Original Article

BORROW BOOKSY: An AI Powered Community-Based Book Sharing Application

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Abstract - Access to physical books within residential communities and small-scale libraries is often constrained by manual coordination, fragmented record maintenance, and limited digital visibility. This paper presents BORROW BOOKSY, a community-based mobile application designed to support peer-to-peer book sharing among residents of gated communities while simultaneously providing digital access to library-maintained book records. The system enables users to list owned books, browse community and library collections, and directly coordinate borrowing through a monitored workflow. Administrative oversight is enforced through a two-level structure consisting of a system-level super administrator and community-level managerial administrators. Additionally, AI-assisted book scanning is integrated to extract bibliographic metadata and assist in the preliminary identification of potentially sensitive content during book uploads. The application was pilot tested under a controlled environment as part of an Industrial Research Park (IRP) initiative, demonstrating improved accessibility, transparency, and efficiency in community-based book sharing and library information access.

Keywords - Community Book Sharing, Digital Library Access, Flutter, Firebase, Cloudinary, AI-Assisted Book Scanning.

I. Introduction

Even while digital libraries and internet reading platforms have become more popular, physical book access in gated communities and tiny local libraries remains chaotic. The majority of the current book-sharing practices rely on manual coordination, informal communication, and fragmented record-keeping. As a result, book availability is unclear, borrowing history is poorly managed, and administrators are unable to observe community-level circulation.

While several mobile and online platforms allow for the exchange of books, most focus on centralized libraries, open public sharing, or commercial resale. The regulated setting of gated communities, where accountability, trust, and administrative supervision are essential, is not addressed by these platforms.

Furthermore, current systems rarely incorporate privacy-preserving communication techniques or content moderation for peer-to-peer sharing [8].

In order to fill the research gap, this study suggests BORROW BOOKSY, a community-focused mobile application that blends digital library visibility with controlled peer-to-peer book sharing[9]. The system uses permission-controlled data exchange, role-based administration, and AI-assisted content screening to provide secure and transparent transactions. This endeavor aims to develop, implement, and evaluate a scalable platform that protects user privacy and accountability while improving book accessibility in residential communities.

By facilitating community-based book sharing and offering digital awareness of library book holdings, BORROW BOOKSY is offered as a unified mobile application that tackles these issues. Through regulated and monitored interactions, the application seeks to advance resource utilization, transparency, and community engagement.

1.1. Research Question and Scope

This project examines the question: How can a regulated, community-oriented mobile application enhance the accessibility, transparency, and accountability of physical book sharing while safeguarding user privacy and content security?

This study's focus is restricted to small community libraries and gated residential neighborhoods. Workflow management, AI-assisted moderation, role-based access control, and system architecture are the main areas of attention. This study does not cover commercial book-selling platforms or large-scale public marketplaces[13].

2. Problem Statement

At the moment, neighborhood book sharing and small local libraries rely too heavily on antiquated methods. To stay on top of things, they juggle dispersed chat apps, physical notebooks, and word-of-mouth promises. What is truly available is hidden by that patchwork setup. People in charge of it cannot truly know what they have or how well it is doing without a single, unambiguous system for monitoring which books belong to whom. They guess they work a lot. No one can pinpoint the precise time or cause of an item's disappearance when it disappears completely [3].

As a result, consumers find it difficult to use shared collections of books due to cumbersome methods. As a result, fewer people participate, which results in the underutilization of valuable knowledge. Many people simply give up because it takes too much work to find and request books. Even wealthy libraries eventually become quiet when access becomes a hassle. Developing tools based on how actual communities function is necessary to address deeply ingrained issues. Opening opportunities for everyone is more important than simply digitizing activities like sorting titles or logging. Effective design increases awareness, facilitates handoffs, and gradually fosters collective trust. Ideas can flow freely through clear channels without being slowed down by gatekeepers.

3. Proposed System

In housing neighborhoods, one app facilitates the sharing of items. It allows neighbors to give books to one another directly. They can also view what books are available at neighboring neighborhood reading establishments. Some enjoy exchanging stories in person, across hallways or driveways, and exchanging novels. Some choose to stay inside and tap screens rather than go outside. The entire procedure takes place on a phone screen. There is only one location where everything takes place.

