Project and Professionalism (6CS007)

Final Year Proposal

GharBhada: Rental Management Platform

Full Name: Krishma Shrestha

Student Number: 2431161

Course: Project and Professionalism (6CS007)

University Email Address: K.Shrestha32@wlv.ac.uk

Supervisor: Siddhartha Thapa

Reader: Durga Pokharel

Date of Submission: 11/22/2025

Abstract

Abstract GharBhada is a complete digital rental management platform to modernize and streamline Nepal's rental housing landscape. GharBhada comprises a digital ecosystem for rental housing that far exceeds mere property listings by unifying property exploration, intelligent search, booking management, digital agreements, automated rent and utility payments, unresolved complaint tracking, notifications, and tracking by administrators all in one place. By enabling preventive methods for trust scoring, and fraud detection to assist in addressing a long history of inefficiency, disputes, and lack of transparency in the Nepali rental market, this project employs the latest technology stack (React.js, Node.js, MySQL), and has integrated eSewa, Khalti, and local payment modes. GharBhada aims to ensure access, privacy, and real-time functions. Our project uses Kanban to quickly take iterative changes to put into practice, while continuing to put all users at the centre of our improvement and user experience (UX) and user interface (UI). Overall, GharBhada enhances the rental process into an efficient ecosystem that transparently builds trust and accountability among tenants, property owners, and administrators.

Acknowledgment

Table of Contents

Table of Figures

Table of Tables

1. Background

The rapid urbanization of Nepal, especially in the Kathmandu Metropolitan Region, has dramatically increased the demand for rental housing. Rentals have been traditionally done manually using brokers, word-of-mouth, and often missing listings, resulting in inefficiencies, fraud, and disputes over deposits or rent payments. Astoundingly, tenants regularly deal with unverified listings of properties, and ambiguous agreements, and have to manually remember to note the neighbors' utility bill (and sometimes are left scrambling for the payment to the landlord). Landlords often express their frustration with slow payments, meet with distrust of tenants, and feel administratively chaotic.

Some general digital marketplaces, such as Lal Purja Nepal or Hamro Bazar, are beginning to provide platforms with listings. However, they do not fully provide a rental management solution. Further away, companies with similar platforms, such Zillow (USA) and Housing.com (India) are improving property search and management; however, they are still struggling to integrate contracts, payments, and utilities. GharBhada products gap by providing a platform to fill this gap in the context of Nepal. Specifically, GharBhada aims to digitize the rental life-cycle. Beginning with the property search and verification, booking, making a digital agreement, automatically paying rent and utilities (not cut-off due to a dispute), complaint management, and reporting. This includes detailed features such as trust scoring, and fraud, as well as integration of local payment gateways (including eSewa and Khalti). GharBhada helps tenants, landlords, and administrators conduct rental transactions in a transparent, secure and efficient way, while adding necessary features to improve the rental ecosystem in a more accountable manner, clearly benefiting all participants.

2. Project Briefing

GharBhada is a web-based rental management platform designed to digitize and streamline the rental process in Nepal. The system serves three primary user roles: tenants, property owners, and administrators, offering end-to-end rental management from property discovery to dispute resolution.

Tenants can register, browse and filter properties using advanced search options, view details such as property type, rent, deposit, and owner trust scores, book properties, sign digital agreements, pay rent and utilities online via local payment gateways (eSewa, Khalti), and raise complaints or maintenance requests.

Owners can create detailed property listings, manage booking requests, approve or reject tenants, negotiate lease terms, receive automated payments, monitor rental and utility transactions, and manage renewals or terminations.

Administrators oversee platform operations by verifying users and property listings, monitoring transactions, resolving escalated disputes, generating reports, and ensuring transparency and security.

GharBhada also integrates features such as automated billing calculations, real-time notifications, AI-driven recommendations, and trust scoring to foster accountability and reduce fraud. By unifying search, booking, agreements, payments, and complaint handling, the platform creates a secure, efficient, and transparent rental ecosystem tailored to the Nepali housing market.

3. Aim

To create an inclusive, secure, scalable user-centric digital rental management platform custom to Nepal, that encompasses the entire rental process from property listings, intelligent search, booking, digital agreements, automated rent and utilities payments, lodging and managing complaints, management tools, all to provide increased transparency, trust and efficient processes for tenants, property owners, and management.

