



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

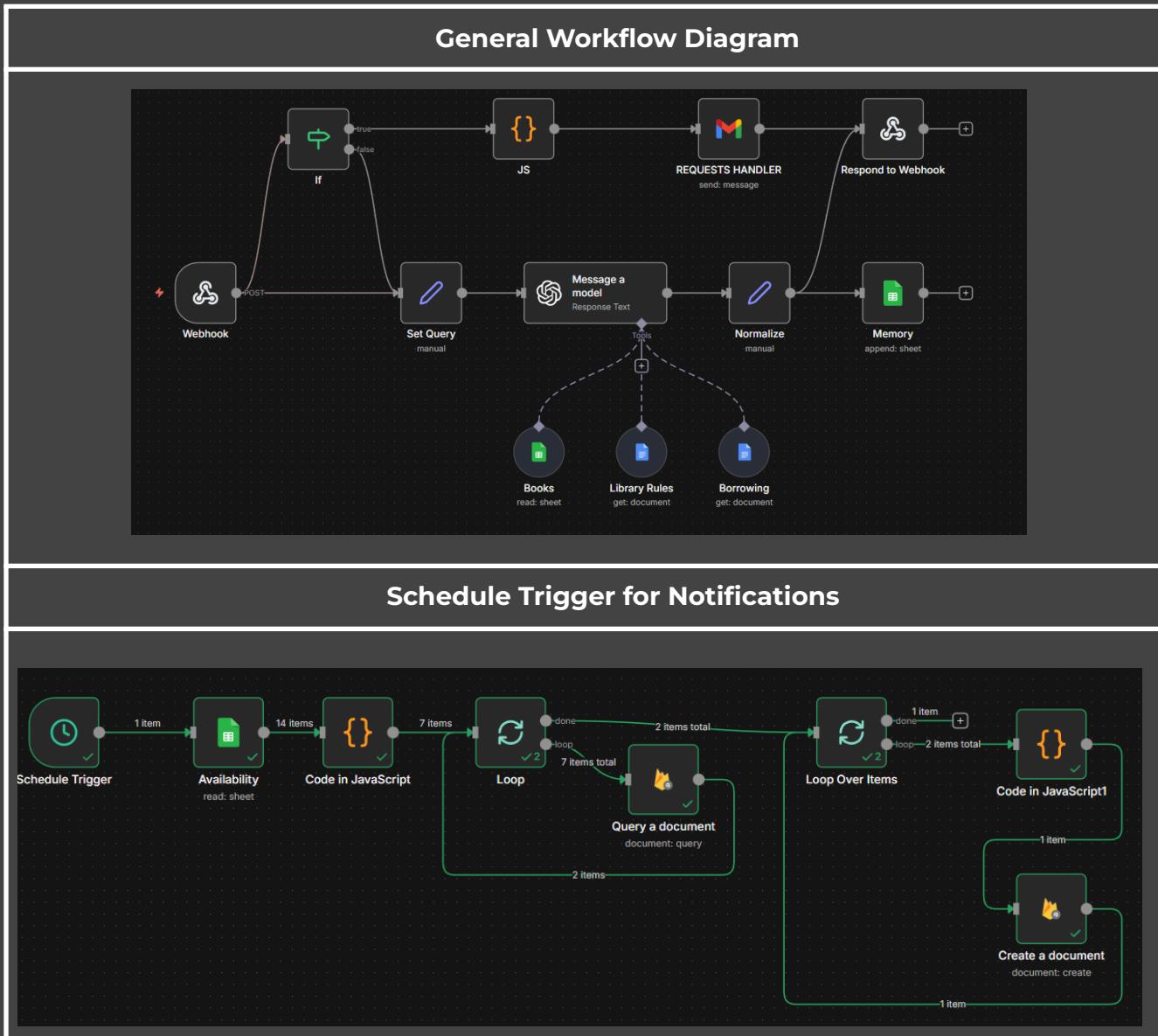
- Deploy an AI-powered chatbot for real-time library inquiries.
- Automate book search and availability checking via integrated datasets.
- Provide a responsive interface across mobile and desktop devices.
- Implement secure backend workflows through n8n automation.
- Generate basic usage analytics for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



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
e.g., 2220777

Password
Enter password

Login

No account? [Register here](#)

Welcome, I'm Libby!

