



Project Libby

Final Report

[Website Link](#)

[Github Link](#)

PREPARED BY

Tolentino, John Rico

Ferrer, John Vincent

Roxas, Erik John

Introduction

Project Overview

Project Libby is an AI-driven chatbot and automation system designed to streamline library services at the University of Batangas – Lipa Campus. It allows students to search books, check availability, and request information through a responsive conversational interface. The system integrates AI processing with n8n automation and tools like Gmail, Google Sheets, and Google Docs to ensure fast, consistent, and reliable library assistance while reducing manual workload for staff.

Objectives

- Deploy an AI-powered chatbot for real-time library inquiries.
- Automate book search and availability checking via integrated datasets.
- Provide a responsive interface across mobile and desktop devices.
- Implement secure backend workflows through n8n automation.
- Generate basic usage analytics for monitoring and improvement.

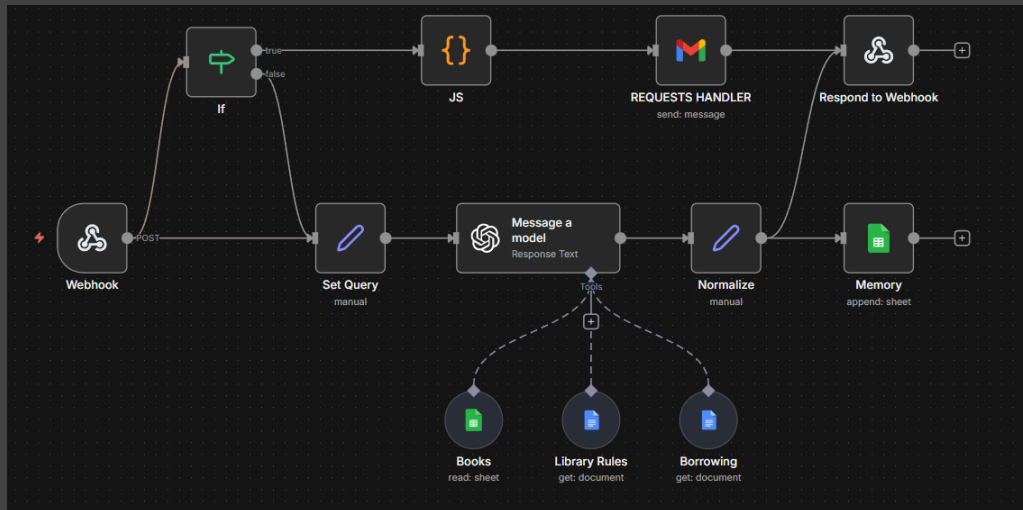
Assignment of Roles

Name	Role	Responsibilities
John Rico Tolentino	Project Lead, Frontend Developer, UI/UX	Oversees the project and develops the responsive user interface.
Erik John Roxas	Backend Developer, Security	Designs backend automation and ensures data security.
John Vincent Ferrer	DevOps, Tester	Manages deployment, GitHub activity, and system testing.

