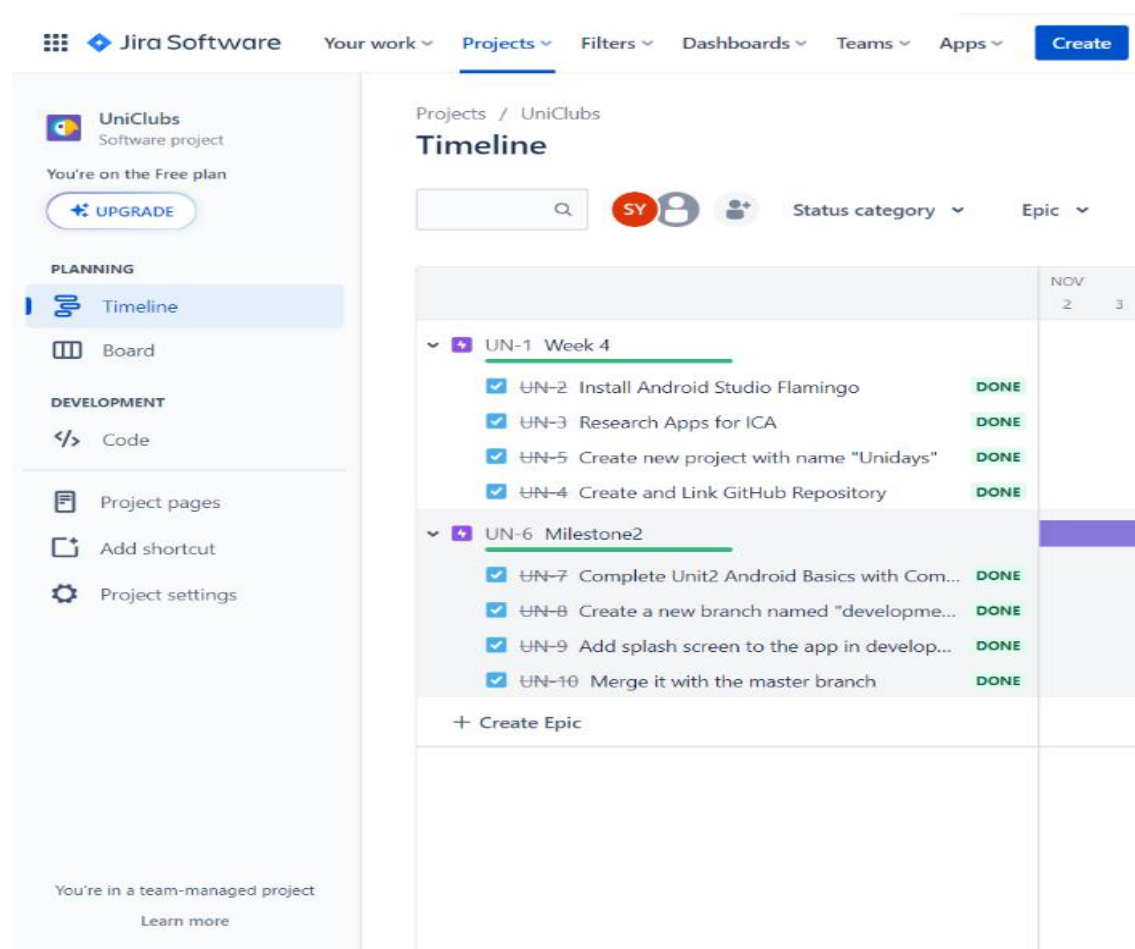
5.2 Milestones

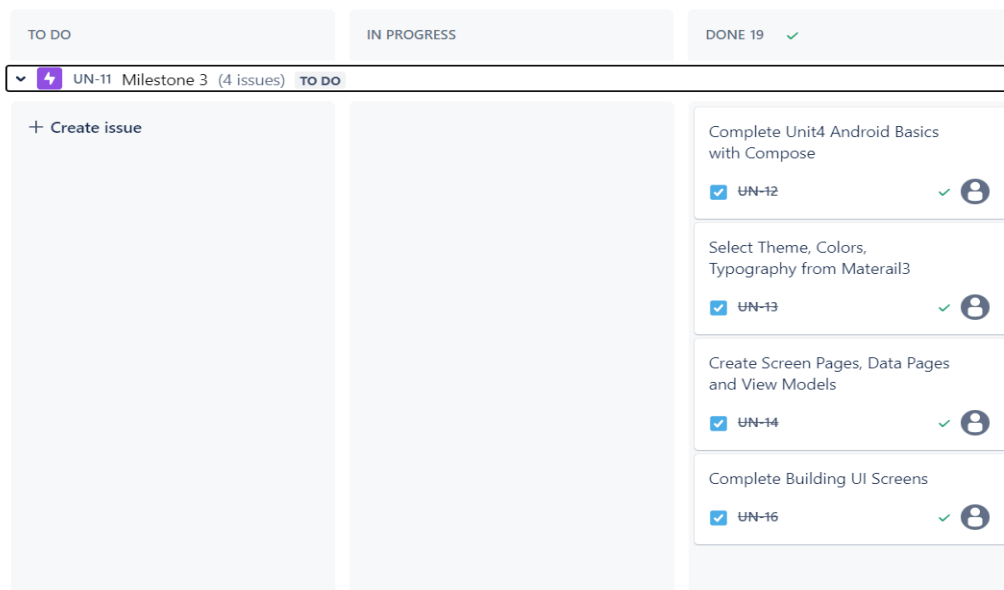Milestone 1 and 2

Figure 12: Milestones 1 and 2

Milestone 3

Figure 13: Milestone 3
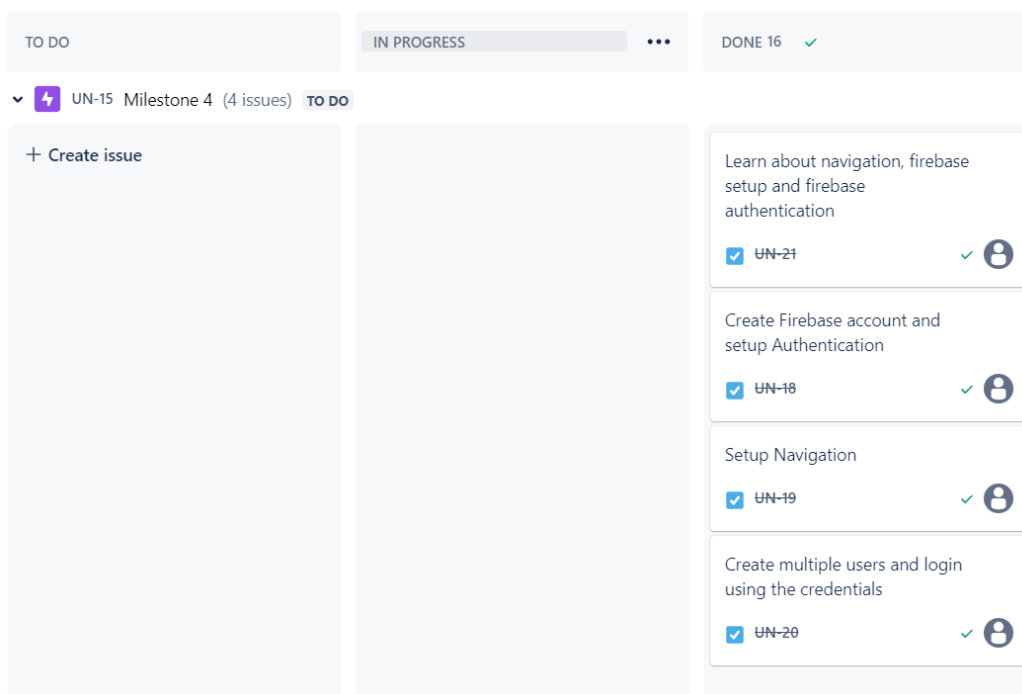
Milestone 4