Sign in or create an account

Login **Register**

Full Name
e.g., Juan Dela Cruz

Year Level
e.g., BSIT - 4th Year

Student Number
e.g., 2220777

Password
Create password

Create Account

Already have an account? [Login](#)

Onboarding Page



Hey! I'm Libby!

Your friendly library assistant at University of Batangas Lipa Campus.

Continue

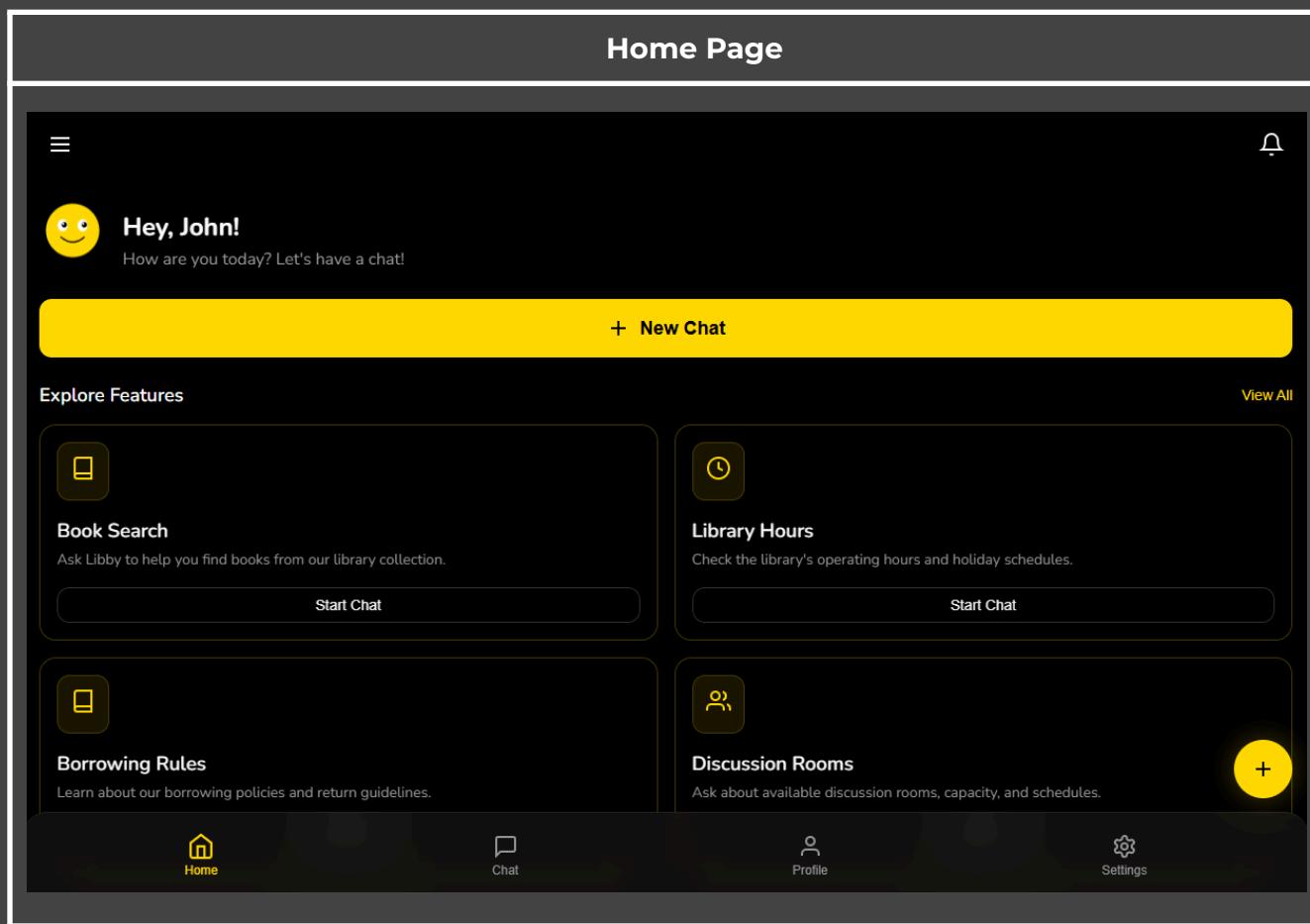


Get Instant Help

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

Get Started

Home Page

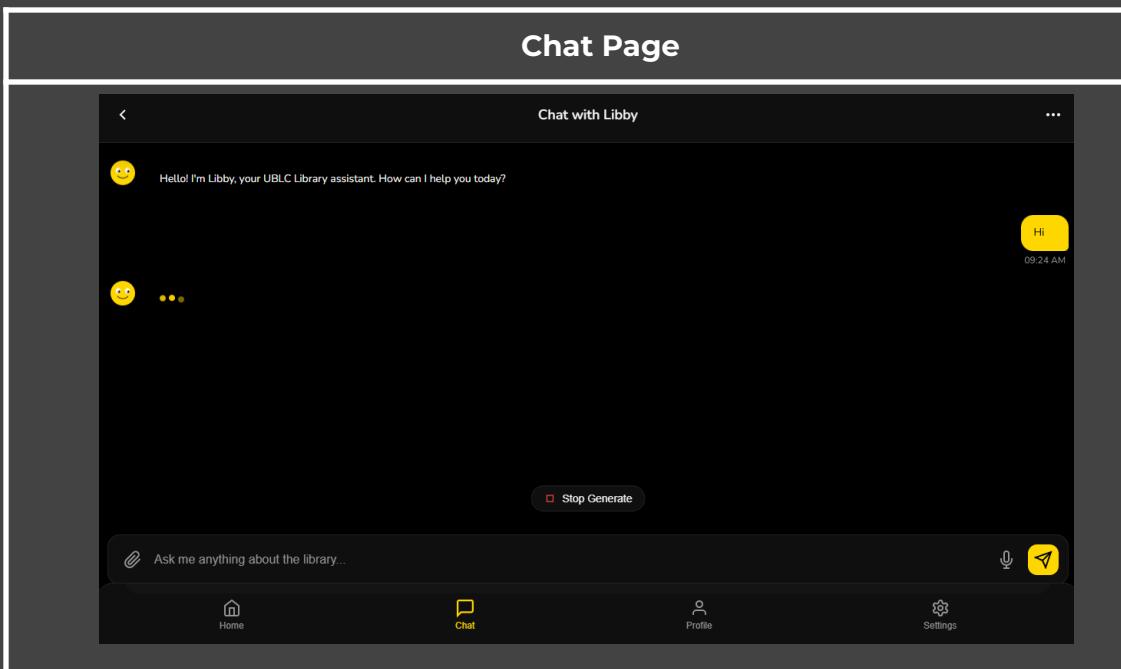


The Home Page features a dark-themed interface with yellow highlights. At the top right is a bell icon with a notification count of 3. On the left is a menu icon (three horizontal lines). The main area starts with a greeting from a yellow smiley face icon: "Hey, John! How are you today? Let's have a chat!". Below this is a yellow button with a plus sign and the text "New Chat". A section titled "Explore Features" contains four cards:

- Book Search**: Ask Libby to help you find books from our library collection. Includes a "Start Chat" button.
- Library Hours**: Check the library's operating hours and holiday schedules. Includes a "Start Chat" button.
- Borrowing Rules**: Learn about our borrowing policies and return guidelines.
- Discussion Rooms**: Ask about available discussion rooms, capacity, and schedules. Includes a "Start Chat" button.

At the bottom are navigation icons for Home, Chat, Profile, and Settings, along with a yellow circular "Add" button.

