ONLINE BUSINESS PERMIT APPLICATION AND TRACKING SYSTEM

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Requirements for the Degree
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INTRODUCTION

Project Context

According to Doing Business 2020, in the digital age, businesses are increasingly required to adapt to online services for efficiency and accessibility. However, despite advances in technology, many local government units (LGUs) still rely on outdated manual systems for processing business permits. Consequently, this reliance often leads to delays, increased bureaucracy, and frustration for Applicants. Moreover, inefficient business permit systems hinder entrepreneurship and discourage foreign investment in high-growth markets**.**

The Philippines' Local Government Code of 1991, or Republic Act No. 7160, has significantly reorganized the operations of Local Government Units (LGUs) in governance and service delivery. The code aims to strengthen LGUs to better respond to their constituents' unique needs and provides them with the power to govern themselves, creating programs and services attuned to local needs. It encourages community participation in planning and decision-making, employing public consultations and participatory budgeting. This decentralization allows LGUs to prioritize without awaiting national government instructions, allowing them to act promptly to new developments and modify services according to community dynamics.

Base on Department of Trade and Industry Philippines, (2023), the Business Permit Application has provisions, mandates, and laws, including the Local Government Code of 1991, which authorizes LGUs to enact their own ordinances on business permits and licenses. This decentralization ensures regulations fit local conditions and needs, ensuring a business-friendly climate at the local level. The Department of Trade and Industry (DTI) provides guidelines on the registration procedure for companies, facilitating a swift and transparent permitting process.

The study of Zercoe, C. (2024) said, manual licensing processes are time-consuming due to data entry and paperwork management issues, causing challenges for municipalities, businesses, and public safety. The continuous cycle of applications and renewals makes the manual process cumbersome, making it difficult for businesses and municipalities to move through the steps. Therefore, a more efficient and streamlined approach to business permit applications is necessary, highlighting the necessity of an Online Business Permit Application and Tracking System.

In some municipalities in Catanduanes, such as San Miguel, where some barangays are far from the municipality, Applicants often have to ride a tricycle or bus to visit the municipal hall for applying and renewing of a business permit. In addition, they need to carry all the paper documents, including the documents for new applicant; Application Form for Business Permit, DTI Registration, Barangay Clearance, Fire Safety Certificate, Sanitary Permit, Health Inspection, and Building Permit. Also, for renewing the required documents are the Barangay Clearance, a filled-up Unified Form, and the Income Tax of the Previous Year. Consequently, if they forget any document, they must return to complete their application, as incomplete requirements may prevent

them from obtaining a business permit. Moreover, one of the requirements for applying for a business permit is the Fire Safety Certification, which can take a month to obtain, potentially causing delays in getting the business permit. Currently, the Business Permit and Licensing Office, operates manually in the services of applying and renewing business permit, applicant need to wait in the municipal hall while processing their business permit, the LGU staff tracks the transaction completion for processing business permits by listing the permits that are complete. Afterwards, once the mayor signs the Mayor's/Business Permit, it is returned to the Business Permit and Licensing Office to be recorded manually in the business monitoring report, which is how they track the transaction of processing business permits.

The rationale for developing an Online Business Permit Application and Tracking System is to streamline and modernize the process of obtaining business permits, which traditionally involves time-consuming manual procedures, physical paperwork, and multiple office visits. This system aims to provide a convenient, efficient, and transparent platform for Applicants to apply for permits, submit required documents, and monitor the status of their applications. By digitizing these processes, it reduces administrative burdens on Local Government Unit (LGU) staff, minimizes errors, and enhances overall service delivery. Additionally, the system promotes transparency and accountability, curbs opportunities for corruption, and supports economic growth by enabling faster business registration and compliance. Ultimately, this project seeks to improve accessibility and user experience for applicants while optimizing the operations of LGUs through automation and better tracking mechanisms.

Purpose and Description

The Online Business Permit Application and Tracking System is a user-friendly platform designed to streamline the process of acquiring business permits for various stakeholders, including entrepreneurs and Applicants, Local Government Units (LGUs), and the community and economy by encouraging entrepreneurship and contributing to economic growth, job creation, and community development.

