Wild Commons

Abdiel Macías
TIDSM3A
UTR Aguascalientes, México
st4176@utr.edu.mx

Gael Ruíz
TIDSM3A
UTR Aguascalientes, México
st4790@utr.edu.mx

Javier Santos
TIDSM3A
UTR Aguascalientes, México
st4578@utr.edu.mx

Jared Rodriguez
TIDSM3A
UTR Aguascalientes, México
st4371@utr.edu.mx

Rodrigo Zamacona
TIDSM3A
UTR Aguascalientes, México
st4256@utr.edu.mx

Abstract—**This week, we focused on developing the functional views for our library resource management application. Specifically, we created an interactive resource map that displays the availability of library resources such as computers, cubicles, and the general room. Additionally, we designed a user ID entry screen to link each user with the resource they are reserving. These views are key to managing real-time interactions between users and library resources. Overcoming challenges related to interface responsiveness and clarity, we ensured the design meets usability standards for different user roles.**

Keywords—**Library app, Resource map, User interface, User ID, Android Studio**

I. Introduction

The development of our library resource management application has reached a crucial phase this week, where we have begun to create the core functional views that will drive user interaction with the system. The application is designed to streamline the process of resource allocation within the library, specifically focusing on computers, cubicles, and the general room. The interface needs to be intuitive and efficient to cater to different user roles, including students, teachers, and external users.

A. Overview of the project

The project aims to create a mobile application for managing the entry and use of library resources. These resources include 27 computers, 5 cubicles, and a general study area. The goal is to provide users with a real-time overview of resource availability and allow for seamless interaction through user identification, ensuring that each resource is used efficiently and logged accordingly. This week, we focused on building the functional resource map and user ID entry view, which are essential for tracking and managing these resources in real time.

B. Objectives and goals

The primary objectives of this project are to:

- Developing an interactive resource map that shows real-time availability.
- Creating a user ID entry screen to link users to the resources they reserve.
- Ensuring that both screens are visually clear, easy to navigate, and function seamlessly together.

II. Weekly Entries

A. Week 1 (October 7 - October 13, 2024)

1) Activities:

- Design and development of a user-friendly web-based interface for administrators to monitor resource allocation and utilization.
- Implementation of a mapping system to visualize resource status in real-time.
- Creation of a logging section to track user activities.
- Development of a complaint management section to facilitate prompt issue resolution.
- Writing PHP code to connect to the database.
- Writing PHP code to perform CRUDs (Create, Read, Update, Delete) operations using SQL statements, such as selecting data, inserting new records, updating existing records, and deleting records.

PHP and MySQL are a powerful combination for building dynamic web applications, and with the right tools and techniques, you can create robust, scalable, and secure web-based resource management systems. (1).

2) Challenges:

- Designing a user-friendly web-based interface that effectively displays resource allocation and utilization data.
- Integrating the mapping system with the database to provide real-time resource status updates.
- Ensuring the security and integrity of the database connection.
- Slowness and inefficiency were experienced in CRUD operations.

The design and implementation of a web-based admin panel system requires careful consideration of user needs, system functionality, and technical requirements.(2).

3) Solutions:

- A responsive and intuitive web-based interface was designed using HTML, CSS, and JavaScript to provide administrators with a clear view of resource allocation and utilization.
- The MySQLi extension was used to establish a secure connection to the database, ensuring the integrity of the data.
- Optimized SQL statements were used to perform CRUD operations, minimizing latency and improving user experience.

4) Reflections:

- We learned that taking the time to thoroughly plan and design each component of the project is crucial to its success.
- We realized that combining different technologies and tools can lead to innovative solutions that might not have been possible with a single approach.

B. Week 2 (October 14 - October 20, 2024)

1) Activities:

- First, we conducted extensive research on best practices for designing tablet interfaces. This included reviewing existing applications and collecting ideas on how to optimize the user experience on larger devices. The research helped us identify effective design patterns and better understand users' expectations for usability and aesthetics.

- Then we focused on developing the first functional views for the library entry app, designed specifically for tablets in Android Studio. We created the main screen, where users will interact with the system, and the role selection screen, which allows users to choose their role (student, teacher, administrative or external).
- We also have to develop a section for external users, where they must fill out a form to access Learning Commons. These screens will serve as the basis for the next stages of application development.

Building successful software requires careful planning, architectural design, object relationship design, modular component design, database design, planning for maintainability, deployment, quality assurance, and much more. (3)

2) Challenges:

- One of the main challenges was to ensure that the application interface was intuitive and responsive across different devices, especially tablets. This involved considering how users would interact with the application on larger screens and in different orientations.
- The adaptation of the interface elements to the dimensions of the tablet screen presented difficulties. We needed to create a design that worked well in various configurations, which required careful approach on the layout and size of components.
- Designing an accessible and easy-to-fill form for external users was an additional challenge. It was crucial that the information requested be clear and concise to facilitate access to the library.