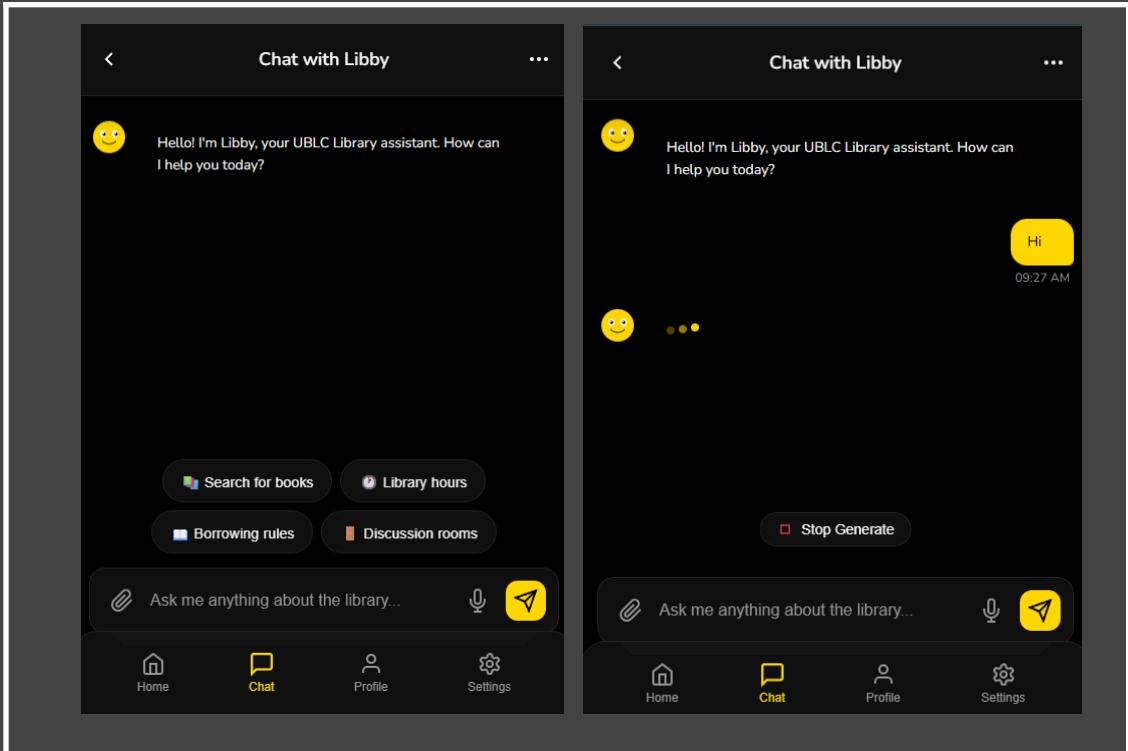
Chat Page



The Chat Page shows a conversation with a yellow smiley face icon named "Libby". The messages are as follows:

- Libby: Hello! I'm Libby, your UBLC Library assistant. How can I help you today?
- User: ...
- Libby: Hi! 09:24 AM

Below the messages is a "Stop Generate" button. At the bottom is a text input field with a microphone icon and placeholder text "Ask me anything about the library...", along with a send icon. Navigation icons for Home, Chat, Profile, and Settings are at the very bottom.



Profile and Settings Page

This screenshot shows the "Profile and Settings Page" of the application.

Profile Section:

- User icon: A yellow-outlined circular profile icon.
- Name: John Rico Tolentino
- Email: 2220777@ublc-student.local
- Email: 2220777@ublc-student.local
- Statistics: Books Borrowed (0), Due Returns (0), Reserved Books (0).
- Links: Borrowed Books, My Requests, Favorites.

Settings Section:

- Settings Header:** Settings
- PREFERENCES:**
 - Notifications: On (yellow switch)
 - Dark Mode: On (yellow switch)
 - Language: English (dropdown arrow)
- SUPPORT:**
 - Help Center
 - Privacy Policy
 - About UBLC Library

Bottom right corner: UBLC Library Assistant

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	ZGlycV9coWUBuFkndItOYU0...
2340123@ublc-studen...	✉️	Dec 12, 2025	Dec 12, 2025	FQYpSN2hGDaeZgSfm90qOl...
2220222@ublc-studen...	✉️	Dec 12, 2025	Dec 13, 2025	6NiuZPrAKOaRBZMCiniaMWjT...