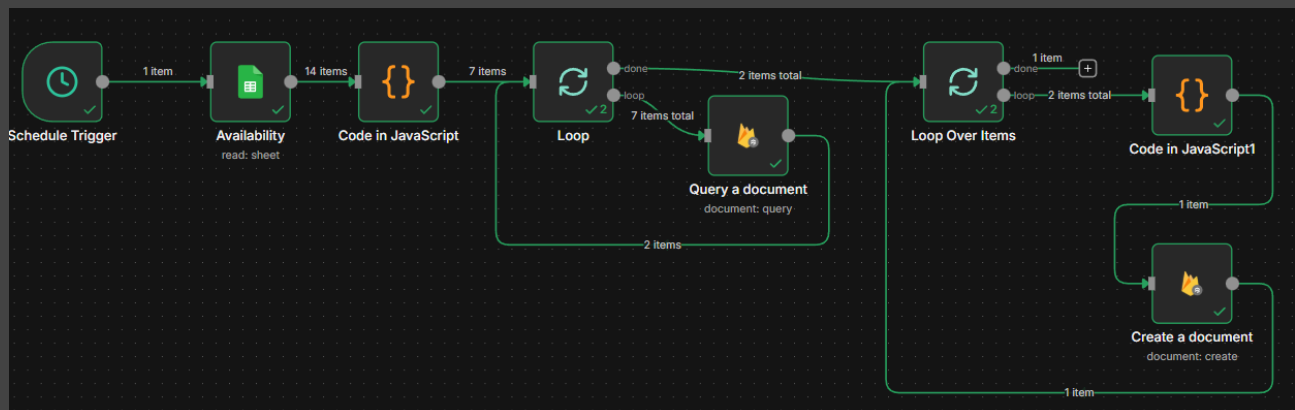
System Architecture

The system architecture manages user interactions through automated workflows, AI assistance, and human oversight. User inputs enter via a webhook, are standardized, and evaluated through conditional logic that routes borrow and reserve actions to administrators while handling general inquiries through an AI model. A scheduled notification workflow monitors book availability and generates notifications when books become available, ensuring efficient, accurate, and well-governed library operations.

General Workflow Diagram



Schedule Trigger for Notifications



Frontend Design

Design System

Dark Glassmorphism Theme - A sophisticated dark mode with modern glass-effect aesthetics

Font Family: Nunito - Modern, friendly sans-serif

Color	Value	Usage
Background	hsl(0, 0%, 0%)	Pure black base
Foreground	hsl(0, 0%, 98%)	Off-white text
Primary (Accent)	hsl(51, 100%, 50%)	Bright yellow

User Experience (UX)


Navigation

- Bottom sticky navigation with 4 items (Home, Chat, Profile, Settings)
- Icons highlight in yellow when active
- Floating Action Button (FAB) for quick chat access

Chat Experience

- Sticky header with back navigation
- Quick suggestion buttons (4 contextual prompts)
- Typing indicator with animated dots
- Input field with attachment and voice buttons
- Save conversation history with timestamps
- One-tap access to common library tasks

Login and Register Interface



Welcome, I'm Libby!

Sign in or create an account

Login


Register

Student Number

Password

Login

No account? [Register here](#)



Welcome, I'm Libby!

Sign in or create an account

Login

Register

Full Name

Year Level

Student Number


Password

Create Account

Already have an account? [Login](#)

Onboarding Page

Skip




Hey! I'm Libby!

Your friendly library assistant at University of Batangas Lipa Campus.

