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Section: 07

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Group No.: 05

Title: Library Management System

Link: https://drive.google.com/drive/folders/1g5evyPrxYxzVw_1FBZ4-n-adlIvNFstM?usp=drive_link

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● Introduction

Libraries have remained part of the strong pillars in achieving academic success, equipping students with fundamental elements needed in research and learning processes like books, journals, and other digital contents. In addition to their being repositories of information, libraries offer an area for focused study and intellectual collaboration. Thus, it facilitates students in meeting set academic objectives. With such qualities, they easily rank as indispensable learning centers.

However, libraries face challenges that limit their accessibility and impact. Students often struggle with locating resources due to complex catalog systems or outdated search tools. Borrowing systems can be inefficient, with restrictive policies or lengthy wait times, while limited study areas fail to accommodate growing student needs. Such issues hinder libraries from fully supporting students' academic pursuits.

These are challenges that require a structured process to meet, such as a design thinking cycle that integrates emphatic, creative, and collaborative problem-solving. In engaging the students in the understanding of their needs, innovative solutions can be derived for resource access, borrowing systems, and study environments. This will ensure libraries remain adaptive, user-friendly spaces that empower students and enhance their academic success.

Phase 1: Empathize

Objective:

To comprehend fully the needs, frustrations, and expectations of the students and library staff as users of the system, university library.

Activities done:

- a. Interviews with Students:

Participants:



Students of different courses and years.

Sample Questions:

What challenges do you face in locating books or resources?

How will you describe your experience with the borrowing/returning of the books?

Usually, do you find a good place to study when needed? If not, why?

What would be an ideal library system for you?

Other frustrations or improvement ideas?

Insights:

1. 80% of students feel it is hard to locate books without the help of staff,
2. 40% said it is taking so long for them to borrow books,
3. 60% reported that it is hard to find available study spaces during peak hours.

Observation of Library Use:

Observing how students behave in the library, especially during peak periods of the academic calendar, like midterm examinations and week before finals.

Findings:

1. Students would often roam around shelves looking for books.
2. There are overcrowded study areas with students reserving seats for hours.
3. The long queue is observed in the borrowing counter, most especially during lunch hours.

Library Interviews with Staff Members:

Participants: 2 library staff members.

Sample Questions:

What are the common complaints/questions from students?

How do you currently help students locate resources?

What improvements will make your work easy but also enhance students' experience?

Insights:

1. They require a lot of time helping students find books.
2. Most students do not even have great knowledge of digital resources.
3. Staff suggested improvements of a better digital system for managing borrowings and returns.

User Persona



Name: Ahmed

Age: 22

Background: A third-year Biomedical Engineering student suffering from heavy workload and great deadlines.

Needs:

- Rapid access to all the academic books and journals.
- A quiet, comfortable space to study.
- An organized and efficient borrowing and returning process.

Pain Points:

- Wasting time finding sources.
- Free study space is not available at peak hours.
- Waiting in line for a long time at the borrowing desk.

Goals:

- Spend less time navigating the library.
 - An organized, user-friendly system so that her studying experience can be enhanced.
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Empathetic Insights:

Based on the interviews and observations, here is what the users are looking for and need help with:

Primary Needs:

- a. A speedy reliable system for finding books and other resources.
- b. Information in real time about available study spaces.
- c. An efficient system of lending and returning items.

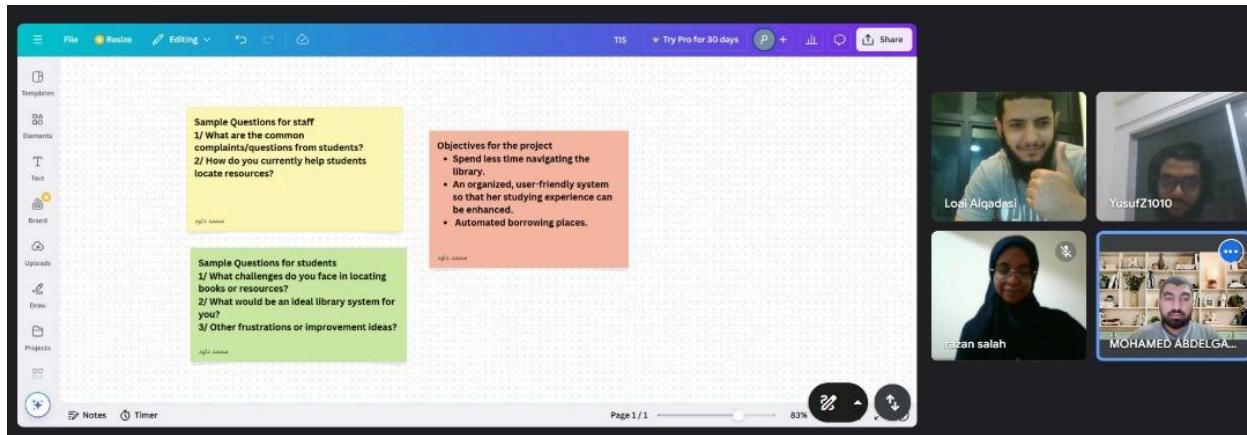
Frustrations:

The navigation of the library without the help of a guide is difficult.

Little knowledge about the digital resources that are available.

Study areas are too crowded in peak hours.

Next Steps:



Phase 2: Define

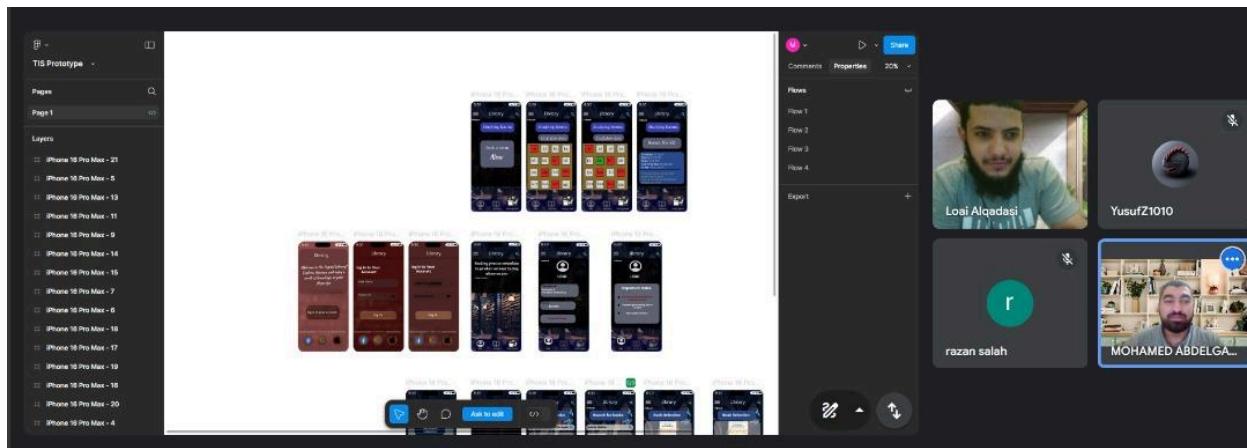
Statement of the Problem:

The university library faces inefficiencies in resource discovery, borrowing processes, and space management, causing frustration for students and staff. Outdated catalog systems and poor organization make finding materials time-consuming, while restrictive lending policies and delays complicate borrowing. Additionally, crowded and poorly managed study areas hinder effective use of library spaces. These issues waste time and reduce the library's ability to support academic success, necessitating improvements for a more efficient and user-friendly environment.

Phase 3: Ideate

The intent:

Creative solutions generation.



Activities:

Team brainstorm on sticky notes and a whiteboard.

Solutions proposed:

- A mobile app with library navigation and study space booking.
- Automated borrowing places.
- AI-powered personalized book recommendations.

Evidence: Photos of brainstorming sessions. Mind maps showing categorized ideas.