The system offers a seamless experience for users by allowing online submission and release of applications, enabling clients and administrators to interact effortlessly. Both clients and admins have access to a dynamic dashboard where they can monitor the progress of their applications. The system also provides comprehensive status tracking, so users are always informed about the current stage of their requests. Additionally, it features robust document management capabilities, allowing users to store and upload important files securely within the platform. To keep everyone updated, the system automatically sends notifications and alerts through emails, ensuring that no critical updates are missed. Overall, this integrated solution streamlines the application process, enhances communication, and improves transparency for all parties involved.

The project's rationale is to address long-standing issues such as excessive wait times, bureaucratic inefficiencies, and lack of communication between applicants and government authorities. By streamlining the process and providing a platform the system enhances user experience and satisfaction. The implementation of the Online Business Permit Application and Tracking System can lead to broader implications,

such as enhanced economic activity, public confidence in government services, and encouragement of e-government practices.

Objectives

The main objective of this research is to develop an Online Business Permit Application and Tracking System that will streamline the end-to-end business from submission, approval, and release of permits as well as monitoring of the application status for both clients and local government unit (LGU).

Specially, the objective of this study are the following;

1. Develop a web-based system for applying and tracking the business permit for pilot implementation at the Local Government Unit of San Miguel.
2. Provide users with the online application submission and releasing platform with dashboard for monitoring progress for both client and admin, status tracking, document management able to store and upload, and notifications and alerts through emails
3. Evaluate the system using the ISO/IEC 25010 software quality metrics by both end-users and technical experts under the following parameters:
   a. Functional Suitability
   b. Performance Efficiency
   c. Compatibility
   d. Interaction Capability
   e. Reliability

f. Security

g. Maintainability

h. Flexibility

i. Safety.

Scope and Limitations

The Online Business Permit Application and Tracking System is developed that will speed up the entire process from submission of application to approval and issuance of licenses. It will also enable clients and the local government unit (LGU) to monitor the status of their applications. The project target beneficiaries are the entrepreneurs and Applicants, Local Government Units (LGUs), and the community and economy. The study will primarily focus at LGU San Miguel to be pilot implement only, allowing for a detailed analysis of local conditions, regulations, and user needs.

While the Online Business Permit Application and Tracking System seeks to address many existing issues in the permit application process, there are notable limitations; (a) the system will not integrate payment portal (b) the system will not accommodate walk-in application (c) this study will only focus on business permit application and renewing, and will not cover other LGU services. This project aims only to provide services in applying business permit to releasing and the tracking of the application.

Definition of Terms

This section outlines these terms to provide clarity and facilitate effective communication among stakeholders including Applicants and local government unit (LGU) staff. Certain key terms are essential for understanding the functionalities and components of the system.

Barangay Clearance, this document certifies that the Applicant is a resident of good standing within their barangay and has no outstanding issues within the community. It's often a prerequisite for other permits.

Building Permit, his permit, obtained from the LGU's engineering office, authorizes the construction, renovation, or alteration of a building. It's necessary if the business involves a physical structure.

Business Permit a crucial document issued by the Local Government Unit (LGU) that allows businesses to legally operate within its jurisdiction, ensuring compliance with local regulations and tax obligations.

Compatibility refers to the degree to which a software product can operate effectively in conjunction with other software products or systems. It is an important quality characteristic that assesses how well the software can coexist and interact with other applications, platforms, or environments.

DTI Registration (Department of Trade and Industry), it is the registration of the business name with the DTI. For sole proprietorships, this is a crucial step in

establishing legal business identity. Corporations and partnerships register with the Securities and Exchange Commission (SEC).

Filled-up Unified Form, Many LGUs now use a unified application form for business permit renewal, simplifying the process.

Fire Safety Certificate, this certificate, issued by the Bureau of Fire Protection (BFP), confirms that the business premises meet fire safety standards. It ensures adequate fire prevention and protection measures are in place.

Functional Suitability refers to the degree to which a software product meets the specified requirements and fulfills the intended purpose for which it was designed. It is a critical quality characteristic that assesses whether the software provides the necessary functions to achieve the desired outcomes.