Continue

Skip

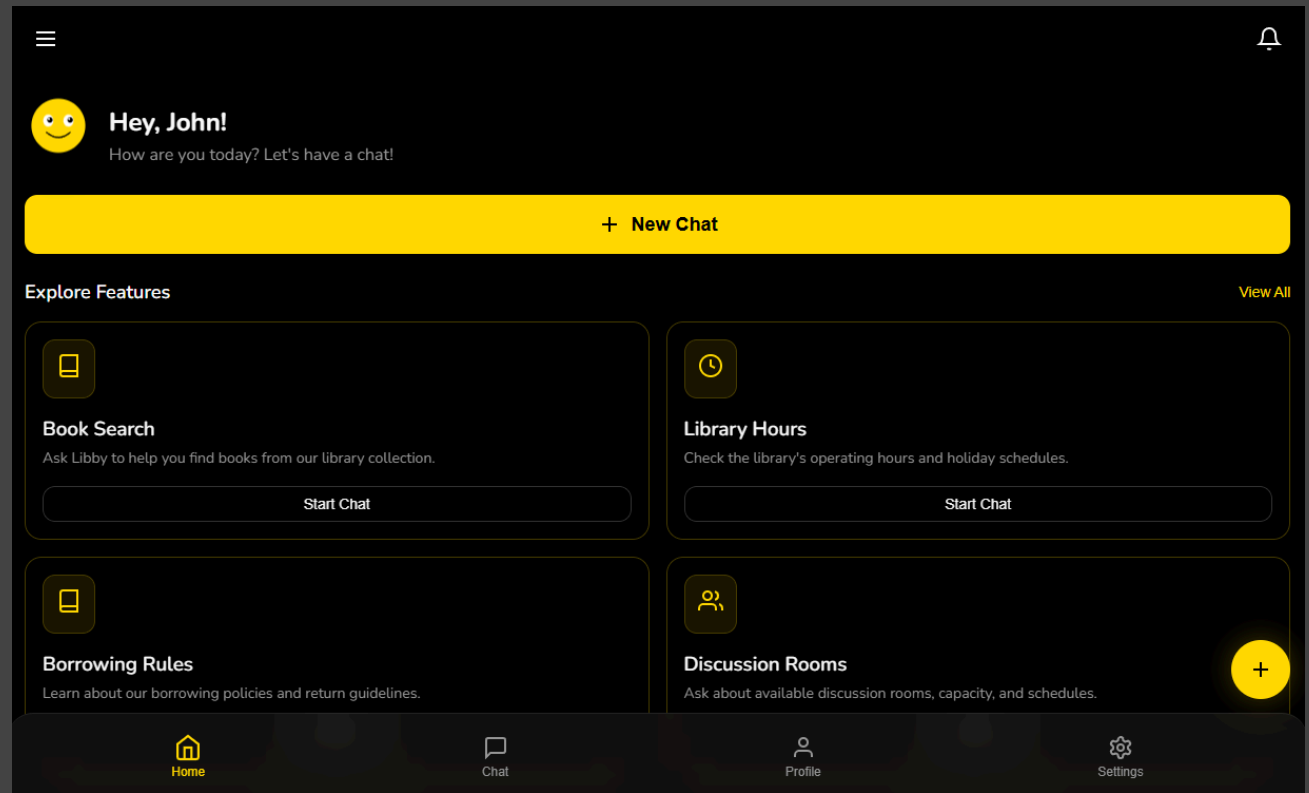


Get Instant Help

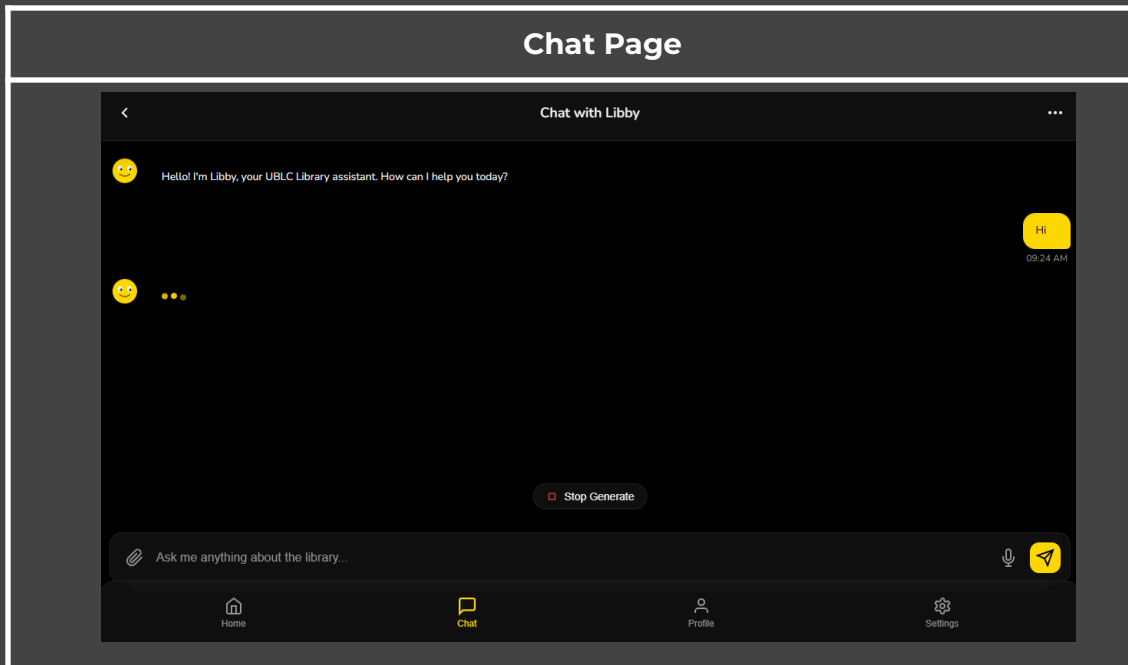
Ask me about library hours, borrowing rules, and available facilities.