When locals choose to exchange books with others in their community, they end up online. A message requesting to borrow one is sent out when someone finds one they want. Approval makes communication between the two parties possible. Admins keep things running smoothly while keeping a silent eye on things. Every stage of the handoff is recorded in the app, even when it takes place in person.

Local library holdings are still listed in the app by authorized team members. It is no longer required to show up only to check stock because access is done live online, and anyone can search up titles whenever they want. This makes it easier to obtain details and makes it easier to see what is available around the region.
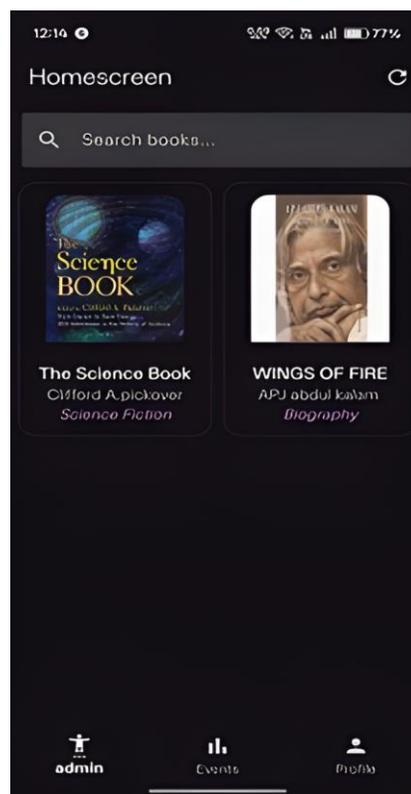

Fig. 1 Homepage

4. Methodology

This project was developed utilizing an iterative approach to problem-solving, with an emphasis on automated content moderation, community trust, and security.

4.1. Identification and Pivot of the Problem

The project's initial goal was to make general item sharing within a township easier. But for high-value products, a risk assessment showed a significant likelihood of theft or non-return. Two criteria were used to reduce the scope in order to lessen this:

Asset Value

Selecting goods that are highly useful yet less expensive to replace (books).

Environment

Limiting the user base to gated communities, where administrators serve as a backup level of accountability.

4.2. Privacy Design & Security Framework

A comparative analysis of current book-sharing services revealed a common problem: the early disclosure of private information (phone numbers and addresses). A Permission-Based Exchange architecture was used to address this:

4.2.1. Data Masking
By default, user information is kept secret.

Request-Approval Workflow
To ensure a "double-blind" privacy layer, contact details are only made public when the book owner digitally approves a request.

4.3. AI-Powered Content Control
The artificial intelligence component serves as a helpful tool when the book is being uploaded. Bibliographic information, including title keywords, is extracted using optical text recognition techniques when a user uploads an image of a book. The user can still edit the automatically filled-in extracted data. Additionally, basic image-based and natural language screening is done to find content that might be restricted or sensitive. By highlighting uploads that need to be manually reviewed, the AI output helps administrators rather than enforcing final choices. With this hybrid technique, automatic bias is avoided while moderation accuracy is guaranteed [2].