4. Objectives

- Implement role-based user registration and authentication for three primary roles: Tenant, Owner, and Admin.
- Enable property owners to create and manage listings with detailed attributes, including rent, deposit, type, photos, and amenities.
- Provide tenants with advanced search and filtering tools to discover properties based on location, rent, type, and features, along with booking request functionality.
- Develop a digital rental agreement system with customizable lease terms and e-signature support.
- Automate rent and utility payments (electricity per unit, water, and fixed garbage fees) with reminders, receipts, and reporting.
- Build a complaint and maintenance tracking system that allows tenants to report issues and track resolution, with owner and admin intervention when needed.
- Create role-specific dashboards for tenants, owners, and admins featuring analytics, progress monitoring, and system reports.
- Integrate features that enhance transparency, trust, and efficiency across all rental operations.

5. Academic Questions

a. How can a digital rental platform enhance transparency, trust, and accountability in Nepal's housing market?

b. To what extent do integrated features, such as automated payments, notifications, digital agreements, and reporting, improve user engagement, efficiency, and satisfaction?

c. How do trust indicators, owner reliability scores, and administrative oversight influence user adoption and confidence in rental platforms?

d. How can a unified, user-centered platform contribute to long-term efficiency and reliability in the Nepali rental ecosystem?

6. Problem Statement

The rental housing environment in Nepal remains primarily analog and fragmented; entities like Lalpurja Nepal and HamroBazar offer limited capabilities for prospective tenants to simply view a property listing and search for usable functionalities. No vendors exist in Nepal that provide integrated end-to-end rental market services, such as digital agreements, automatic processing of rent and utility payments, complaints management, and accountability reporting. Prospective tenants are limited in verifying properties, the timing and efficiency of rent payments and how maintenance issues are resolved while landlords struggle with manual records, late payments, and disputes with tenants. The absence of a unified solution detracts from transparency, trust, and efficacy within rental transactions in Nepal. The demand is apparent for a comprehensive digital platform where property discovery, booking, contract management, rental transaction payments, and issues resolution can occur in one ecosystem spanning tenants, property owners, and administrators which is reliable and accountable to one another, and simple to manage.

7. Project as a Solution

GharBhada addresses the limitations of existing rental platforms in Nepal by offering a comprehensive, end-to-end digital ecosystem for property rentals. Unlike systems that only provide basic listings or isolated features, GharBhada integrates property discovery, booking, digital agreements, automated rent and utility payments, notifications, complaint tracking, and reporting into a single, user-friendly platform.

The system enhances transparency, trust, and efficiency by providing verified listings, secure e-signatures for agreements, and automated billing with reminders and receipts. Tenants, owners, and administrators can manage all aspects of the rental lifecycle in one place, reducing disputes, preventing fraud, and ensuring accountability.

By unifying these features, GharBhada not only provides immediate support but also fosters long-term benefits such as financial clarity, habit formation around responsible rental practices, and improved communication between stakeholders. This holistic approach transforms Nepal's rental process into a digitized, automated, and intelligent system, empowering users to navigate rentals efficiently and confidently while building trust and reliability throughout the rental ecosystem.

8. Scope and Limitations

8.1 Scope

- Development of a responsive web-based platform tailored for the Nepali rental market.

- User roles: Tenant, Owner, and Admin, with trust scoring and verification mechanisms.

- Property listings with detailed attributes such as rent, deposit (minimum NPR 5,000), type (1BHK, 2BHK), photos, and amenities.
- Advanced search and filtering tools for tenants, including map integration, AI-driven recommendations, and wish list features.
- Booking management with notifications, automated lease agreements, and e-signature support.
- Automated rent and utility billing (metered electricity/water per unit, fixed garbage fees) with reminders and reporting.
- Complaint and maintenance tracking with owner and admin oversight.

- Payment integration with Nepali gateways such as eSewa and Khalti.

- Dashboards and analytics for all roles to monitor activity, payments, complaints, and property performance.

8.2 Limitations

- The platform provides supportive digital tools only and does not replace legal advice; agreements are templates and may require independent review.