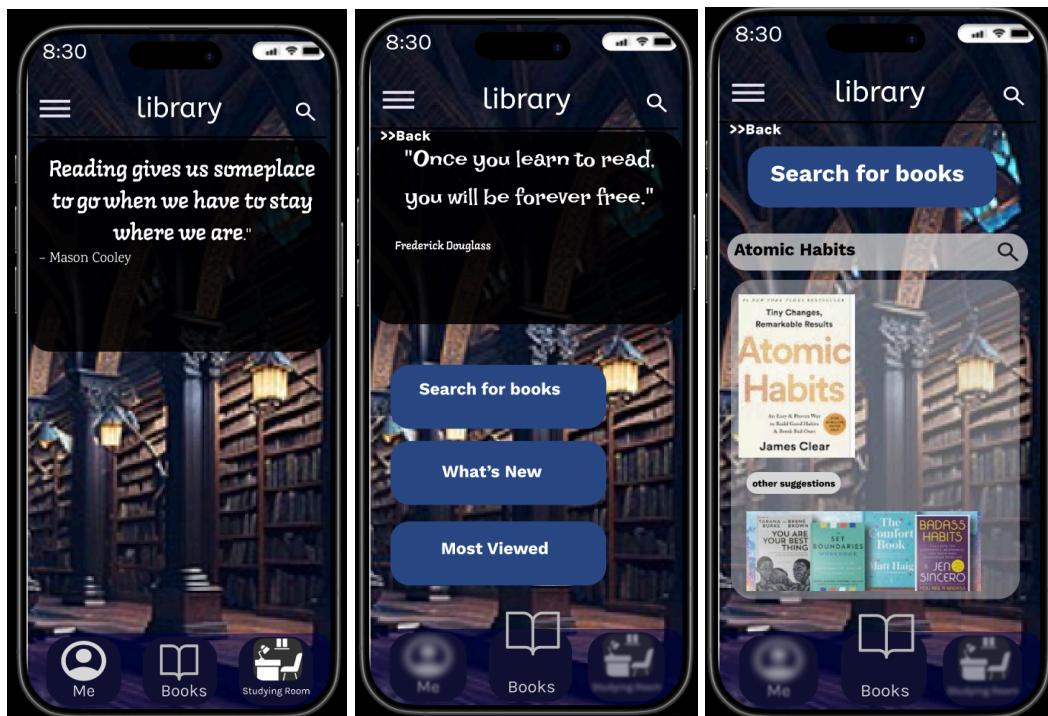
Phase 4: Prototype

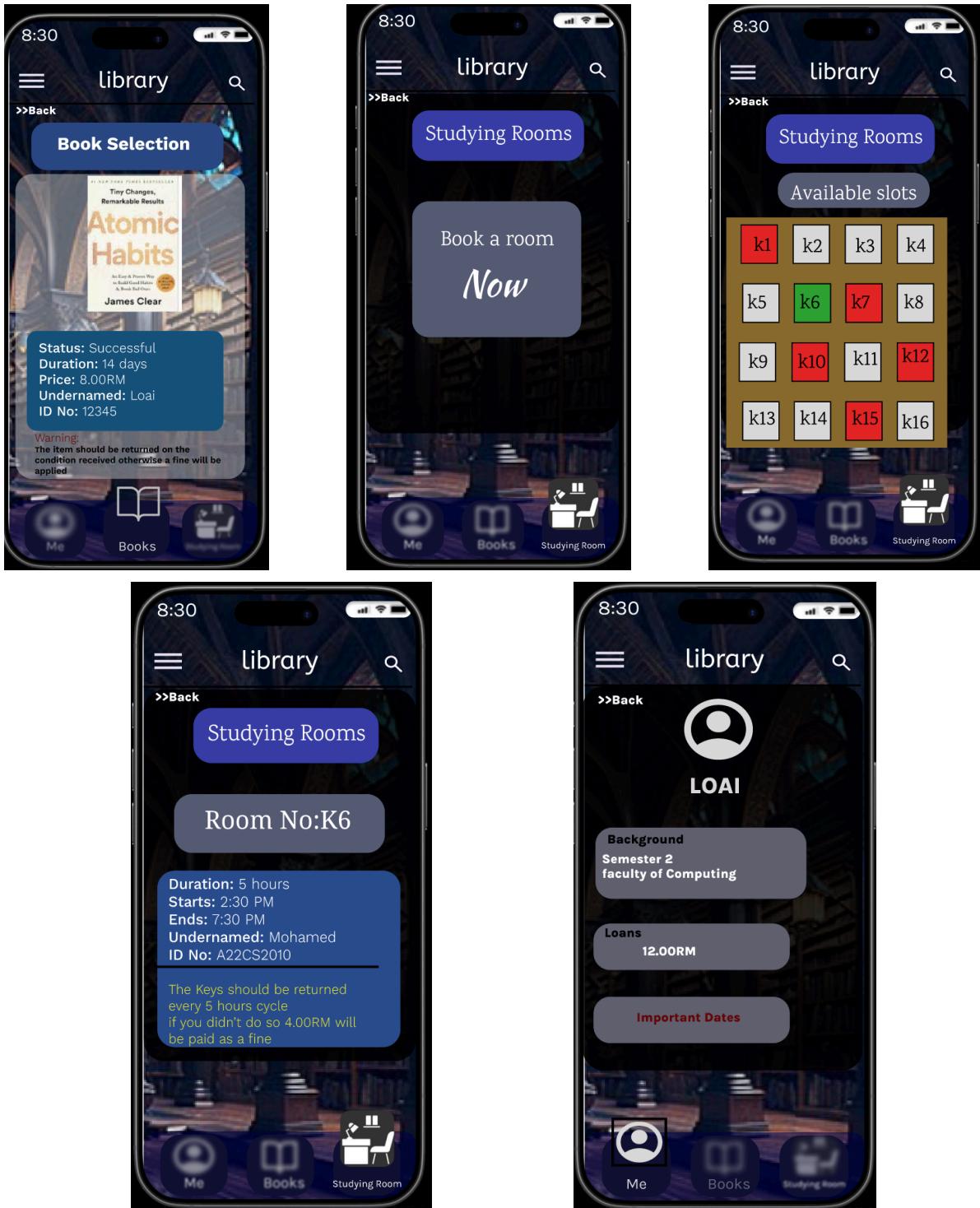
The goal is to create prototypes to show users their opinion .