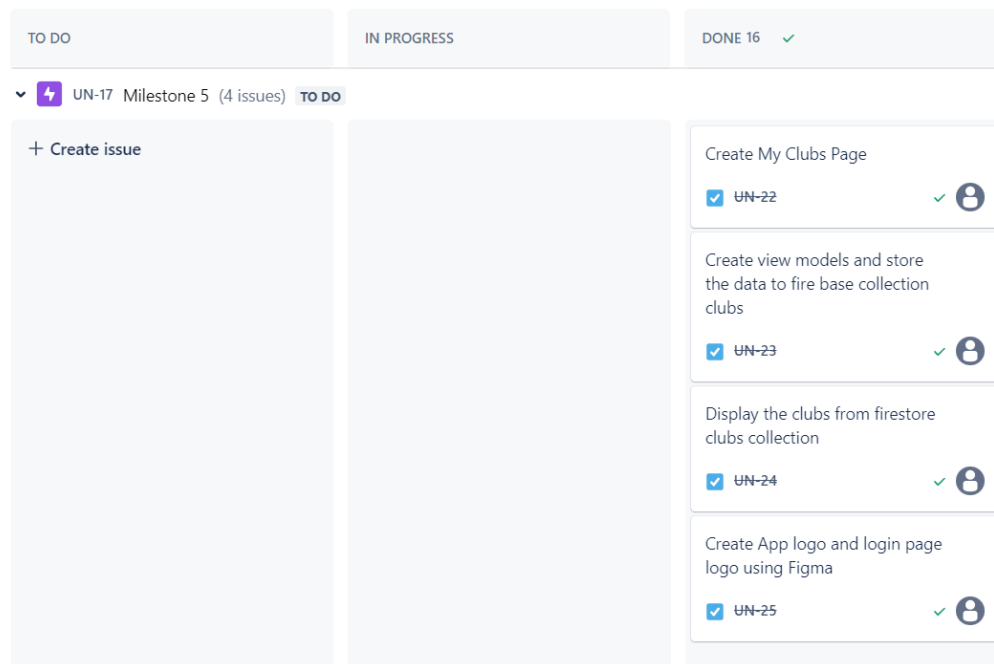*Figure 14: Milestone 4*

Milestone 5

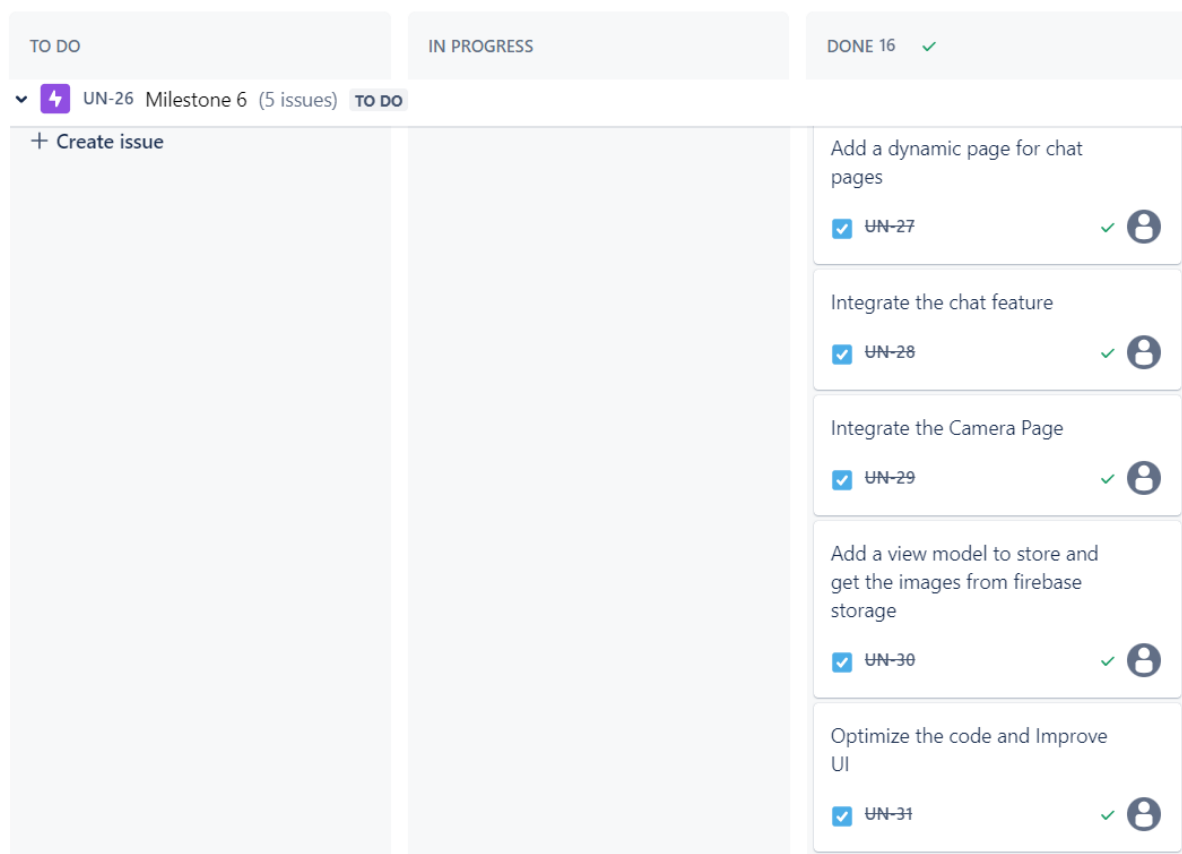

Figure 15: Milestone 5

Milestone 6

Figure 16: Milestone 6

6. Digital Tools

6.1 GitHub for Version Control System

Version control is very important in software development as it tracks the code changes over time. GitHub is one of the version control systems which uses git and allows the entire team to work on a single project. GitHub also acts as a backup of the project. In addition, all the team members can add, change, or merge the code.