- Phase 1 focuses solely on a web-based platform; native mobile applications are not included.

- Accuracy of automated billing and complaints tracking depends on consistent user input.

- Advanced AI features such as rent prediction or fraud detection are limited to basic implementations and may require further data and training.

9. Functional Decomposition Diagram (FDD)
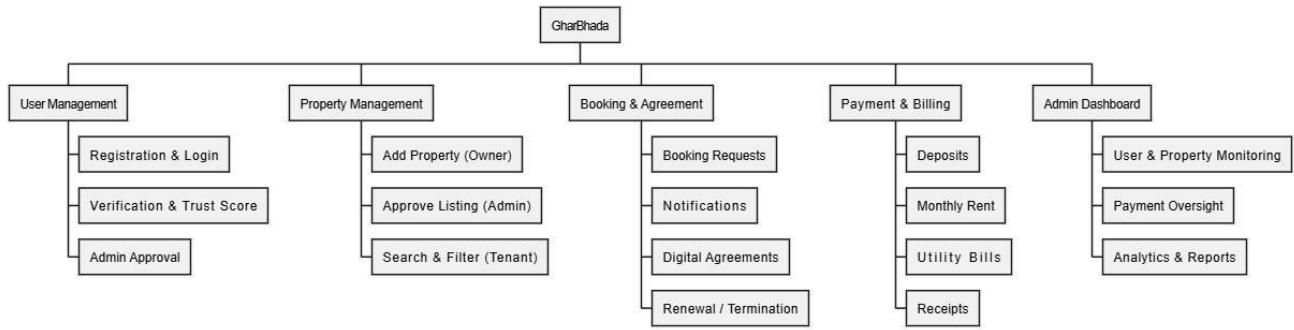
Figure 1:FDD Diagram of the GharBhada System

The diagram shows how GharBhada has created its hierarchical viewing of what GharBhada practitioners think about. Owning five core modules - User Management,

Property Management, Booking & Agreement, Payment & Billing, and Admin Dashboard - the primary module views are directly connected to their sub-function views module by module, for instance, the User Registration/Login, the Property Listing and Search, the Booking Request(s), and the Digital Agreements, as well as the Automated Payments and the Analytics. This diagram helps illustrate the workflow from tenants and owners to overall admins and offers a simple visual of how the function areas of this platform may be interrelated and managed.

10. Artifacts & Subsystems

GharBhada is a web-based rental management platform created to address housing transactions within Nepal. The complete system is broken down into several subsystems that correspond to a specific grouping of functions.

10.1 Subsystems

10.1.1. User Management System

Facilitates user sign-up, sign-in, and role-based access (Tenant, Owner, Admin). Key functions include profile management, authentication, determining trusted status based on user activity, and new accounts needing approval from Admin. Challenges include securing, and storing user passwords, and permission management.

10.1.2. Property Listing and Search

Allows landlords to create comprehensive property listings with rent, deposit (at least NPR 5,000), type (1BHK/2BHK), photos, amenities, and rules. Tenants can search property listings by location, price, type, and other variables and filter those listings. Features include a map, wishlist, and AI recommendations. Challenges include correct filtering and depicting search trends.

10.1.3. Booking and Notification System

The system is used to manage tenant booking requests, owner acceptances/rejections and timely notifications. Features include immediate booking via trusted users, autocancellation of other requests, and notifications via email or SMS. There are challenges surrounding tenant privacy and managing and controlling the requests.

10.1.4. Agreement and Contract Management

Creates digital rental contracts with configurable lease terms (1-5 years or custom) and esignatures. Contracts are securely stored in PDF format. Challenges include capturing the appropriate lease terms and document security.

10.1.5. Payment and Billing System

Processes deposits, monthly rent, and utilities (metered electricity/water, fixed garbage fees). Features include partial payments, automated invoice generation, reminders, the ability to integrate with Nepali payment gateways (eSewa, Khalti), and the ability to generate receipts. Early project challenges included integration and invoicing accuracy.

10.1.6. Admin Dashboard

Offers administrators the ability to monitor users, properties, payments, and analytics. There are approvals, depending on role, reports, and summary data for platform activity to be able to make informed decisions. The main challenge is to organize the data in a customer suitable and actionable format.

