Project and Professionalism (6CS007)

Professionalism Report

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: 23 January 2026

Abstract

This report about professionalism looks at many different areas of the GharBhada project. The GharBhada project aims to be a digital rental platform for people in Nepal to rent their homes, and the report looks at how GharBhada will affect people's lives in terms of: Safety, Ethics, Social Effects, Legal Compliance, and Professionalism. Social advantages of GharBhada include increased accessibility for renters and the development of trust between renters and landlords. However, some possible disadvantages of GharBhada are that it may widen the digital divide between people who have access to the internet, and those who do not. Ethical issues related to GharBhada deal with privacy and fairness. Legal compliance issues explored in this report include compliance with laws in Nepal and internationally (such as GDPR). Security issues discussed will include how GharBhada protects the data of users. This report provides an overview of how GharBhada fosters responsible innovation and includes suggestions for mitigating problematic social effects.

Acknowledgment

I extend my sincere gratitude to my supervisor, Mr. Siddhartha Thapa, and reader, Mr. Durga Pokharel, for their invaluable guidance in shaping this professionalism report. Their insights into ethical and legal dimensions have been crucial. I also thank the University of Wolverhampton and Herald College Kathmandu for providing resources on professionalism in computing projects. Finally, appreciation goes to peers for discussions that enriched my understanding of social and security aspects.

Yours sincerely,

Krishma Shrestha

23 January 2026

Table of Contents

1. Introduction

The GharBhada platform has greatly improved the efficiency of the rental housing market in Nepal by digitizing it with integrated components including property searches, digital agreements, auto payments, and complaint management. The professionalism component of this report evaluates the implications of the GharBhada artefact and provides information on how the platform operates in a developing country like Nepal through urbanisation-related issues of housing and other associated needs. A comprehensive review of the GharBhada platform, as well as other assessments contained in literature (Ferreri & Sanyal, 2022); GharBhada Project Experience, will be used to evaluate how GharBhada meets the social, ethical, and legal responsibilities of operating in this context. The report has been prepared by module requirements, with an introduction for each section, highlights of what is of interest regarding each topic, and references to literature and project documentation.

2. Aim and Objectives

2.1 Aim

To analyse how GharBhada was created and identifies areas for improvement in the design, development, and implementation of GharBhada, as well as provide suggestions to help protect and improve GharBhada's potential.

2.2 Objectives

- To examine the positive and negative social effects of the platform such as inclusivity and possible disputes, backed by supporting research.
- To look at the data privacy and content ownership as examples of ethical issues and provide their reasons in terms of user trust and project design.
- To consider legal issues regarding the Nepali and international systems, such as GDPR requirements and copyrights.
- To consider such features of security as data processing and encryption, emphasizing the steps to ensure users and integrity.
- To recommend based on project findings and ethical approvals to increase professionalism in subsequent iteration.

3. Social Aspects

3.1 Introduction

Social impact describes the overall influence of a technological artefact on society, economy, and structure, including the positive and negative equity and efficiency contributions and the potential adverse effects on society including exclusion or worsening inequality (Friedman & Hendry, 2019). In the case of GharBhada, this is the way in which the digitalisation of Nepal by enabling certain functions such as: verified registration, trust scoring, automated payment and overseen by an administration influences the urban housing access, trust-formation and social distances in an environment of rapid urbanisation and disparities in digital adoption.

3.2 Beneficial Aspects

GharBhada has good positive social impact because it enhances the accessibility, transparency and efficiency of the Nepal rental house industry. Conventional approaches which are based on the use of brokers and personal recommendations are often associated with fraud schemes, excessive expenditures, and conflict. The proven registration, user validation of admins and badge of trust minimise the risks of exploitation by highly vulnerable populations like rural migrants or low-income residents in very high demand cities like Kathmandu. The space offers greater choice; advanced search filters, AI-based property recommendations, detail-listings (photos, amenities, rules), and reliability indicators allow tenants quicker and more equitable access to reliable choices and may reduce the search time and cost by 20-30% (BOEING, et al., 2023). Unit-based electricity/water, fixed garbage charges, automated rent/utility billing, end-of-month computations and receipts are digital, reducing human error and financial disputes and promoting responsible payment practices (Desiree , 2022). The owners can also enjoy facilitated sending of notification, approval of booking, and track payments, which reduce the administrative duties and allows the small landlords to be fairly competitive. Supervision of transactions by the administration creates general trust in the market. Adoption of local payment gateways (eSewa, Khalti) will facilitate the unbanked to be part of the system, especially women and minorities who are vulnerable to taking advantage of by informal systems (estimated 25-35% in South Asia; (United Nations Human Settlements

Programme (UN-Habitat), 2025). As internet penetration levels in Nepal urban areas surpass 60 percent (Data Reportal, 2026), GharBhada allows lowering housing disparity in the long term and enhancing community responsibility in the emerging rental sector of Nepal.