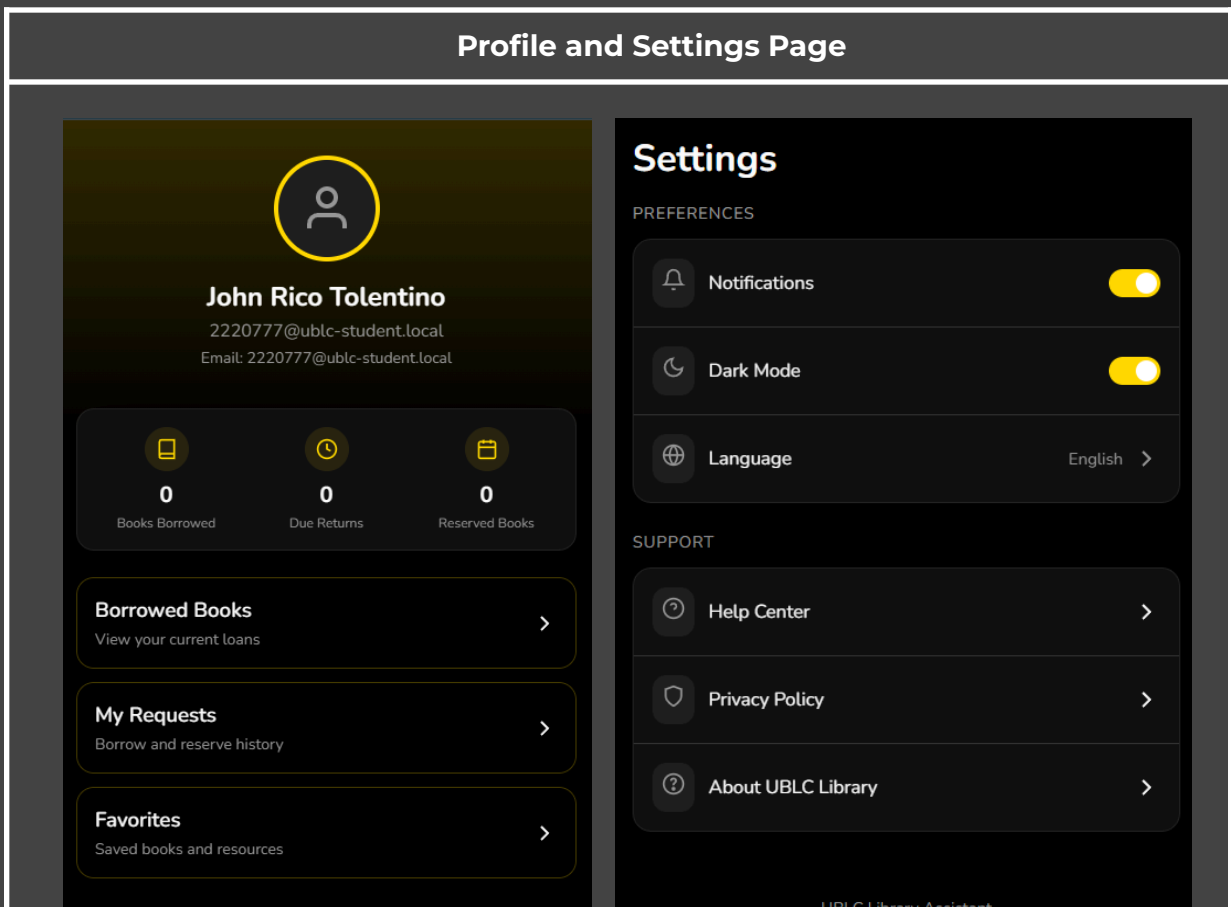
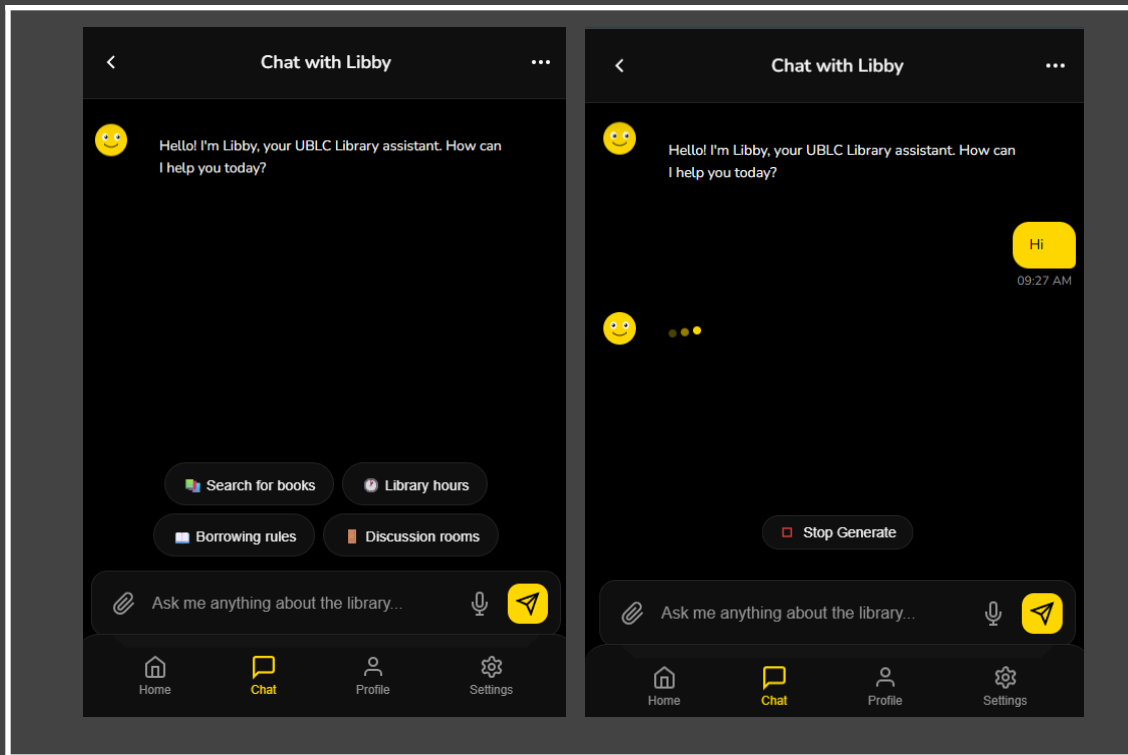
Get Started