11. Literature Review

The literature indicates that digital platforms are becoming increasingly significant and effective for achieving transparency, efficiency and trust in rental housing. (Ferreri & Sanyal, 2021) reviewed digital rental platforms, demonstrating they mitigate risk through end user filtering and access control, thereby mitigating uncertainties traditionally addressed by brokers. They also noted risks of informalisation, while acknowledging a structured in-platform use of standardized digital contracts are effective tools. (Fields, 2019)noted that automation in housing markets increases financial accountability and efficiency. Equally, and importantly, the study underlined that user engagement is an essential component of success for digital systems and indicated that the user features of automated rental platforms would need to include notifications, reminders and clear interfaces. (Boeing, et al., 2023)reviewed the effects of online platforms that facilitate access to more information and thereby expand housing markets by changing the traditional practices of market exchanges. This indicates that GharBhada's primary functions of property listing and advanced search are the basis of an effective platform. (Xue, et al., 2021) considered the contributions of blockchain and smart contracts to rental systems in establishing trust between users, finding that tailored use of transparent digital agreements caused greater user trust and therefore increased level of engagement. This supports GharBhada implementation of digital agreements and trust-scoring capabilities. (Obse, 2025)examined online rental platforms for Ethiopia, finding that digital spaces facilitate scalability, transparency, and efficiency. This study further reinforces the feasibility for salient systems to be used in Nepal and suggests potential usability and ethical discussions to take place before implementation. Overall, these studies provide a strong basis for the design and functionality of GharBhada, support for the effectiveness of a comprehensive approach that combines listings, bookings, digital agreements, payments and trust in the rental process of Nepal. Overall, these studies provide a strong basis for the design and functionality of GharBhada, support for the effectiveness of a comprehensive approach that combines listings, bookings, digital agreements, payments and trust in the rental process of Nepal.

11.1 Subsystems

Globally and locally, there are various rental platforms, each focusing on and catering to areas of strength, however none offer a full end-user rental management system:

11.1.1. Zillow

Zillow offers property searches and listings using a simple guided interface. It provides searches and valuations but does not include payments, agreements, or complaints processing within its workflows. GharBhada provides additional benefits by combining listings with payments, utilities, agreements, and trust scoring.

11.1.2. Common Floor

Common Floor provides apartment listings and community tools. Although it is useful for searching for properties, it does not offer automated bill payment tracking. GharBhada includes those features, so you can have measurable reporting and end-to-end management of your rental.

11.1.3. Rent.com

Rent.com has a property search feature with filters but no payments, notifications, or agreement integration. GharBhada takes it one step further with booking workflows, digital agreements, and notifications to tenants and owners.

11.1.4. Airbnb (Long-Term Rentals)

Airbnb excludes bookings for short-term rentals but makes no pretense for utilities, complaints, or term or long-term agreements with any type of property owner. GharBhada combines all this: bookings, payments, agreements, and maintenance, to create a fullfledged system.

11.1.5. Comparison with Lalpurja Nepal

Lalpurja Nepal is a Nepal that displays property by listing properties and has basic search functionality; however, it does not have a full rental lifecycle. The table below highlights its features and compares it with GharBhada:

S.N.	Feature	Lalpurja Nepal	GharBhada
1.	User Registration & Authentication	Basic login/register	Role-based login with admin approval
2.	Property Discovery	Browse and filter listings	Enhanced filters with AI recommendations
3.	End-to-End Booking Flow	Not Supported	Browsing → Booking → Agreement → Payment
4.	Rent & Utility Payments	Not Supported	Automated billing with reminders and receipts
5.	Partial Payment Handling	Not Supported	Supports deposits, partial, and advance payments
6.	Dashboard & Analytics	Not Supported	Tenant, Owner, and Admin dashboards with reports
7.	Trusted Badge & Review System	Not Supported	Verified tenant/owner scoring system
8.	AI Enhancements	Not Supported	Rent prediction, property recommendations, chatbot
9.	Payment Gateway Integration	Not Supported	eSewa, Khalti, and bank integration

Table 1:Feature Comparison Between Lalpurja Nepal and GharBhada

Key Takeaway:

Unlike Lalpurja Nepal, which is primarily a property discovery platform, GharBhada is a complete rental ecosystem that digitizes and automates the entire rental experience for tenants, property owners and administrators in Nepal.