Flexibility as a crucial quality characteristic for Information and Communication Technology (ICT) products. It signifies a product's capacity to adapt to evolving requirements and diverse operational environments without significant issues. This adaptability is vital for ensuring long-term value and reducing the costs of future modifications

Health Inspection, it is an assessment conducted by health officials to ensure the business meets hygiene and safety standards. It often precedes the issuance of a sanitary permit.

Income Tax Return (ITR) of the Previous Year, this document is required to assess the business's tax liability and update its records.

ISO/IEC 25010 is a standard that defines a quality model for software products, focusing on characteristics such as functionality, reliability, usability, efficiency, maintainability, and portability. It serves as a framework for assessing software quality in the customer-supplier process.

Interaction Capability is not explicitly defined as a standalone characteristic. However, it can be understood as a component of the broader quality characteristic of Usability, which focuses on how effectively and efficiently users can interact with the software.

Maintainability refers to the degree to which a software product can be modified to correct defects, improve performance, or adapt to a changed environment. It is a critical quality characteristic that assesses how easily and efficiently the software can be maintained over its lifecycle, ensuring that it remains functional and relevant as requirements evolve.

Online Business Permit Application and Tracking System is an electronic platform that simplifies the application and management of business permits. It provides an online application, tracking in real time, efficiency, accessibility, linkages to other government databases, and a user-friendly interface. The system minimizes the requirement for physical paper and personal appearances, increasing transparency and reducing delays. It also offers a friendly interface, facilitating easier use for people with different technical skills.

Performance Efficiency refers to the degree to which a software product effectively utilizes resources while delivering the required performance under specified

conditions. It is a critical quality characteristic that assesses how well the software performs in terms of speed, resource usage, and overall efficiency.

Reliability refers to the degree to which a software product can maintain its performance under specified conditions for a specified period. It is a critical quality characteristic that assesses the software's ability to function consistently and dependably over time, ensuring that it meets user expectations and requirements.

Sanitary Permit, issued by the local health office, this permit verifies that the business complies with sanitation and hygiene regulations, especially critical for food establishments.

Security refers to the degree to which a software product protects information and data, ensuring confidentiality, integrity, and availability. It is a critical quality characteristic that assesses the software's ability to safeguard against unauthorized access, data breaches, and other security threats.

Safety is identified as a key quality characteristic. It represents the degree to which a product, under defined conditions, avoids endangering human life, health, property, or the environment. This is a crucial aspect, especially for systems where malfunctions could have severe consequences.

Conceptual Framework

The conceptual model for the Online Business Permit Application and Tracking System is intended to give a systematic framework for comprehending the elements,

processes, and interactions of the system. Through the Input-Process-Output (IPO) model, this conceptual model outlines how inputs are converted by certain processes into desired outputs. The IPO model is best used to show information flow and interaction among various parts of the system. By clearly defining these components, the framework provides a guide for the development, implementation, and evaluation of the system, thus ensuring that it meets the needs of stakeholders, including entrepreneurs, Applicants, LGUs, and community and economy. It ensures efficiency, transparency, and user satisfaction in the business permit application process.