3.3 Detrimental Aspects

On the other hand, the GharBhada might increase social discrimination by becoming digitally excluded and biased. The uneven distribution of the internet penetration rates of over 70% in urban Kathmandu and rural under 40% (World Bank, 2024) might exclude the non-digital users, e.g., the elderly or the people with low literacy levels, who can turn to the services of the fraudulent brokers and back the inequalities. Phase 1 (no mobile apps) is more accessible only via the web, which restricts access to populations that might be relying on smartphones, increasing rural-urban disparities where analog solutions are prevalent (Obse, 2025). The positive attraction of trust scoring is that it is discriminatory towards new owners (called regular until it is one year old), but small or informal landlords and market concentration against well-known ones, the incentive to competition. Urban-biased trained AI-driven recommendations may suggest that the peripheral areas are not addressed, which will reinforce geographical inequality (BOEING, et al., 2023). Payment and agreement automation may impose on low incomes tenants the digital literacy burden, causing input and notification errors when entering utility information, and subjecting them to greater financial pressure (Desiree , 2022). Digital platforms may make markets informal (Ferreri & Sanyal, 2022), which is dangerous without careful design to create uneven accessibility. Since in Nepal, property transactions are driven by social media, and it favors the city elites (Purbeli Real Estate, 2023), the aspects of GharBhada may deliberately or inadvertently marginalize the poor, including ethnic minorities or women, without paying enough attention to cultural sensitivities (e.g., using only Nepali as an interface). These harms are pertinent due to the data-dependent nature of the platform, which requires the alleviation of the system-related challenges by using Kanban iteratives in supporting multilingual services and offline solutions.

3.4 Case Scenario and Unlikely Event

Functional case scenario: A rural migrant tenant in Kathmandu with low income is trying to reserve a property through GharBhada but does not have access to proper internet because the poorest connection is required, thus being screened out due to lack of citizenship documentation and exposed to exploitative middlemen, which causes fraudulent payments and makes one more vulnerable. This raises the risks of digital divide in practice.

Unrealistic scenario: There is a spike in city migration and the platform overloads (running on AWS/Heroku), halting bookings at the Opportune moment and displacing thousands of users, striking a blow to the digital solutions and leading to anti-technology sentiment in the Nepali housing industry.

3.5 Supporting Research and References

The discussion relies on (Friedman & Hendry, 2019), on the value-sensitive design to achieve social equity, (BOEING, et al., 2023) on the market expansion of digital platforms, and (Desiree , 2022) on the benefits of accountability in automation, reducing to the context of Nepal in the data provided by the (World Bank, 2024) regarding urbanization and digital access.

4. Ethical Aspects

4.1 Short Introduction

Technological ethical behavior relates to ethical standards of design and application, in relation to privacy, fairness, non-harm and responsibility (Brey, 2012). In the case of GharBhada, it would involve the analysis of how the data gathering (e.g., citizenship numbers, financial information) and other attributes, such as the use of trust scoring and AI recommendations, may affect the user rights and equity in the diverse Nepalese community.

4.2 Relevant Ethical Concerns

The ethical issues associated with GharBhada include the privacy of the data used because sensitive data is collected at the time of registration (name and address and citizenship number and ID proof) and data on payment/billing is saved in MySQL which will be easily abused unless the customer (a registered user) gives their consent. This violates autonomy when users do not know about data usage to score trust or AI capabilities, especially when users are lowly digitally literate (41% of social media penetrated in Nepal, (Data Reportal, 2026)). The biases in recommendations or in fraud detection related to algorithms may be unjustly discriminatory of the rural or minority user in the case of data bias towards urban profiles, going against the principle of fairness (Friedman & Hendry, 2019). As an example, the original owners may be advantaged with trust badges, disadvantaging new entrants. Automated brokering and payments (e.g. unit-based utilities) require accuracy in order not to overcharge, and it is accountable as it can result in financial damage if the error is not detected (Obse, 2025). Equity is essential; since the platform targets urban Nepal, there is a risk to keep risk groups out of the platform, which will contradict non-maleficence. (Xue, et al., 2021) note that transparent contracts are the key to establishing trust, so GharBhada can use e-signatures, but additional possibilities are needed in terms of opt-out and bias audit. Approval of Ethics displayed the emphasis on value-sensitive design through the Figma prototype and its related feedback loops as this was important to have user-centred iterations. Therefore, GharBhada's automation end-to-end increases the ethical risk and responsibilities of the business in an emerging market that is under-regulated.