12. Chosen Methodology

As for this project, I have selected the Kanban methodology of Agile frameworks due to its elementary, flexibility, and very visual way to track work. A single-developer project is also a perfect fit for Kanban; there are no formal roles, meetings, or ceremonies needed for the structure of Scrum. As priority shifts, Kanban enables you to improve and conjoin directly, based on what work is going in relation to time, while at the same time continuously improving.

With a Kanban board, I can visualize my work, taking tasks from stages like To Do, In Progress, Code Review, and Done: at any moment looking at the board, I am able to see the status of my work. I also implement Work-in-Progress (WIP) limits, so that I don't end up doing too much. Constantly monitoring your work-in-progress and focusing on highquality outputs is much better! With little interruption, I can keep pushing tasks into the Kanban board to continue the workflow of tasks based on what is priority, and supervisor feedback. The continuous workflow allows me to pull work that fits the priority and substandard time needed. I benefit from that ability to pull intermediate work not only based on supervisor feedback, but also on a regular feedback loop. This benefit ensures that I am continuously improving my workflow in a way that is efficient.

To Do	In Progress	Code Review	Done
Task 1	Task 3	Task 4	Task 5
Task 2			
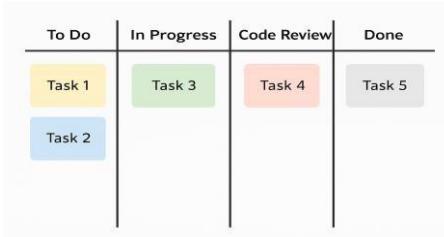
Figure 2:Kanban Board

12.1. Work Breakdown Structure (WBS)

I organized the project into a Work Breakdown Structure (WBS) to identify all phases and sub-tasks. Getting clear visibility into each of the components that make up

GharBhada helps me manage them appropriately and ensures that nothing gets missed.
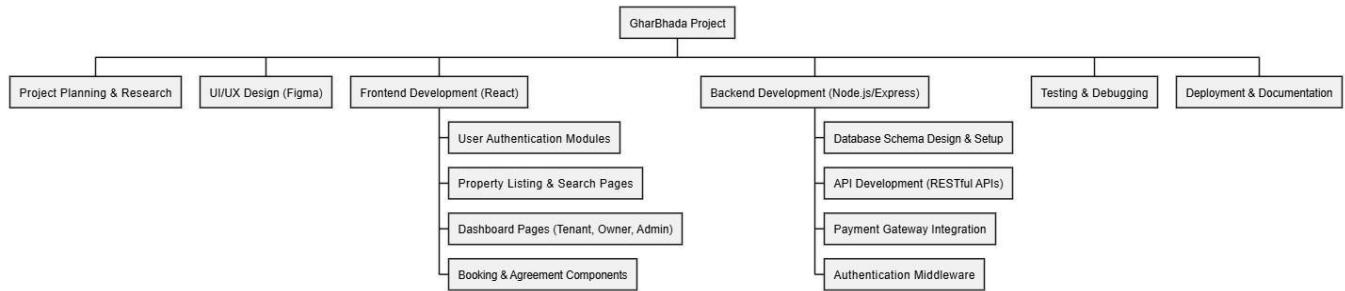

Figure 3:Work Breakdown Structure (WBS)

This hierarchical taxonomy allows me to monitor progress at both a high-level view or detailed consideration, making certain that all modules, from authentication through to payment integration, will be produced in a systematic way.