3) Solutions:

- Research into best practices in tablet interface design provided us with valuable ideas that we implemented into the design. This helped optimize the user experience and align us with the expectations of the target audience.
- To address responsiveness issues, we refined the design using Constraint Layouts in Android Studio. This allowed us to ensure compatibility with the tablet's screen size and create a more flexible and adaptable interface.
- As for the external aspects, we designed a simple and direct form. We made sure that the fields were clear and that the information required was

minimal but sufficient, thus facilitating the entry process.

4) Reflections:

- This taught the importance of establishing a solid UI foundation before moving on to more complex functionalities. Good initial design is essential for project success.
- We learned to better structure the user experience to accommodate different roles, which is crucial for the effectiveness of the application. Each role should feel comfortable and understood when interacting with the system.
- The research not only enriched our design process, but also motivated us to continue exploring new ideas and approaches in application development. The constant search for improvements is key to success in software development.

C. Week 3 (October 21 - October 27, 2024)

1) Activities:

- This week, we focused on creating two main functional views in Android Studio for our library resource management app. The first was the interactive resource map, which visually displays the availability and status of different resources such as computers, cubicles, and the general room, as shown in the image. We ensured that the resources were represented clearly and could change states (free, busy, or under maintenance).
- We also developed a user identification screen, which allows users to input their ID after selecting the library resource they want to use. This was designed with simplicity in mind to streamline the process of resource allocation and user tracking.

When you build cross-platform applications with IOS, Android, and JavaScript SDKs, the greater part of your customers' demand is based on one Real-time Database instance and consequently getting updates with the most current data. A Database is an organized collection of data. Databases can be stored locally on your computer or can be stored in cloud storages. Every application whether android, IOS or web application, it has its own database. (4)

2) Challenges:

- Designing the interactive map was one of the significant challenges, as we needed to ensure that the layout was intuitive and responsive across different screen sizes. The arrangement of computers and cubicles had to be clear while leaving enough space for future components like detailed status overlays.
- Another challenge was implementing the real-time state updates for the resources, ensuring that the user sees the correct availability status when selecting a resource.
- We faced minor difficulties in creating a seamless user identification process that links properly to the resource map and changes the resource's state based on the user ID input.

3) Solutions:

- To handle the design challenge, we used Constraint Layouts and adjusted the grid system to ensure that all resources fit neatly within the screen while maintaining the clarity of the map. We referred to the library's actual layout to model this interactive view more effectively.
- For the real-time updates, we integrated data binding with each resource element so that the map reflects the correct availability status dynamically. We will link this to the database in the upcoming stages.
- Regarding the user ID input screen, we designed a simple interface where users can easily enter their ID, and we ensured that the system immediately recognizes it, linking the ID to the correct resource.

4) Reflections:

- This week, we learned the importance of accurate resource visualization and how crucial it is to present information clearly when dealing with multiple user roles and resources. The visual aspect greatly enhances user experience.
- The real-time aspect of the application introduced us to handling dynamic data updates within a visual interface, an essential skill for future features like resource tracking.
- Building the user ID screen taught us about smooth user authentication and its integration with resource allocation. Overall, we feel that the solid progress made this week has built a strong foundation for the app's functionality.

III. Conclusion

A. Summary of the overall progress

This week saw substantial progress with the creation of two essential views: the interactive resource map and the user ID input screen. These are the foundation of the app, as they will be the primary

means through which users interact with the library's resources. The visual design was carefully crafted to ensure clarity and responsiveness, while the logic behind the real-time updates began to take shape, laying the groundwork for future integration with the database.

B. Final reflections

This stage of the project highlighted the importance of a well-structured user interface, especially when managing multiple resources and user roles. Developing these views has deepened our understanding of how crucial it is to make dynamic updates to the user experience in real time. Moving forward, we are confident that the strong foundation we have built this week will support the more advanced features of the application. The lessons learned about design, user interaction, and dynamic resource management will continue to guide our development process.

References

[1] L. Welling and L. Thomson, *PHP and MySQL Web Development.* Sams, 2nd ed., 2003.

[2] Y. Jiang, H. Zhan, and Z. Huang, "Design and implementation of a general web-based course teaching management system," *International Journal of Educational Management Engineering*, vol. 2, Nov. 2012.

[3] J. Lehtimaki, *Smashing Android UI: Responsive User Interfaces and Design Patterns for Android Phones and Tablets.* Smashing Magazine Book Series, Wiley, 2012.

[4] S. Khedkar and S. Thube, "Real time databases for applications," *International Research Journal of Engineering and Technology*, vol. 4, no. 6, 2017.