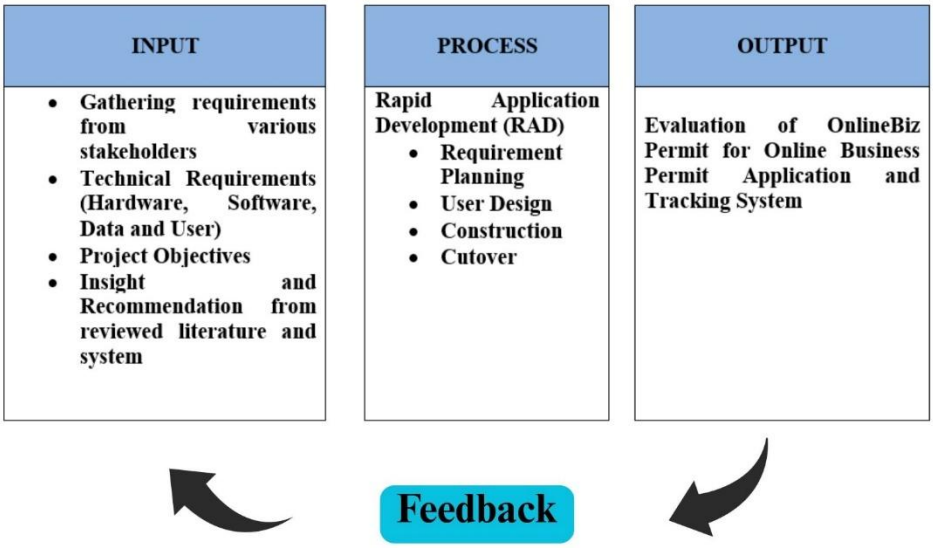

Figure 1. Conceptual Framework

The input phase is crucial for laying the groundwork for the project. It involves gathering requirements from various stakeholders to understand their needs and expectations. This includes determining technical requirements, such as hardware and software specifications, as well as data and user needs. Establishing clear project

objectives ensures that the development goals are aligned with stakeholder expectations. Additionally, insights and recommendations from reviewed literature and existing systems provide valuable context and guidance for the development process.

The process phase employs the Rapid Application Development (RAD) methodology to efficiently create the system. It begins with requirement planning, where the gathered information is analyzed to outline specific functionalities and design features. This is followed by user design, where stakeholders are engaged to validate and refine the design through iterations. Construction involves the actual coding and development of the application, ensuring it meets predefined specifications. Finally, the cutover phase focuses on transitioning the project into a live environment, ensuring all components are properly integrated and functional.

The output of the project is the evaluation of the OnlineBiz Permit for the Online Business Permit Application and Tracking System. This comprehensive system allows for streamlined application processes and tracking of permits, enhancing efficiency for both users and the administrative body. The successful implementation of the system culminates in improved accessibility and user satisfaction, ultimately fulfilling the original project objectives outlined during the input phase.

CHAPTER 3

TECHNICAL BACKGROUND

In this chapter we discuss about the technology that we are about to use for technical development for the proposed system

Hardware Requirements

Hardware requirements refer to the essential physical components and specifications necessary for a computer system or software application to operate efficiently and effectively. These requirements ensure that the system has adequate processing power, memory, storage, and peripheral capabilities to support the intended tasks and workloads.

Table 1. Hardware Requirements

Hardware Requirement	Specification	Description
Server	11th Gen Intel(R) Core(TM) i3-1115G4 @ 3.00GHz 3.00 GHz, 64-bit operating system, x64-based processor	Handles backend processing and data storage.
Workstations	i5 Processor, 16GB RAM	For administrative users to handle applications.
Networking Equipment	Router (Gigabit), Switch (24-port)	Manages network traffic and connects devices.
Storage Device	External Drives, 64GB	For quick data retrieval and backups.
Printer	Epson Printer	For printing business permits and documents.
Scanner	Document Scanners	For digitizing physical documents into the system.

This table provides a comprehensive list of hardware requirements for a computing system, including servers, workstations, networking equipment, storage devices, printers, and scanners. The server is a robust 11th Gen Intel Core i3-1115G4 processor, responsible for managing data and supporting applications. Workstations have an i5 processor with 16GB RAM, enabling smooth application execution. Networking equipment includes a router and 24-port switch, managing network traffic and connecting devices. Storage devices include external drives for quick data retrieval and backups. The printer is an Epson printer for printing business permits and documents, while scanners digitize physical documents. Proper investment in these components can enhance productivity, ensure data safety, and streamline workflow processes.

Software Requirement

This section outlines the software requirements for our project, detailing the key components necessary for building a robust and efficient application. The requirements include specifications for the web server, database management system, frontend framework, and backend framework

Table 2. Software Requirements

Software Requirement	Specification	Description
Web Server	Apache	Serves web applications and handles HTTP requests.
Database Management System	MySQL	Stores user data, application data, and transaction logs.
Frontend Framework	HTML/CSS	Provides a dynamic and responsive user interface.
Backend Framework	PHP	Manages server-side logic and API interactions.