Home Page



Chat Page









Backend Process

The backend is implemented using Firebase Firestore and functions solely as a secure data storage layer. It stores notification records generated by the system architecture and is protected by authentication and authorization mechanisms. By separating data persistence from workflow logic, the backend supports scalability, maintainability, and secure handling of system data.

Authentication

Identifier	Providers	Created ↓	Signed In	User UID
2220161@ublc-student...		Dec 13, 2025	Dec 13, 2025	vWLMsn5osUORC3X1r5781RO...
2220777@ublc-studen...		Dec 13, 2025	Dec 13, 2025	ZGlycV9coWUBuFkndIt0YUO...
2340123@ublc-studen...		Dec 12, 2025	Dec 12, 2025	FQYpSN2hGDaeZgSfm90qOI...
2220222@ublc-studen...		Dec 12, 2025	Dec 13, 2025	6NiuZPrAKOaRBZMCiniaMWJT...
Rows per page: 50 1 – 4 of 4 < >				

Firestore Database

ChatLibby

Cloud Firestore

Database

Add database

Ask Gemini about the core concepts to use Firestore

DataRulesIndexesDisaster RecoveryUsageExtensions

Protect your Cloud Firestore resources from abuse, such as billing fraud or phishing

Configure App Check

Panel viewQuery builder

>=users>6NiuZPrAKOaR...>notifications>BoFWGxgZu6A...