Activities:

Created a mobile application with Figma for navigation and booking study space.

Evidence: Screenshots from the app prototype that show:





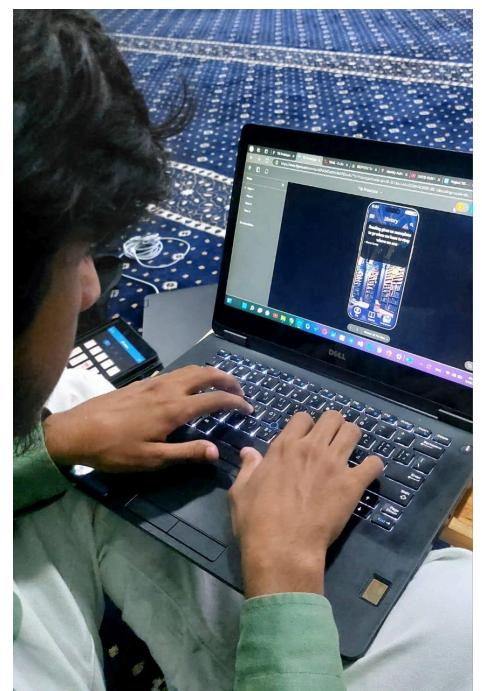
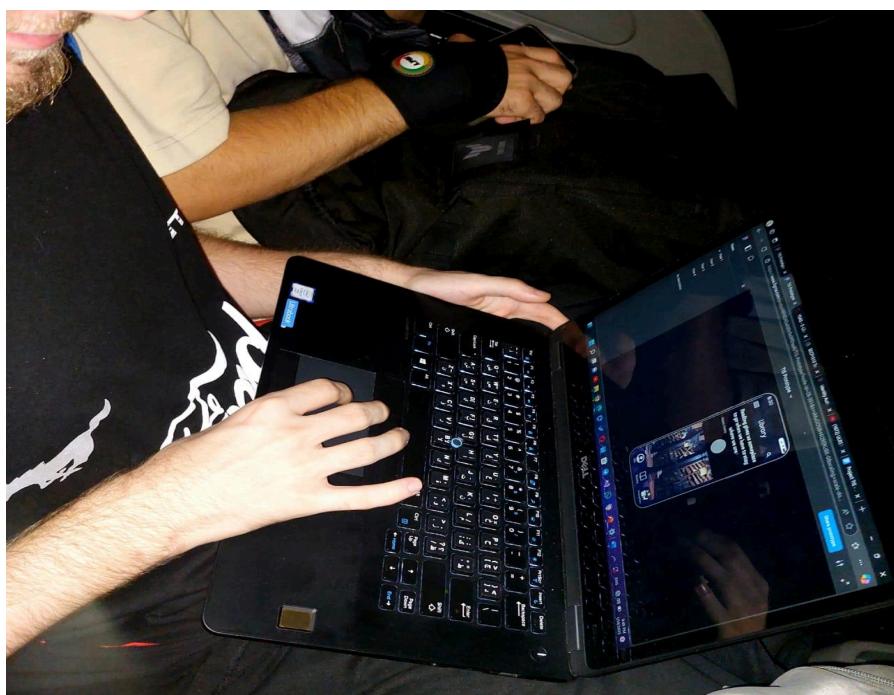
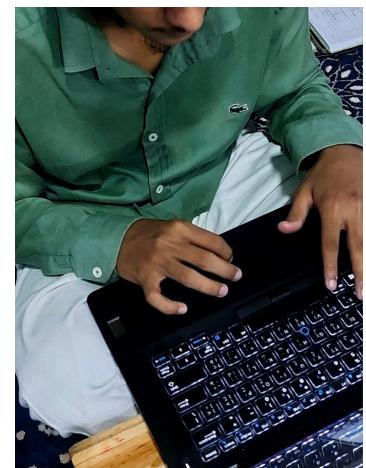
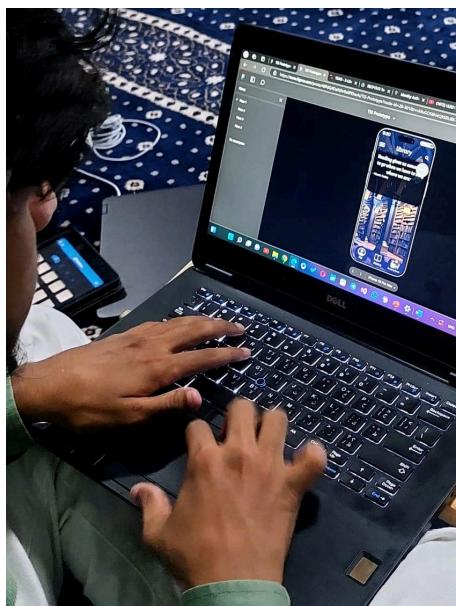
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- Search facility.
- Study space reservation interface.
- Photos of the booking model.