12.2. Gantt Chart

In order to monitor timelines, I made a Gantt Chart for both epic-level tasks and detailed tasks. This was a convenient means for me to look at the schedule and dependencies of the project.
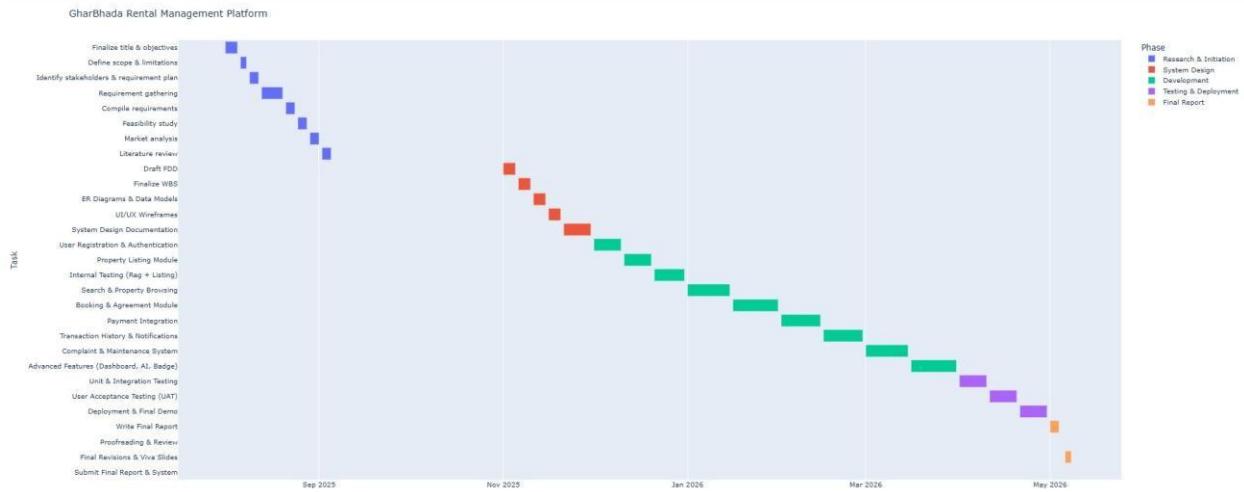

Figure 4:Detailed & Epic-wise Gantt Charts

The Gantt chart lets me see the overall progress by month so that I can make sure that the key deliverables like authentication, property listings, payment integration, and testing will be completed on time. I also maintain a more granular task level Gantt chart in Jira; this allows me to track progress in real time.

By combining Kanban, the WBS, and Gantt charts, I continue to have clarity in the project workflow, I can set priorities, and I can shift to accommodate changes. This approach paves the way for GharBhada to be developed iteratively and with a great deal of efficiency, allowing me to focus on developing new user-centered features.

13. Chosen Tools and Technologies

13.1. Programming Language – JavaScript

Javascript is chosen as the primary programming language for both frontend and backend development. By using one language across the stack, especially for a project that includes both frontend and backend development, you have uniformity throughout the technical stack, reduced cognitive load associated with learning and combining the use of languages, and seamless integration of the client-side and server-side code. Javascript has a massive ecosystem including packages and libraries from npm with pre-built solutions and tutorials that will aid development significantly, making it an apt choice for a lone developer, or a small development team.

13.2. Frontend Framework – React.js

The frontend was built using React.js, a component framework which lets developers create reusable UI components making it easier to maintain and update in the future. React uses a virtual DOM which enhances performance when using dynamic interfaces such as dashboards and property listings or even search capabilities. In addition, React has a large ecosystem that allows for more rapid development and integration with third party libraries.

13.3. Backend Framework – Node.js with Express.js

Node.js and Express.js are used as part of the backend development. Node.js provides an incredibly fast and scalable runtime environment to handle I/O-heavy work such as API requests and processing data. Express.js is a lightweight framework that allows a developer to build a RESTful API quickly. Utilizing these

two technologies allows for communication between front-end and back-end without latency from connecting with payment gateways and notification services.

13.4. Database – MySQL

MySQL is the relational database name chosen for the implementation of structured data - so, user accounts, property information, reservations and payments. It's reliable, portable and allows support for complex querying. These attributes, along with the relational nature of databases, make it perfect for applications requiring maintaining concurrent transactions with data integrity and provide access to data quickly. MySQL also works well supporting Node.js applications, enabling efficient use of data and overall performance of the application.

13.5. Version Control – GitHub

Version control and source code management are made possible by GitHub. GitHub is designed for developers to manage backup changes as well as collaborating changes. GitHub can also manage issues, pull requests, workflows, and processes, which helps developers keep code tidy and manage workflow for project building.