The table outlines the essential components for building a web application, each with a specific role in its functionality and user experience. Apache is a widely-used web server that handles HTTP requests and delivers content. MySQL is a relational database management system that stores and manages user data, ensuring data consistency and integrity. HTML/CSS is used to style and layout web pages, enhancing user experience across different devices. PHP and JavaScript are the backbone for server-side logic, managing API interactions, data processing, and supporting dynamic functionalities. Together, these components ensure a seamless and robust web experience.

Data Requirements

This section outlines the data requirements necessary for effective analysis within the context of business licensing at the Local Government Unit (LGU) of San Miguel.

Table 3. Data Requirements

Construct/ Variables	**Source of Data**	**Data Gathering Technique**	**Instrument**	**Data Processing**
Business Application Form	Business Permit and Licensing Office at LGU San Miguel	Document Analysis	Document Review	Content Analysis
Employees of Business Permit and Licensing Office	Business Permit and Licensing Office at LGU San Miguel	Interview	Questionnaires	Content Analysis
Required Documents for Applying	Business Permit and Licensing Office at LGU San Miguel	Documentary Analysis	Document Review	Content Analysis
Systems Evaluation	Evaluation Form	Descriptive Survey Method	Survey Questionnaire	1.Mean 2.Frequency Count 3.Percentage/Likert Scale

The table provides a comprehensive overview of data requirements for a study on business applications and licensing processes. Key constructs include the Business Application Form, Employees of Business Permit and Licensing Office, and required documents for applying. Data is sourced from the Business Permit and Licensing Office at LGU San Miguel. Data gathering techniques include documentary analysis and interviews, with each construct using documents and structured interviews. The data will be processed using a Database Management System for storage, management, and analysis. This structured approach ensures comprehensive data collection and analysis, providing effective insights into the business licensing process.

User Requirements

This section outlines user requirements for data collection for Online Business Permits and Tracking System at San Miguel's LGU, outlining constructs and variables for systematic information processing.

Table 4. User Requirements

Module	Function	Description	User Role
Applicant Module	Login	Allow applicant to access the system	Applicant
	Apply for Business Permit	Submit new business permit application	Applicant
	Upload Documents	Upload required documents for the application	Applicant
	Track Application Status	Monitors the status of their application.	Applicant
	Receive Notifications	Receives updates and notifications regarding their application.	Applicant
	Upload Receipt of Payment	Uploads proof of payment.	Applicant

LGU Staff Module	Review Application	Reviews the submitted application and documents.	LGU Staff
	Approve/Reject Application	Approves or rejects the application based on review.	LGU Staff
	Verify Documents	Verifies the authenticity and completeness of the uploaded documents.	LGU Staff
	Manage Application Status	Updates the status of the application (e.g., pending, approved, rejected).	LGU Staff
	Validate Receipt of Payment	Verifies the payment.	LGU Staff
Administrator Module	Manage Users	Manages user accounts (adds, edits, deletes).	Administrator

	Generate Reports	Generates reports on application status, user activity, etc.	Administrator
	Maintain System	Performs system maintenance tasks (e.g., updates, backups).	Administrator

The table outlines various modules for the submission and tracking of business permit applications. It consists of three functions: Application Submission, Application Tracking, Notifications, and Reports. The Application Submission module allows users to submit their applications online, while Application Tracking allows users to track their progress in real-time. Notifications send notifications about status changes, while Reports generates reports on submitted applications. The tables cater primarily to Applicants and Admins, with the Application Tracking module accessible to Staff. They emphasize real-time updates and reporting capabilities.

CHAPTER 4

DESIGN AND METHODOLOGY

This chapter discusses the project technical description, system features, and methodology used for the project.

Requirements Analysis

The Online Business Permit Application and Tracking System aims to streamline the process of applying for, approving, and managing business permits within the Local Government Unit (LGU) of San Miguel. This document outlines the functional and non-functional requirements based on stakeholder consultations, literature review, and analysis of existing systems.

Functional Requirements

Functional requirements define the specific actions or services the system must perform. The following are identified for the Online Business Permit Application and Tracking System.

Table 5. Functional Requirements

Functional Requirements	Definition
User Registration and Authentication	• Allow Applicants to create accounts and log in securely.