4.4. Platform Development and Selection
To decide between a mobile and web platform, a user preference analysis was carried out. A mobile application was chosen as the solution. Justification: Mobile applications provide superior "push notification" capabilities for real-time request alerts compared to websites, and smartphone usage in gated communities is close to 100% [8].
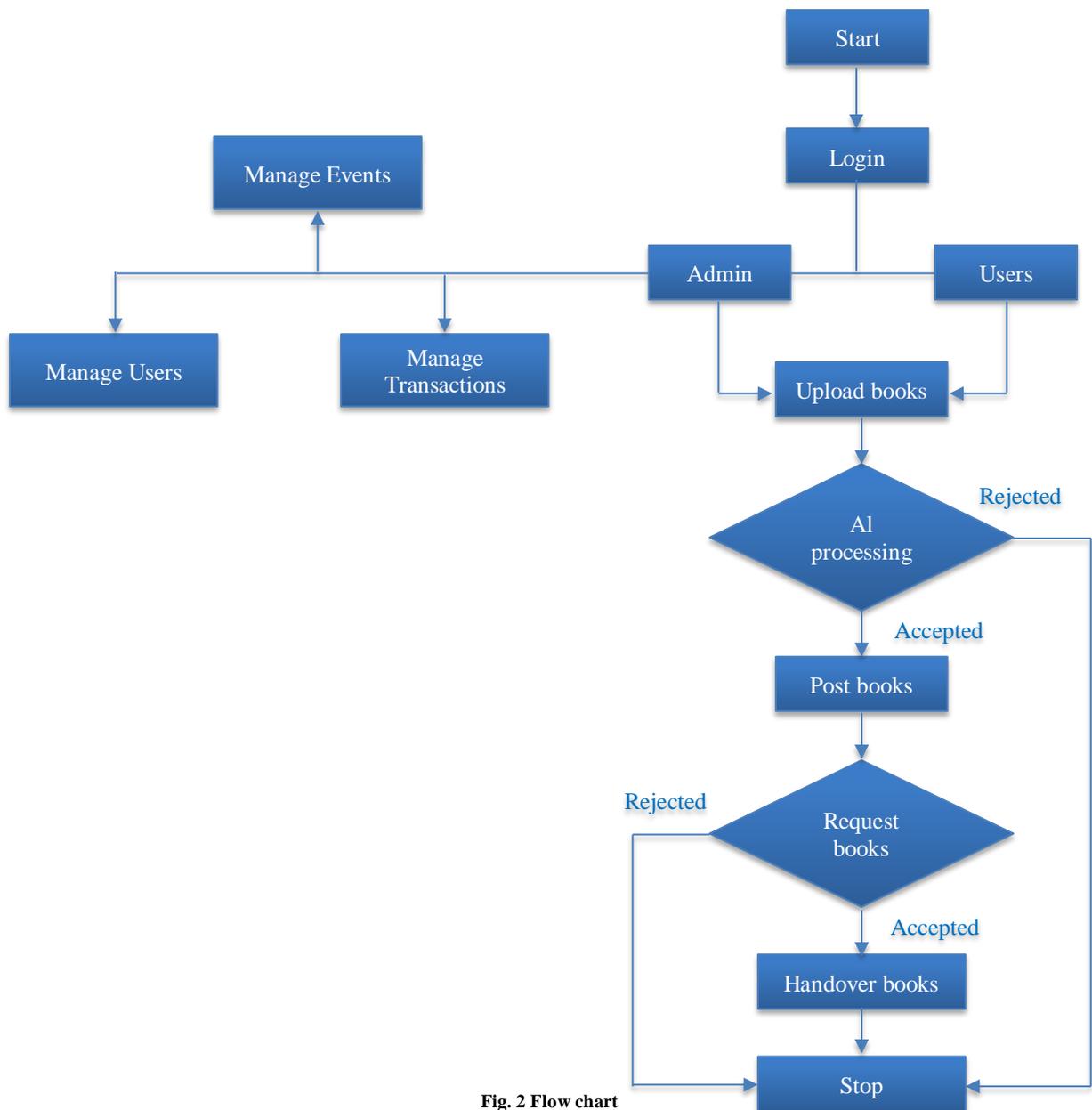

Fig. 2 Flow chart

5. Flow Chart

Access starts at the top with a validated sign-in that arranges users according to their status: Regular User or Admin. What appears once inside is entirely dependent on the initial label associated with the account. From here, options divide without overlapping. If the user selects the Admin option, they will be presented with tools for managing accounts, records, and local events. The others immediately begin borrowing books and participating in group reading activities. Every subsequent move is silently, yet fully, shaped by that initial checkpoint. From that one initial step, the entire shape of use emerges subtly.