GitHub is used extensively for developing the UniClubs project. Master and development branches are used in UniClubs, all the new features are developed and tested in development branch. If they are working as expected, they are committed and pushed to the repository. Then the changes are merged into the master branch.

If a feature is not working or the entire code is flawed, it can be easily rolled back to the previous version. This helped a lot to maintain and develop the code.
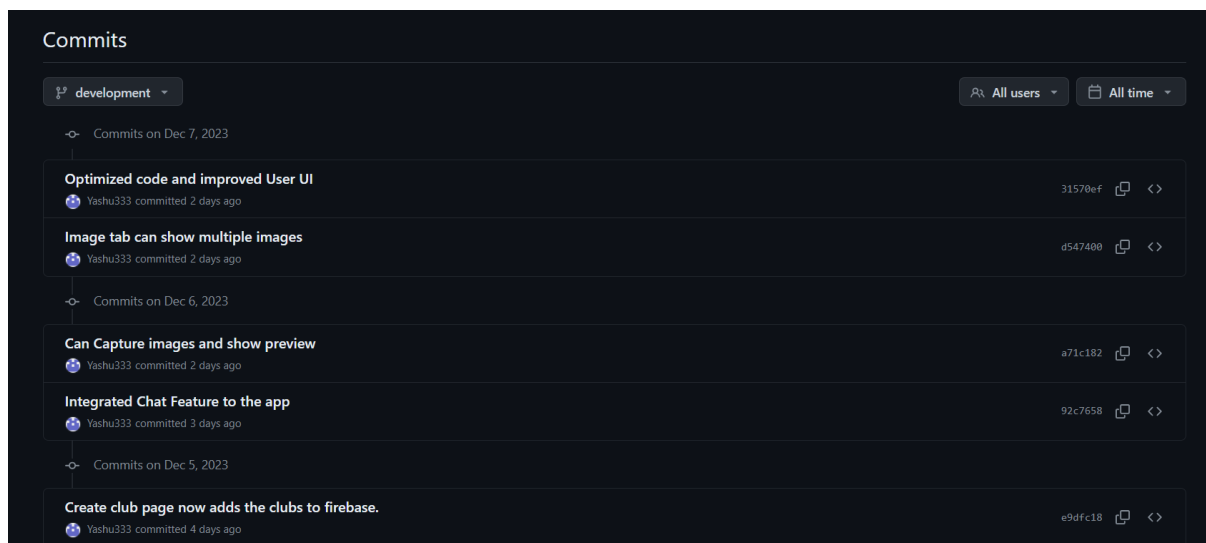
These are the latest commits.

Figure 17: GitHub Commits

If you explore any commit, the red color means the code is cleared, and the green means the code is added.

```
53   68                      )
54   69                      Spacer(modifier = modifier.height(8.dp))
55   -                       Image(
56   -                           painter = painterResource(id = R.drawable.sportsclub ) ,
     70   +                   // Display the selected image or a placeholder
     71   +                   AsyncImage(
     72   +                       model = selectedImageUrl,
57   73                          contentDescription = null,
58   74 +                        modifier = modifier
59   -                               .clip(RoundedCornerShape(16.dp))
     75   +                           .height(150.dp).padding(start = 30.dp, end = 30.dp).clip(RoundedCornerShape(16.dp)),
     76   +                       contentScale = ContentScale.Crop
60   77                      )
61   78                      Spacer(modifier = modifier.height(8.dp))
62   -                       Button(onClick = { /*TODO*/ }) {
63   -                           Text("Upload File")
     79   +                   Button(onClick = { dialogOpenState.value = true }) {
     80   +                       Text("Select Image")
64   81                      }
65   82                      Spacer(modifier = modifier.height(28.dp))
66   83                      TextField(
67   -                           value = title,
68   -                           onValueChange = {title = it},
     84   +                       value = title,
     85   +                       onValueChange = { title = it },
69   86                          label = { Text("Title") },
70   87                          singleLine = true,
71   88                      )
```

Figure 18: Exploring Commit

The GitHub link for the UniClubs app is https://github.com/Yashu333/UniClubs

6.2 Figma for design

Design is a very important step for developing any application. It provides a layout of what to do and how to display the UI. Using Figma saves you time because of the clear-cut design, in contrast if you don't have the design beforehand, it will take more time to finalize the UI. Design also helps to visualize the concepts.