	• Provide role-based access for different user types (e.g., applicants, LGU staff, administrators).
Application Submission	• Enable Applicants to fill out and submit business permit applications online. • Allow users to upload required documents (e.g., Barangay Clearance, Fire Safety Certification).
Application Tracking	• Provide a dashboard for applicants to track the status of their applications. • Notify applicants of any updates or required actions via email or SMS.
Review and Approval Workflow	• Allow LGU staff to review submitted applications and documents. • Enable staff to approve or reject applications with comments. • Facilitate communication between applicants and LGU staff regarding application status.
Reporting and Analytics	• Generate reports on application statistics, processing times, and revenue generated from permits. • Allow administrators to analyze data for decision-making and process improvement.
Document Management	• Store and manage uploaded documents securely. • Enable easy retrieval of documents for review and auditing purposes.
User Support	• Provide a help section with FAQs and contact information for support. • Allow users to submit support tickets for technical issues.

Non-Functional Requirements

Non-functional requirements define the performance, security, usability, and scalability expectations of the system. The following are identified

Table 6. Non-Functional Requirements

Non-Functional Requirements	Definition
Performance	• The system should handle at least 300 concurrent users without performance degradation. • Application submission and processing should not exceed 10 seconds under normal load.
Security	• Implement secure user authentication and authorization mechanisms. • Ensure data encryption for sensitive information (e.g., personal details, payment information). • Regularly conduct security audits and vulnerability assessments.
Usability	• The user interface should be intuitive and user-friendly, requiring minimal training for users.
Scalability	• The system should be designed to accommodate future growth, allowing for an increase in the number of users and applications without significant rework. • Support integration with other government systems and databases as needed.
Reliability	• The system should have an uptime of 99.9%, ensuring availability for users at all times. • Implement backup and disaster recovery procedures to prevent data loss.
Maintainability	• The system should be easy to maintain and update, with clear documentation for developers. • Allow for modular updates to individual components without affecting the entire system.

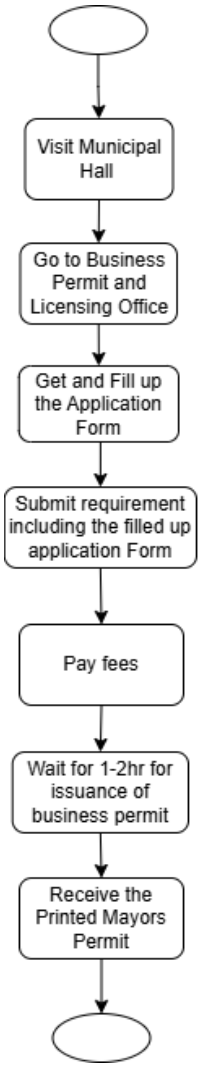

Figure 2. Existing Process

The process of applying for a business permit in a municipality involves visiting the Municipal Hall, visiting the Business Permit and Licensing Office, filling out the application form, submitting required documentation, paying any applicable fees, waiting for issuance, and receiving the printed Mayor's Permit. This systematic approach ensures that all necessary procedures are followed, and compliance with each step is crucial for a smooth application process. The waiting period for processing the

application and issuance of the business permit is expected to be 1-2 hours. The printed Mayor's Permit is the final step, allowing the applicant to legally operate their business within the municipality.

Requirements Documentation

The Online Business Permit Application and Tracking System aims to streamline the application process, reduce bureaucratic delays, and improve user experience for applicants and LGU staff. Transitioning from traditional manual systems to a digital platform fosters entrepreneurship and economic growth. The documentation outlines functional and non-functional requirements, constraints, assumptions, and dependencies, ensuring stakeholders are aware of potential limitations and considerations.

Table 7. Constraints, Assumptions and Dependencies

Constraints	Assumptions	Dependencies
Must adhere to local, state, and federal regulations regarding business licensing and data protection.	It is assumed that businesses will be willing to adopt the online system and actively participate.	Success of the project may depend on the support of government entities and local business organizations.
Existing infrastructure may not support new technologies required for the system. Limited internet access in certain areas could hinder user participation.	Assumes that users possess the necessary digital skills to navigate the online application efficiently.	Dependence on third-party vendors for software development and maintenance, requiring timely delivery and quality assurance.
Limited funding may restrict features that can be implemented or the scale of outreach.	Assumes that the information provided by users will be accurate and truthful.	The effectiveness of the system may rely on continuous feedback from users for improvements and updates.