4.3 Case Scenario and Unlikely Event

Case scenario, where a tenant is going to have a low trust score based on the biased AI (e.g. due to poor connectivity in the rural regions), the reservation will not be approved and the tenant will be denied the chance to have a house, which only contributes to social isolation and raises an ethical concern.

Unrealistic scenario: An algorithm in utility factors that charge many tenants more than necessary generates financial stress sweeping over the site, and people abandon the platform, which is how automated systems fail to exceed their controls.

4.4 Supporting Research and References

The tech ethics framework is presented by (Brey, 2012), and techniques of trust and scalability in rental services are presented by (Xue, et al., 2021) and (Obse, 2025), including (Friedman & Hendry, 2019), on the bias mitigation in the Nepalese context.

5. Ethical Aspects

5.1 Short Introduction

The legal aspect concerns the liability to adhere to data, transactions, intellectual property, equality, and cybersecurity laws in the country and internationally, and possible liability in the event of failure (Stallings, 2017). These aspects of personal data, digital contracts, payment and user content require GharBhada to adhere to Nepal legislation and extraterritorial requirements such as like GDPR.

5.2 Key Legal Aspects

5.2.1 Nepal-Specific Laws

The Individual privacy act of Nepal 2018 guarantees the privacy of personal data (e.g., citizenship numbers, addresses) gathered during the registration, regulating its usage with the consent and ensuring safe processing; failure is punishable with a fine of up to NPR 30,000 and imprisonment (Neupane Legal, 2025). GharBhada has to provide deletion features, which are applicable to store payment details. Digital agreements and e-signatures are recognized and legitimate in the Electronic Transactions Act 2006, which supports the conclusion of leases but specifically requires the securing of the methodology: otherwise, such contracts will lose their validity (Corporate Biz Legal, 2025). Copyright Act 2002 protects the photos/rules uploaded by users, where the liability of platform in the case of infringements is the fines (NPR 5,000-200,000; Prime Law Associates, 2025). CRM The payment and Settlement Act 2019 governs eSewa/Khalti integrations of deposits/payments, whereby NRB complies to avoid laundering (NRB, 2025). Bylaw 2020 of Cyber Security requires audits and encryption of the data handling (NTA, 2020). The features of GharBhada that are applicable are the ones that entail regulating functions.

5.2.2 International Laws

GDPR is applicable when the EU data is processed (i.e. through Stripe) by imposing the right of consent and right to delete (European Union, 2016). There is a ban on discriminatory trust scoring provided by the Equality Act 2010 (UK) which has an effect on oversight of universities (United Kingdom Government, 2010). They guarantee worldwide conformity to the diaspora users.

5.3 Case Scenario and Unlikely Event

Case scenario: A tenant disputes a digital agreement in court claiming that the ambiguity of the validity of the e-signature under the Electronic Transactions Act can be resolved by use of audit trails but this shows that certifications are required.

Unrealistic scenario: Data leaks following a breach, resulting in Privacy Act fines and GDPR fees in case of affected users in the EU, and closure.

5.4 Supporting Research and References

(Stallings, 2017) on cyber laws with Nepal-specific sources such as (Neupane Legal, 2025) and (Nepal Rastra Bank, 2025), and GDPR (European Union, 2016) to both international connections.

6. Ethical Aspects

6.1 Short Introduction

The aspects of security include the logical safeguarding of confidentiality, integrity, and availability (CIA triad) of data and systems against violation, alteration, release, interference, or destruction by unauthorized parties (Stallings, 2017). Within the framework of GharBhada a web-based rental management system where the storage of highly sensitive personal and financial data (including citizenship number, ID proofs, bank details, payment records, addresses and lease agreements) are collected, processed, and stored down to the bare gold a developed system of controls enhancing safety is not only a technical requirement but also an essential professional responsibility. Lack of proper protection on the platform may lead to identity theft, financial fraud, reputation damage, and loss of user confidence especially in the context of Nepal which is developing but still highly vulnerable digital environment where cyber threats are growing with digital uptake.