The Book Circulation Pipeline, which incorporates sophisticated automated verification, serves as the application's main operational framework. The system instantly starts an AI processing stage when a user or an administrator starts the "Upload books" sequence [16]. The uploaded content is examined for data accuracy and moderation compliance in this crucial decision diamond. In order to avoid system clutter, the flow is routed to a terminal "stop" state if the material is marked as improper or fails processing. On the other hand, "accepted" information advances to the "Post books" stage, when it is made public and changes from a private asset to a community resource.

The Peer-to-Peer Transactional Cycle, which regulates the actual movement of physical books, is the subject of the workflow's last step. After a book is successfully posted, it moves into the "Request books" stage, where prospective borrowers can indicate their interest. This stage serves as an additional decision point; if a request is denied, the particular transaction is terminated, and if it is approved, it moves on to the "Handover books" phase [7]. This handover signifies the effective completion of the physical fulfillment of the digital request. From the first AI-assisted upload to the last physical exchange, BORROW BOOKSY makes sure that every transaction is tracked, moderated, and completed in an orderly, transparent manner by mapping these interactions through a structured flow.

6. Administrative Structure

The Super Administrator oversees the basic configuration, keeps the database operational, and controls the data flow across groups. Only these users can manage safety checks or change large-scale settings since system stability comes first. They are also in charge of conducting upgrades and incorporating new housing zones into the network. Oversight includes keeping an eye on activity records, limiting access, and making sure that all sections follow the same set of rules. They can facilitate growth without compromising security layers thanks to broad permissions. Here, ownership entails directing infrastructure decisions that have an impact on all connected communities. Security standards don't change because key decisions are made from one central

location. Maintenance includes monitoring subscriptions, modifying performance, and responding to threats. Even as new places join, their presence keeps things running smoothly[9].
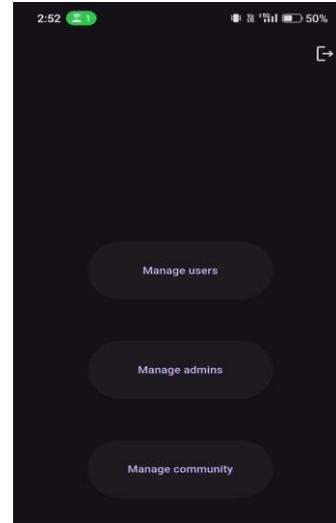

Fig. 3 Super admin page for centralized management

The Community Administrator, who is shaped by what each particular community or library outpost actually needs, is hidden beneath that global arrangement. Not far above the ground, these individuals oversee daily activities and strictly regulate who is permitted to do what in their domain. First, they have to confirm the neighbors. Next, they have to oversee the daily flow of books while following the rules. From there, messages spread among them; they issue warnings, resolve disputes about borrowed titles, and even schedule events in the area. This kind of localized power allows groups to manage themselves while remaining protected by the top-level admin's control over the system's overall structure.
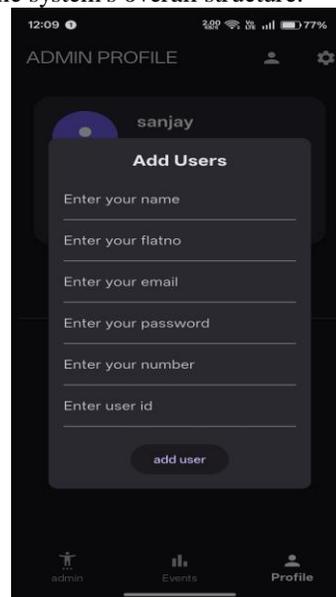

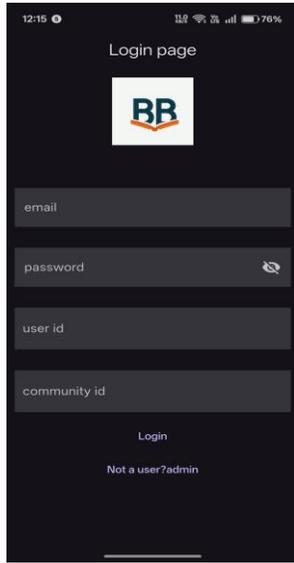**Fig. 4 Adding users from Admin Profile**