6NiuZPrAKOaRBZMCiniaMWJTQK2

+ Start collection

notifications

+ Add field

notifications

+ Add document

51xJu96L4rgwnS9Ffg33

55uGWJ5sSFNZGLlgxT2n

BoFWGxgZu6AzBxMwVEMY

BoFWGxgZu6AzBxMwVEMY

+ Start collection

+ Add field

bookTitle: "C++ Programming"

createdAt: December 13, 2025 at 3:56:25 PM UTC+8

message: "C++ Programming is now available!"

title: "Book Available"

DevOps Lifecycle

The DevOps lifecycle shows how development and operations are combined to build, test, and deploy the Libby AI Automation system efficiently using GitHub tools.

A. GitHub Activity

GitHub is used to store the source code and manage team collaboration. All changes are tracked using commits, allowing the team to monitor progress, avoid conflicts, and restore previous versions when needed.

B. CI/CD Setup

Continuous Integration is implemented using GitHub Actions with Super Linter. The workflow runs automatically when code is pushed or a pull request is created. It checks code syntax and formatting to ensure quality before merging.

C. Deployment Process

The frontend is deployed using platforms such as GitHub Pages, Netlify, or Vercel. The project is built using `npm run build`, and the generated `dist/` folder is uploaded to make the system accessible online.

D. DevOps Lifecycle Flow

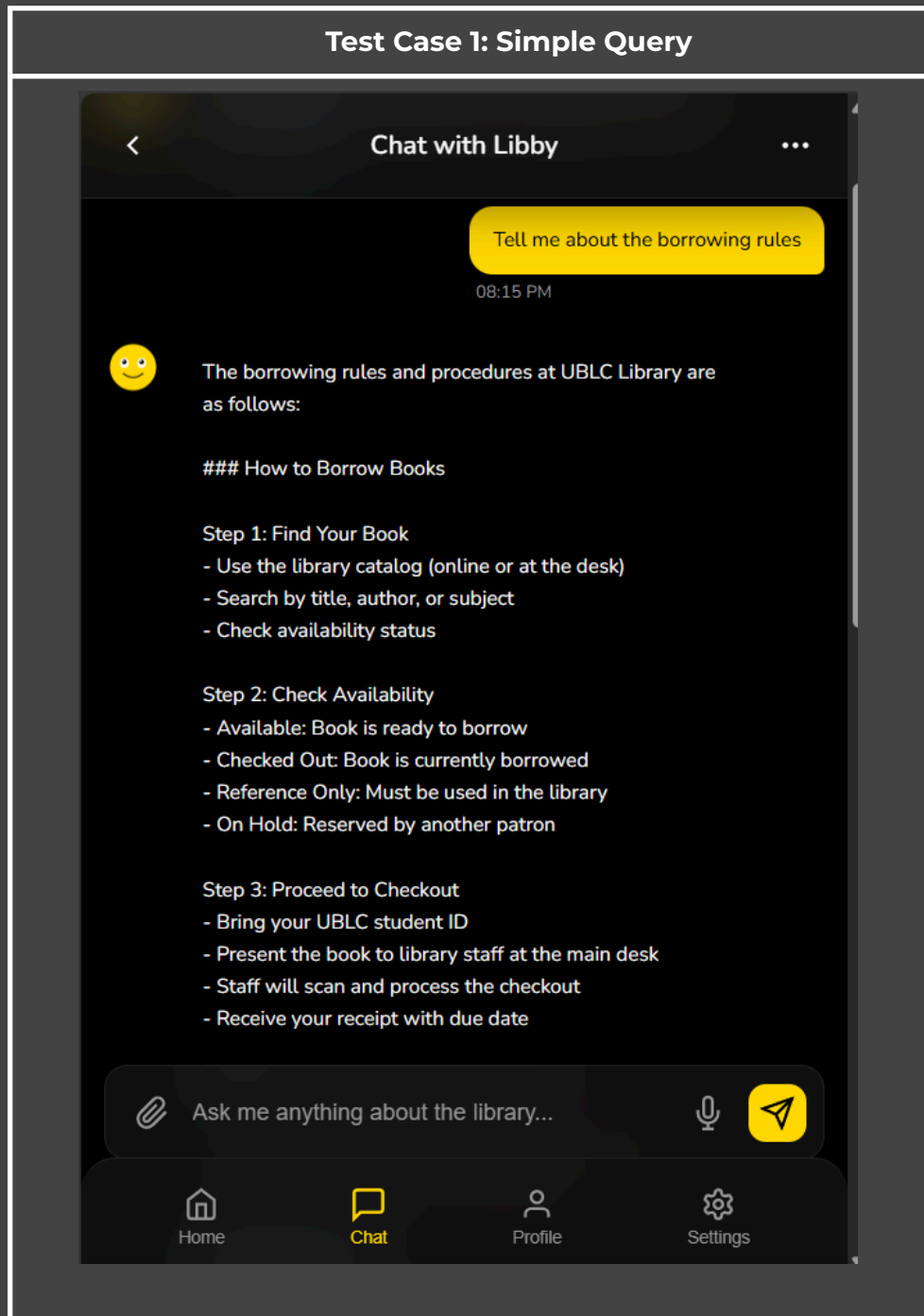
The lifecycle follows:

Plan → Develop → Test → Deploy → Monitor → Improve

Each stage supports continuous updates, quality checks, and system improvement.

Testing

The Sample Q&A section showcases the chatbot's core functions, book searches, library hours, borrowing rules, and room availability, while demonstrating its handling of off-topic queries through redirection. It validates response accuracy and relevance.



Test Case 2: Book Borrowing Request

chatlibby-b9310.web.app says

Borrow request sent! Please collect the book at the library counter with your student ID.

OK

07:39 PM

I want to borrow HTML & CSS

08:07 PM

I found the book you are looking for:

Title: HTML & CSS

Author: Hu Xiaoting

ISBN: 978-0756473625

Location: Shelf A1

Availability: Available

To borrow, bring your UBLC student ID and the book to the library main desk. Staff will assist you with the checkout process.

08:07 PM



roxasejay08@gmail.com

to me

=



New Library Request

Book Details:

Title: HTML & CSS

Action: BORROW

Student Information:

Name: Ban Jo

Email: 2220222@ublc-student.local

Student ID: 2220222@ublc-student.local

Timestamp: 12/13/2025, 8:07:17 PM

Test Case 3: Book Reservation Request



chatlibby-b9310.web.app says

✅ Reservation request sent! You will be notified when the book is available.

OK

07:39 PM



The book "1984" by George Orwell is currently borrowed and not available right now.

Title: 1984

Author: George Orwell

ISBN: 978-0451524935

Location: Not specified

Availability: Borrowed

This book is currently borrowed and not available right now. You can request a renewal twice if the book is not on hold. For now, you might want to wait until "1984" is returned, or you can ask the library staff if they can notify you when it becomes available.

If you have any more questions or need information on other available books, feel free to let me know!



roxasejay08@gmail.com
to me ▾

=

New Library Request

Book Details:

Title: 1984

Action: RESERVE

Student Information:

Name: Ban Jo

Email: 2220222@ublc-student.local

Student ID: 2220222@ublc-student.local

Timestamp: 12/13/2025, 8:06:20 PM



Hey, B

How are y

Explore Features



Book Search

Ask Libby to help you find books from our library collection.

Start Chat

Notifications

CLEAR ALL

Book Available

1984 is now available!