Rows per page: 50 ▾ 1 – 4 of 4 < >

Firestore Database

The screenshot shows the Google Cloud Platform Firestore Database interface. At the top, there's a navigation bar with 'ChatLibby' and 'Cloud Firestore > Database'. Below it, a toolbar has tabs for 'Data' (which is selected), 'Rules', 'Indexes', 'Disaster Recovery', 'Usage', and 'Extensions'. A search bar says 'Ask Gemini about the core concepts to use Firestore'. A modal window is open at the bottom, titled 'Protect your Cloud Firestore resources from abuse, such as billing fraud or phishing' with a 'Configure App Check' button. The main area shows a hierarchical view of documents under the 'users' collection. One document for user '6NiuZPrAKOaRBZMCiniaMWjTeQK2' is expanded, showing a 'notifications' sub-collection. One document in 'notifications' is selected, showing fields like 'bookTitle: "C++ Programming"', 'createdAt: December 13, 2025 at 3:56:25 PM UTC+8', 'message: "C++ Programming is now available!"', and 'title: "Book Available"'. There are also buttons for '+ Start collection', '+ Add document', '+ Start collection', and '+ Add field'.

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 1: Simple Query

The screenshot shows a mobile application interface for 'Chat with Libby'. At the top, it says 'Chat with Libby' with a back arrow and three dots on the right. A yellow message bubble contains the text 'Tell me about the borrowing rules' at 08:15 PM. Below this, a bot icon (yellow smiley face) responds with: 'The borrowing rules and procedures at UBLC Library are as follows:' followed by a list of steps. The steps are: '### How to Borrow Books', 'Step 1: Find Your Book', 'Step 2: Check Availability', and 'Step 3: Proceed to Checkout'. Each step has a corresponding list of actions. At the bottom, there's a text input field 'Ask me anything about the library...' with a microphone icon and a yellow send button. Below the input field are navigation icons for Home, Chat (highlighted in yellow), Profile, and Settings.

Chat with Libby

Tell me about the borrowing rules

08:15 PM

The borrowing rules and procedures at UBLC Library are as follows:

How to Borrow Books

Step 1: Find Your Book

- Use the library catalog (online or at the desk)
- Search by title, author, or subject
- Check availability status

Step 2: Check Availability

- Available: Book is ready to borrow
- Checked Out: Book is currently borrowed
- Reference Only: Must be used in the library
- On Hold: Reserved by another patron

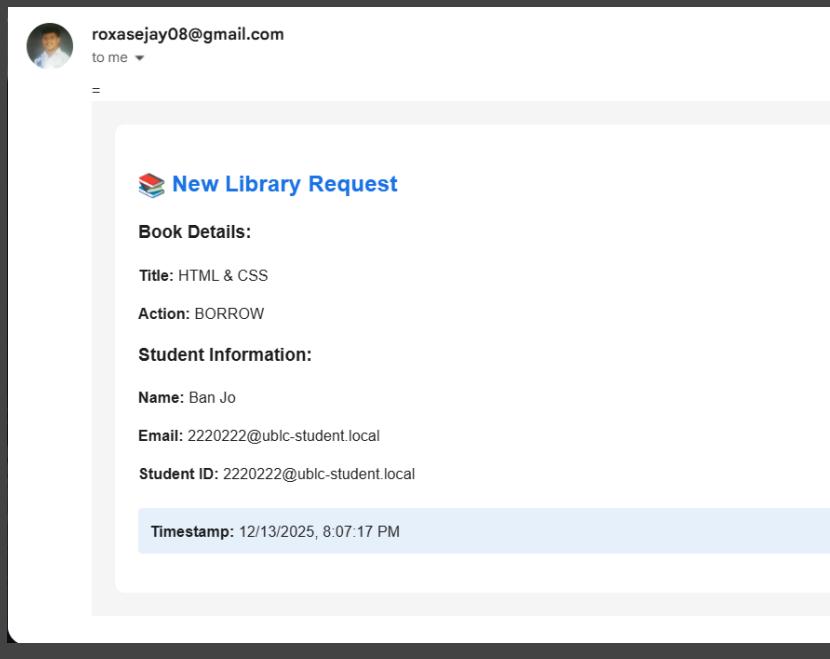
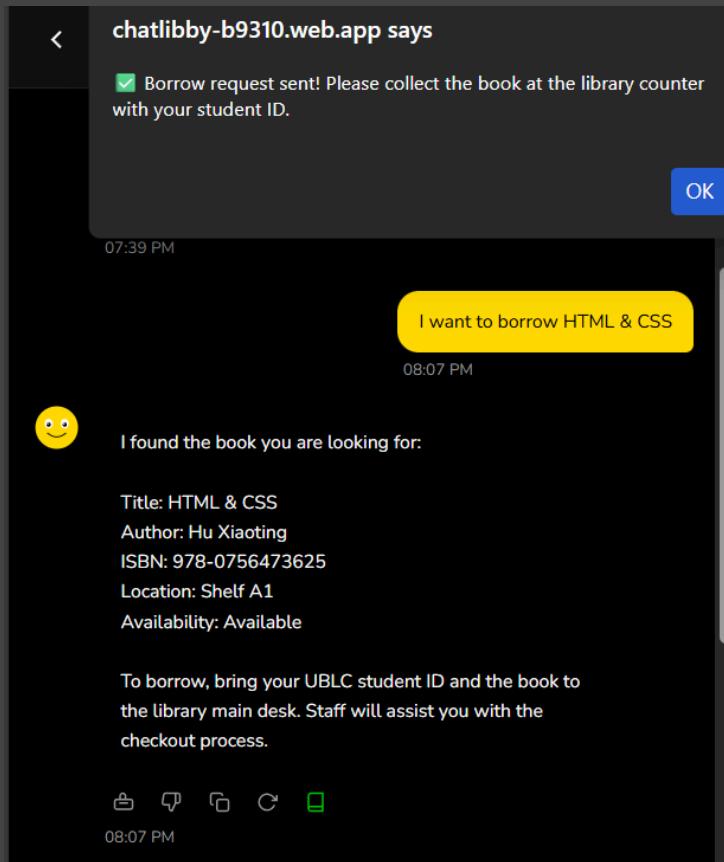
Step 3: Proceed to Checkout