12

UniClubs made all the wireframes using Figma. It helped to focus on coding instead of worrying about the design part. These are all the wireframes:
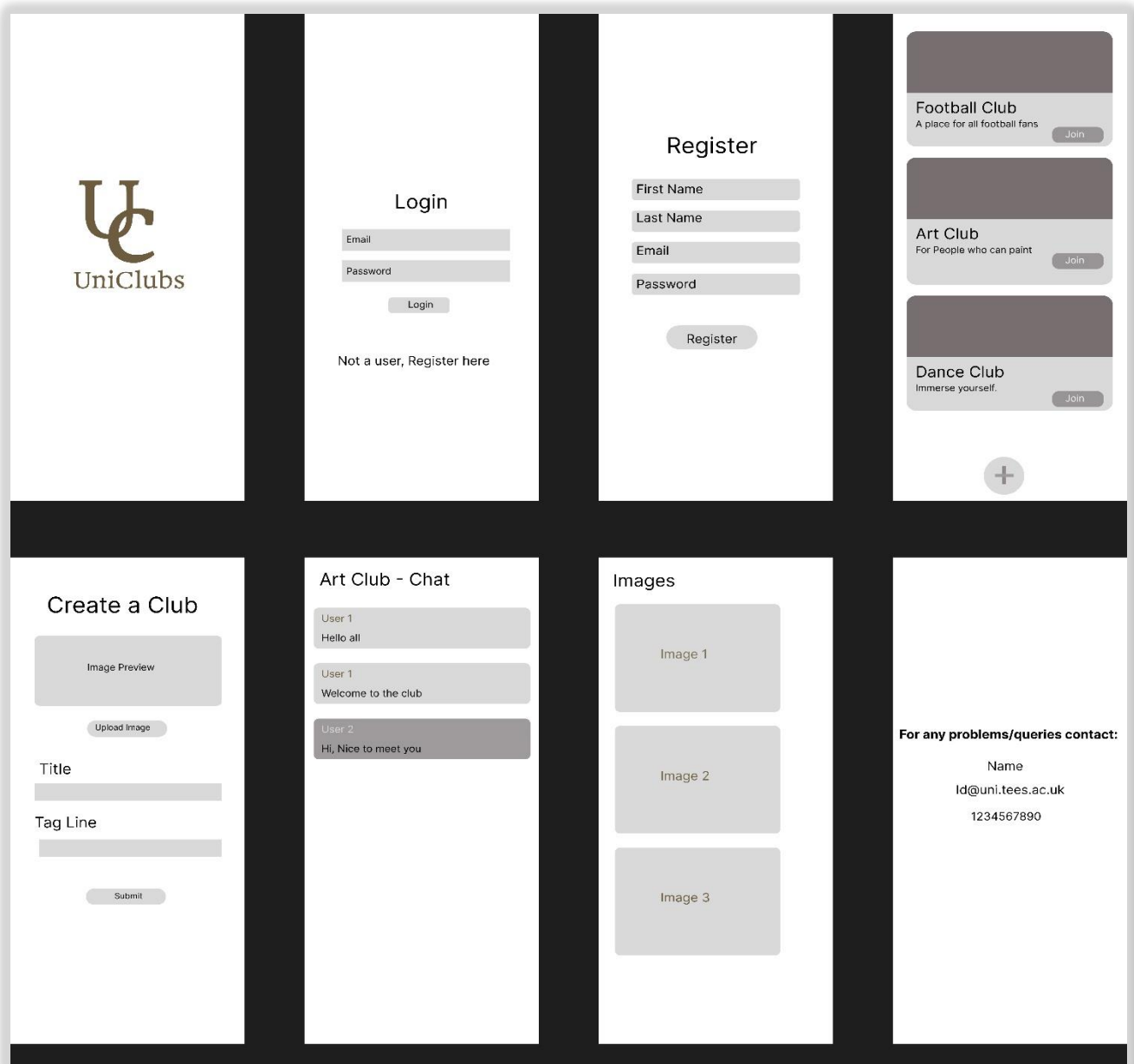