13.6. IDE – Visual Studio Code

VS Code (Visual Studio Code) is selected as the integrated development environment (IDE) because it is lightweight, supports JavaScript, React and Node.js out-of-the-box, and has a large marketplace for extensions. VS Code also has integrated Git support and debugging capabilities, which are useful for a full-stack project and support ease of development.

13.7. APIs – Payment and Notification Integration

In order to facilitate online payments, APIs for eSewa, Khalti, and Stripe are also integrated. These payment gateways are both commonly used in Nepal, but also overseas internationally which helps with smoother and safer transactions. We also implemented notification services (like sending emails using Node mailer and SMS APIs), we implemented notifications to notify users of their booking, payment confirmation and updates on status results.

13.8. Libraries – Chart.js and Recharts

Chart.js and Recharts are used to build interactive charts and visual reports. These libraries enable us to present the user and administrator with significant insights derived from data from bookings, payments, and property analytics.

13.9. Design Tool – Figma

Figma is utilized to create wireframes, prototypes, and the final designs for its UI. It not only allows developers and designers to collaborate visually, but more importantly, it increases overall design consistency and allows designers to mimic interactive prototypes before build-out takes place. Figma acts as a schematic that the development teams can follow directly, ensuring they provide the best user interface possible.

13.10. Project Management – Jira

Jira is chosen as the tool to manage the project and track tasks. With its Kanban boards, customized workflows, and sprint planning features, it provides efficient tracking of project development. Identifying individual tasks and promoting collaboration is key for monitoring and current statuses of tasks and tracking progress against deadlines while establishing and maintaining transparency across the entire development process.

13.11. Testing and Deployment

To ensure that GharBhada meets user needs and functions continuously, it will be put through usability, functionality, and performance testing. Any issues flagged will be addressed before putting the application in production. The application will be deployed as a responsive web application that can run on any platform with enhanced algorithms to provide users ease of use, reliability for transactions, and security of its users. The application will be ultimately hosted on AWS or Heroku and was built to scale up or down without losing service or availability.

14. Conclusion

GharBhada is a digital rental management platform for Nepal. GharBhada provides an endto-end experience for tenants, landlords, and administration. Unlike platforms such as Lalpurja Nepal which act as property marketplaces, GharBhada embraces the entire rental value chain, including property listings and search, booking notifications, digital agreements, automated payments, utilities tracking, complaints management, and reporting with insights. This comprehensive approach will streamline the transactional process and enhance efficiency, transparency, and trust in Nepal's rental market. The platform utilizes a modern, scalable technology stack with React.js, Node.js, MySQL, and APIs. GharBhada is adopting the Kanban methodology to utilize an organized, incremental, and iterative approach to development. User feedback is to be collected continuously to help inform iterations as we move through the development cycle to ensure usability and flexibility.

GharBhada will help users simplify rental processes, help users feel secure while conducting their transactions, but also provide administration capabilities. This will enable users of GharBhada to effectively manage, make responsible decisions based on sound information, and develop trust over time. GharBhada should not be viewed as a substitute for lawyers, but rather an easy, sound enough, and intelligent digital tool that works with real world problems in Nepal's rental ecosystem.

References

1. Boeing, G., Harten, J. & Sanchez-Moyano, R., 2023. *Digitalization of the Housing Search: Homeseekers, Gatekeepers, and Market Legibility.* [Online]
   Available at: https://www.jchs.harvard.edu/sites/default/files/research/files/harvard_jchs_digitalization_panel3_boeing.pdf

2. Ferreri, M. & Sanyal, R., 2021. Platform informalities and the malleable urban order: Insights from Delhi's rental housing tenants. *Geoforum,* Volume 125, pp. 21-29.

3. Fields, D., 2019. Automated landlord: Digital technologies and post-crisis financial accumulation. *Environment and Planning A: Economy and Space,* 54(1), p. 172–189.

4. Obse, Z. G., 2025. Addis Ababa online home rental management system, Ethiopia. *Journal of Electrical Systems and Information Technology,* Volume 12, p. 29.

5. Xue, Q., Hou, Z., Ma, H. & Zhu, H., 2021. Housing rental system based on blockchain technology. *Journal of Physics: Conference Series,* 1948(1), p. 012058.