7. System Architecture

Fig. 5 Login Page

The BORROW BOOKSY configuration operates on a split but connected architecture, with client components communicating with server components in intelligent blocks. It features live-updating graphics that seem natural on Android devices because it was built with Flutter up front [9]. As a result, tapping and scrolling remain fluid even when screens differ or phones are not the newest models, which is crucial for homes with outdated technology. Firebase Authentication silently intervenes during login, securing sessions and locking down credentials. Upgrades to buttons or layouts will not interfere with what is happening behind the scenes, because appearances are managed independently of how things function underneath.
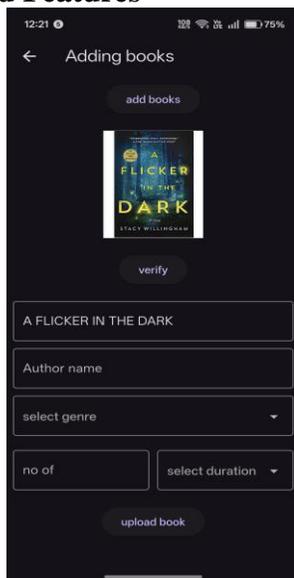
8. AI-Assisted Features

Fig. 6 AI image Processing

Artificial intelligence plays a supporting role at BORROW BOOKSY. When a photo of a book is uploaded, intelligent tools scan it and extract information such as the title into the form. That data appears ready to use, but it is still modifiable if necessary. Simultaneously, some words are marked early on in case they need to be reviewed later. Before anything sticks, real people always verify what the algorithm recommends[14].

9. Event Information Module

The app has a news-sharing feature that is managed by local administrators. Managing programs like reading campaigns? This is where they are posted. There are also book fairs along the street. Changes to the library take effect immediately. There are occasional updates about writer gatherings. What is shared is visible to everyone behind the gates. People stay engaged when they see these parts. Fast-moving details pique interest. Through these notes, a reading habit silently grows.
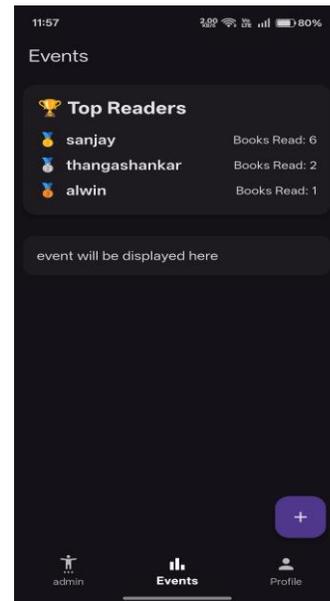

Fig. 7 Event page

10. Ethical and Privacy Consideration

Data security and user privacy were important design factors. By default, personal data is hidden and only disclosed with the user's permission upon request acceptance. To reduce bias and misclassification, all AI-assisted operations are supervised by humans. For accountability and transparency, the system logs every interaction and does not retain extraneous personal information.

11. Conclusion and Future Scope

BORROW BOOKSY is more than simply an app. It transforms the way communities exchange books by seamlessly fusing traditional practices with modern technology. Strong cloud support complements a seamless

Android experience, and intelligent automation takes care of the monotonous tasks without any hassle. People receive clear guidelines and real-time information in place of paper logs and guessing, which makes sharing more equitable for everyone in the vicinity. What once sat on shelves is now free to move, transforming peaceful libraries into vibrant marketplaces where books are shared and relationships are formed. The outcome? More than just storage. Something dynamic, adaptable, and molded by its daily users.

BORROW BOOKSY is moving past its current model one step at a time. Smarter tools are on the horizon, such as suggestion systems based on user preferences, rather than only fundamental features. These adjustments are based on individual preferences, making it easier to find books. Forecasting panels that show which titles move quickly and where habits change give administrators even more insight. Smart updates keep things going smoothly in the background while expansion expands into new communities. The model adjusts without losing equilibrium thanks to ongoing minor modifications in community design and technology. Over time, this subtle advancement influences how online shared resources can function—not ostentatious, simply more effective.

Acknowledgment

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