Figure 19: Figma Designs

The design link is https://www.figma.com/file/a4dEawktAJormbWDT1p7ys/UniClubs-Screens?type=design&node-id=0%3A1&mode=design&t=NfTsNonACsyt6Oqo-1

6.3 Jira for Project Management

There are various tools to use for project management, but Jira is chosen over others because of its support for various agile methodologies. All the tasks for milestone are listed out using the timeline feature and completed using kanban methodology.
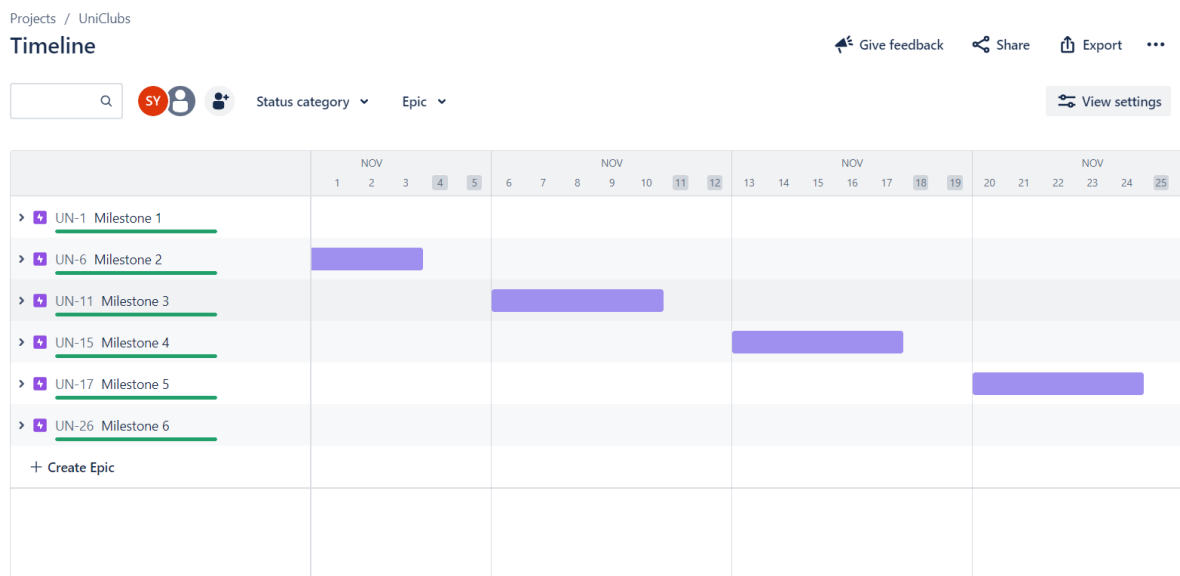

Figure 20: Jira Timeline

7. Conclusion and Future work

To conclude, this report has discussed all the aspects of the application. All the software decisions including implementation, design, usage of various libraries are justified. The social, legal, professional, and ethical issues faced while developing and using the app are discussed. Use of agile project methodology and various digital tools like Figma, GitHub and Jira are explained and demonstrated.

UniClubs is a great app for students to socialize and improve their skills, make new friends and maintain academic life balance. There is a scope for various improvements into this app, which will boost its usage and popularity, Various features like social media integration, and more customizations can be added.

8. References

Kotlin Help. (n.d.). *Kotlin docs | Kotlin*. [online] Available at: https://kotlinlang.org/docs/home.html (Accessed 2 Dec. 2023).

Association for Project Management (2019). *What Is Project Management?* [online] Apm.org.uk. Available at: https://www.apm.org.uk/resources/what-is-project-management/ (Accessed 5 Dec. 2023).

Agile Alliance (2019). *What is Agile Software Development?* [online] Agile Alliance. Available at: https://www.agilealliance.org/agile101/ (Accessed 5 Dec. 2023).

Kanban Software for Agile Project Management. (n.d.). *What Is a Kanban Board and How to Use It? Basics Explained.* [online] Available at: https://businessmap.io/kanban-resources/getting-started/what-is-kanban-board (Accessed 7 Dec. 2023).

Coursera. (2023). *What Is GitHub and Why Should You Use It?* [online] Available at: https://www.coursera.org/articles/what-is-git (Accessed 7 Dec. 2023)

The Importance of Layout in Graphic Design - Gold Rabbit Ltd. [online] Available at: https://goldrabbit.co.uk/the-importance-of-layout-in-graphic-design (Accessed 9 Dec. 2023).