6.2 Key Security Measures and Risks

GharBhada uses several security control layers to protect user information and ensure the system shall be reliable:

- Secure Communication: All data in transit will be encrypted with HTTPS and TLS 1.3 which means that confidential information (e.g., login credentials, booking requests, payment details) is not resigned throughout the transmission between the users and the server.
- Data Encryption at Rest: Sensitive data in the MySQL database like their citizenship numbers, bank account numbers, records of payment transactions and entire addresses are encrypted using strong algorithms (e.g., AES-256); this should ensure that it cannot be compromised even when its database is compromised.
- Authentication and Authorization: JSON web tokens (JWT) are utilized to have secure stateless session management. Admin and high-risk owner accounts are to receive multi-factor authentication (MFA). Role-Based Access ControlRollike uses the principle of least privilege to the letter: tenants have access to view and modify their own booking and

complaints, owners to access their listed properties and the associated transactions, and the administrators have higher but limited privileged access.

- Input Sanitization and Protection against SQL Injection: All user enclosed data (property details, search filters, complaints description) are strictly sanitized and verified with prepared statements to prevent SQL injection, output is also encoded and Content Security Policy (CSP) is also set to prevent cross-site scripting (XSS).
- Secure Third-party Integrations: The payment gateways (eSewa, Khalti, Stripe) are connected to their official and tokenised API which does not pass any full card or bank information to the application server. Encrypted providers are used in the notification services (email/SMS).

Key Risks

Nevertheless, risks remain phishing attacks masquerading as booking/payment notifications may cause users to provide credentials or bank details; insider vulnerabilities are possible by the admins having higher access; core vulnerability may exist in the payment gateway or library (e.g. outdated npm packages); and supply-chain attacks on dependencies can happen. In the situation of Nepal, these are contributing to the increase in cybercrimes (e.g., fraud, hacking), which may cause data exposure of citizenship/ID proofs. This is dealt with by the Bylaw which elections of licensees (also applies to internet facing platforms) to perform risk assessment, provide training regarding awareness, and disseminate threat information through national/international efforts. These actions and threats are very applicable to GharBhada with end features of transactions e.g. automated end-of-month dues (rent minus deposit plus utilities), e-signatures (digital agreement) and payments overseen by an administrator, where just one breach can lead to the loss of money, identity-theft, or lack of confidence in the Nepal rental ecosystem.

6.3 Case Scenario and Unlikely Event

Case scenario: A tenant is sent a high-end phishing (looks like it was sent by GharBhada) email includes the logo of the platform and a bogus link to pay deposit money on a newly approved booking. The site provides the bank credentials to a fraud site and thus, leads to unauthorized withdrawal of funds. It emphasizes the overall risk of a social engineering attack on users of different degrees of digital literacy.

Unlikely Event: A ransomware group uses an unidentified vulnerability in the web server or a third-party dependency that is then used to encrypt the production MySQL database storing all of the user records, all payment history, and all active lease agreements. These result in total service outage during the most active period of rental 2020 would lead to manual recovery measures, need for a recovery process that is required as mandated by the Cyber Security Bylaw 2020, and could also attract regulatory fines, civil litigation, and a loss of user trust in online rental services in Nepal in the long run.

6.4 Supporting Research and References

It is based on (Stallings, 2017) who outlines such core ideas in the encryption protocols (TLS), authentication and different methods (e.g. token, digital signature), secure session management, and protection against common web threats (e.g. injection, XSS) all of which are central to the architecture of GharBhada. Regulations specific to Nepal are contained in the Cyber Security Bylaw 2077 (2020), such as the encryption of transit/at-rest data, access control, quarterly audits, incident response, and sharing of threat intelligence (Nepal Telecommunications Authority, 2020). According to recent studies on web application security based on financial/transaction platform (2025 best practices), zero-trust, MFA, RBAC and constant monitoring are used to secure sensitive flows, such as payments and personal data (e.g. in rent collection software). These sources affirm the applicability and strength of security design of GharBhada in a risky sphere.