12/13/2025, 8:34:37 PM

Book Available

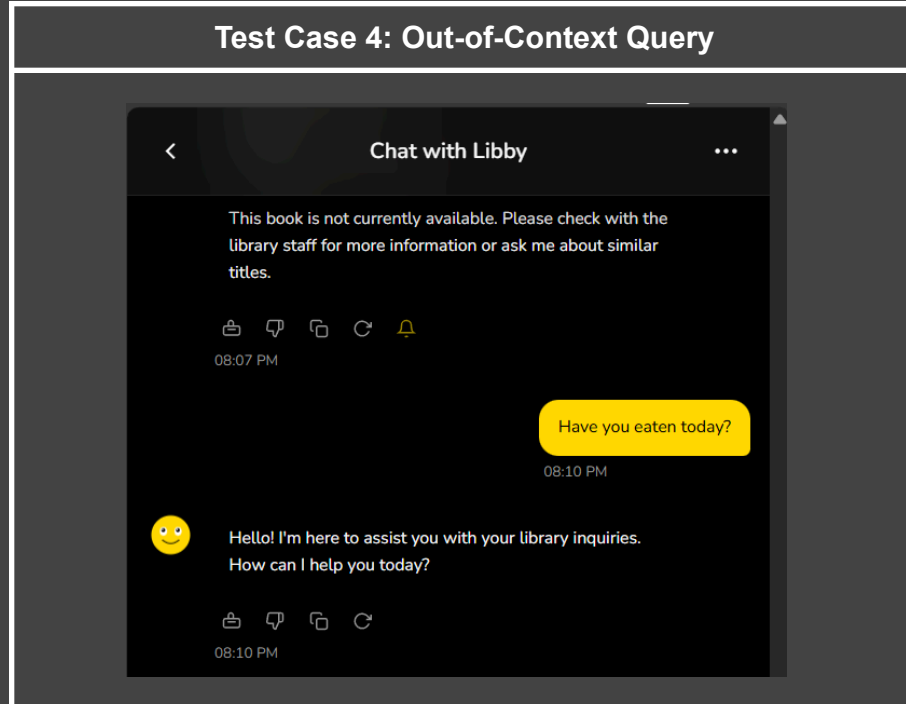
1984 is now available!

12/13/2025, 8:33:45 PM

Book Available

Dune is now available!

12/13/2025, 8:31:28 PM



Ethics and Security

The system is designed to promote ethical and responsible use of technology, particularly in its application of artificial intelligence. The AI component functions strictly as a support tool for library-related inquiries and does not make independent decisions. Critical actions such as book borrowing and reservation approvals are handled by human administrators, ensuring accountability, transparency, and proper oversight. This human-in-the-loop approach prevents misuse and reinforces trust in the system.

In terms of security and privacy, the system follows the principle of data minimization and complies with the Data Privacy Act of 2012 (RA 10173). All communications are secured through HTTPS encryption, and access to system resources is controlled using authentication and role-based authorization. Backend data stored in Firebase Firestore is protected by authentication rules that restrict unauthorized access. Regular monitoring and audits further help mitigate risks, ensuring that user data and system operations remain secure and reliable.

Conclusion and Future Enhancement

Conclusion

The UBLC Library Assistant - Libby represents a significant step forward in modernizing library services at the University of Batangas Lipa Campus. By leveraging AI technology and automation, the system provides an intuitive, accessible, and efficient way for students and staff to interact with library resources and services.

Through the integration of departmental datasets from the Library, Libby offers comprehensive assistance that goes beyond traditional library services. The modern glass morphism UI design, combined with an interactive mascot, creates an engaging user experience that encourages frequent use and enhances user satisfaction.

The project demonstrates the potential of AI automation in educational institutions, streamlining operations while improving accessibility and user experience. With a robust CI/CD pipeline and scalable architecture, the system is well-positioned for future growth and enhancement.

Future Enhancement

- **Advanced NLP Capabilities:** Implement more sophisticated natural language understanding for complex queries
- **Multi-language Support:** Add support for multiple languages to serve a diverse user base
- **Sentiment Analysis:** Analyze user feedback and queries to improve service quality
- **Predictive Analytics:** Predict user needs and proactively suggest resources
- **Voice Interface:** Add voice input/output capabilities for hands-free interaction