- Bring your UBLC student ID
- Present the book to library staff at the main desk
- Staff will scan and process the checkout
- Receive your receipt with due date

Ask me anything about the library...

Home Chat Profile Settings

Test Case 2: Book Borrowing Request



Test Case 3: Book Reservation Request

chatlibby-b9310.web.app says

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

OK

07:59 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

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

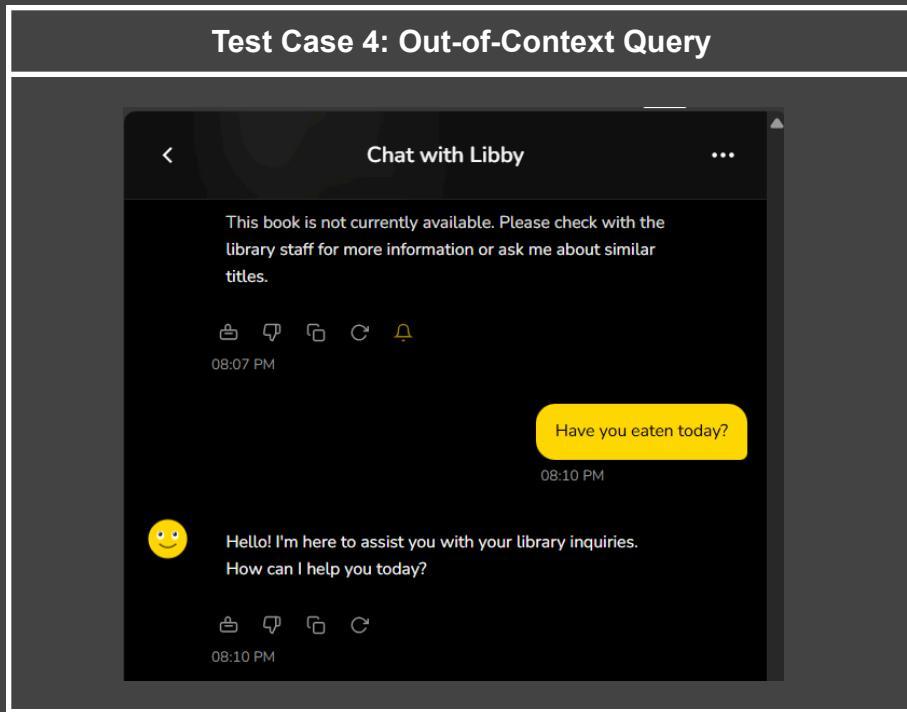
Explore Features



Book Search

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

Start Chat



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