7. Conclusion

The concept of GharBhada is that of software development, professionally responsible, consideration to the fusion of technological innovation, and the main values of computing professionalism. The platform provides significant social value by enhancing efficiency, increasing transparency, strengthening trust, and making the Nepal renting market, which is rapidly urbanizing, fairer, and is actively involved in combating the negative effects of digital divide and increasing biasness. On the ethical front, it focuses on the privacy of users, algorithmic fairness (trust scoring and recommendations), and responsibility in automated processes, with the value-sensitive design and constant feedback to users. GharBhada is legally in compliance with the Individual Privacy Act 2018, Electronic Transactions Act 2006, Payment and Settlement Act 2019, Cyber Security Bylaw 2020 and other global standards, such as GDPR and the Equality Act 2010, to enforce digital contracts, payment safety, and privacy of personal data. Encryption, role-based access control, API secure integration, and planned regular audit are used to strengthen security mechanisms to protect sensitive user information and enhance wellbeing. The project has flexibility and receptiveness to new risks and societal requirements by taking an iterative approach to the Kanban process based on ethical approval and community feedback. Finally, GharBhada does not only commercialize Nepal but also, shows how a final year student-led project can play a significant role in benefiting the social good and yet maintain the best ethical, legal, and safe standards of practice in computing.

References

BOEING, G., HARTEN, J. & SANCHEZ-MOYANO, R., 2023. *Digitalization of the Housing Search: Homeseekers, Gatekeepers, and Market Legibility,* s.l.: Joint Center for Housing Studies, Harvard University.

Available at: https://www.jchs.harvard.edu/sites/default/files/research/files/harvard_jchs_digitalization_panel3_boeing.pdf

Brey, P. A. E., 2012. Anticipating ethical issues in emerging IT. *Ethics and Information Technology,* 14(4), p. 305–317. Available at:https://doi.org/10.1007/s10676-012-9293-y

Corporate Biz Legal, 2025. Nepal Electronic Transactions Act Overview.

Data Reportal, 2026. *Digital 2026: Nepal,* s.l.: s.n.

Available at:https://datareportal.com/reports/digital-2026-nepal

Desiree , F., 2022. Automated landlord: Digital technologies and post-crisis financial accumulation. *Environment and Planning A: Economy and Space,* 54(1), p. 160–181. Available at:https://doi.org/10.1177/0308518X19846514

European Union, 2016. *General Data Protection Regulation (GDPR) (Regulation (EU) 2016/679),* s.l.: s.n. Available at:https://eur-lex.europa.eu/eli/reg/2016/679/oj

Ferreri, M. & Sanyal, R., 2022. Digital informalisation: Rental housing, platforms, and the management of risk. *Housing Studies,* 37(6), p. 1035–1053. Available at:https://doi.org/10.1080/02673037.2021.2005009

Friedman, B. & Hendry, D. G., 2019. *Value Sensitive Design: Shaping Technology with Moral Imagination.* s.l.:MIT Press. Available at:https://doi.org/10.7551/mitpress/7585.001.0001

Nepal Rastra Bank, 2025. *Payment and Settlement Act Guidelines,* s.l.: Nepal Rastra Bank.

Nepal Telecommunications Authority, 2020. *Cyber Security Bylaw 2020.* [Online].

Neupane Legal, 2025. Individual Privacy Act Nepal.

Obse, Z. G., 2025. Addis Ababa online home rental management system, Ethiopia. *Journal of Electrical Systems and Information Technology,* 12(1), p. 1–17.

Available at:https://doi.org/10.1186/s43067-025-00220-1

Prime Law Associates, 2025. *Copyright Act Nepal.* [Online].

Purbeli Real Estate, 2023. *Social Media in Nepal Property Markets,* s.l.: s.n.

Stallings, W., 2017. *Cryptography and Network Security: Principles and Practice.* 7th ed. ed. s.l.:Pearson.

United Kingdom Government, 2010. *Equality Act 2010.* [Online] Available at: https://www.legislation.gov.uk/ukpga/2010/15/contents

United Nations Human Settlements Programme (UN-Habitat), 2025. *Housing Exploitation in South Asia,* s.l.: UN-Habitat.

World Bank, 2024. *Nepal Urbanization Report,* s.l.: World Bank Group.

Xue, Q., Hou, Z. u., Ma, H. & Zhu, H., 2021. Housing rental system based on blockchain technology. *Journal of Physics: Conference Series,* 1948(1), p. 012058. Available at:https://doi.org/10.1088/1742-6596/1948/1/012058