Phase 5: Testing

Objective:

To have users validate the solutions.



Activities:

The application was tested on 10 students.

Feedback included:

90% found the navigation intuitive.

Proof:

Feedback summary table.

Images of students interacting with prototypes.

Participant Name	Prototype Interacted With	Feedback Summary	Suggestions for Improvement
Ahmed Fariz	Book Search Interface	The search feature is intuitive but could use filters for category and publication year.	Add advanced search options and an auto-suggest feature for better usability.
Akram Ali	Borrowing System	The borrowing process is straightforward, but the notifications are delayed.	Ensure real-time notifications and add an option to track borrowed books easily.
Ahmad Galal	Library Map	The map helps locate books but lacks a zoom-in feature for better clarity.	Include a zoom feature and a legend for different sections.
Yussef Saleh	Mobile App Integration	The app is user-friendly, but login times are slow.	Optimize the login process and consider adding biometric login options.

3. Problem, Solution, and Teamwork

Problem:

Inefficiencies characterize resource discovery and management in the university library.

Solution:

A mobile application and automated kiosks designed to increase accessibility and improve operations.

Teamwork:

Yussuf: Conducted user research.

Mohamed abdelgawwd: Designed the prototypes of the application.

Razan: Supervised testing and analysis of feedback.

Loai: Film, then report it.

4. Points of Assessment of Design Thinking

- At the end of the project during user testing and feedback collection.
 - At the end of every design thinking phase to evaluate the progress and pivot if necessary.
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5. Design Thinking Evidence

Artifacts:

Personas, brainstorming outputs, prototypes, and test results.

Screenshots and photos documenting each phase.

6. Reflections (Individually)

Loai AlQadasi:

Goal: Developing meaningful yet technology-based solutions to address the world's problems.

Impact: Improving my problem-solving skills and user-centered design abilities.

Plan: Master the advanced UI/UX design and team collaboration tools so that I may become ready for the industry.

Yusuf Zain Elabdin:

Goal: develop a system and gain experience in world of technology to help the human society

Impact: Gained experience in UI/UX design and improved my communication skills with the team.

Plan: gain more advanced experience with the technology and improve more using AI as an assist tool for future projects .

Razan Salah Eldeen:

Goal: My goal was to develop technology-based solutions that address real-world problems. This project taught me to focus on improving student experiences through their use of the university library and how to listen to their stories as a user story.

Impact: Through this project, I gained problem-solving skills and how to find solutions through user stories and their complaints and create a prototype design for the project. I learned during the project that users have a great influence in building the project and that means building the project without user stories and their opinions may lead to complicating the problem and not satisfying the

customer when the project is finished. I also learned how to collaborate with the team.

Plan: I plan to master prototype design for the project through UI/UX design, improve my team-work skills more, and communicate skills for users and understand them better.

Mohamed Abdalgawwad:

Goal: My goal is to become a good software engineer to develop systems that can help people in their life. Also, I want to establish a technology company to be one of the most important companies in the world.

Impact: This project helped me to improve my design thinking and also learn how I can collaborate with other people that have different perspectives.

Plan: The plan to improve my skills in my major is to take the most important online courses in software engineering and study all my subjects well.

7. Tasks Assigned to Each Member

Razan: User research.

Yussuf: Plan and leadership, review and double-check tasks

Mohamed Abdalgawwd: Create the prototype.

Loai: Test and analyze.