Design of Software, Systems, Product and/or Processes

This section outlines a structured approach to designing a comprehensive permit application management system, incorporating various functionalities aimed at streamlining application processes, ensuring data integrity, and enhancing communication.

Context Diagram

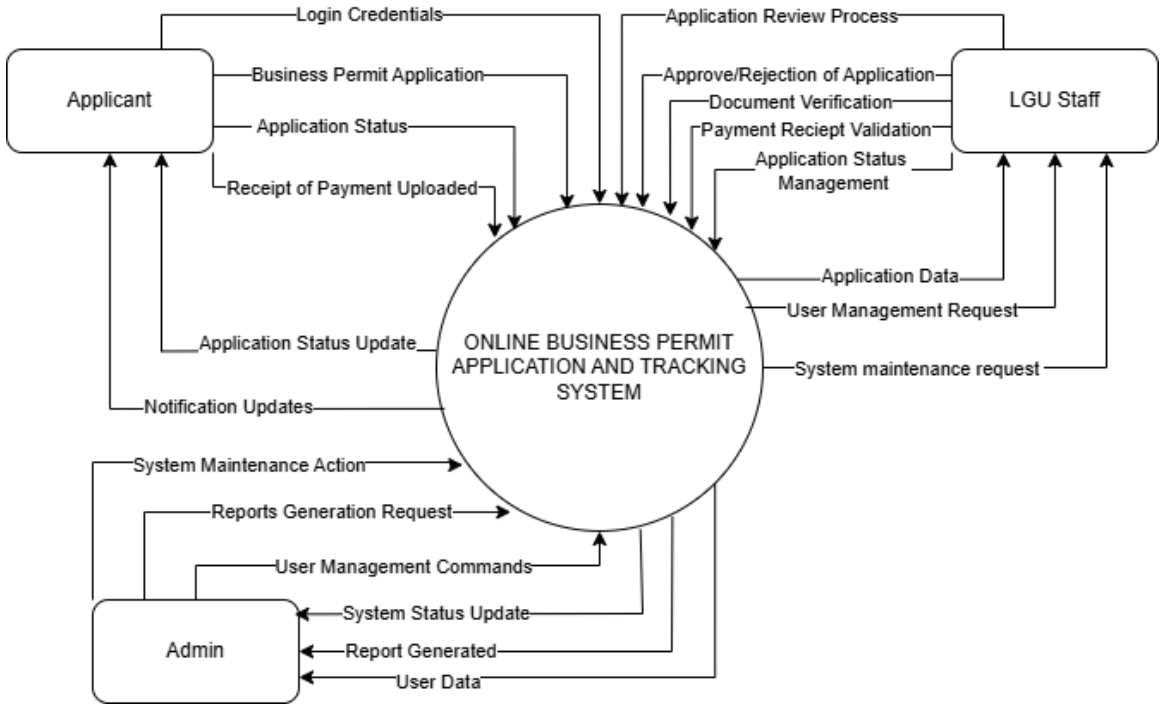

Figure 3. Context Diagram

The Online Business Permit Application and Tracking System is a comprehensive system that streamlines the process of applying for business permits,

improves communication between stakeholders, and ensures efficient management of applications and system maintenance. The system comprises key components such as the Applicant, Admin, LGU Staff, and the core system. The Applicant has login credentials, the Business Permit Application, allows users to upload payment proofs, and can check the status of their applications. The Admin handles system maintenance, generates reports, manages user accounts, and provides system status updates. The LGU Staff review submitted applications, make decisions on application outcomes, verify documents, confirm payments, and update the system based on outcomes. The system also assists in managing user access and permissions. The system's data flow diagram illustrates the interaction and data flow among components, ensuring effective communication between applicants and LGU staff.

Data Flow Diagram

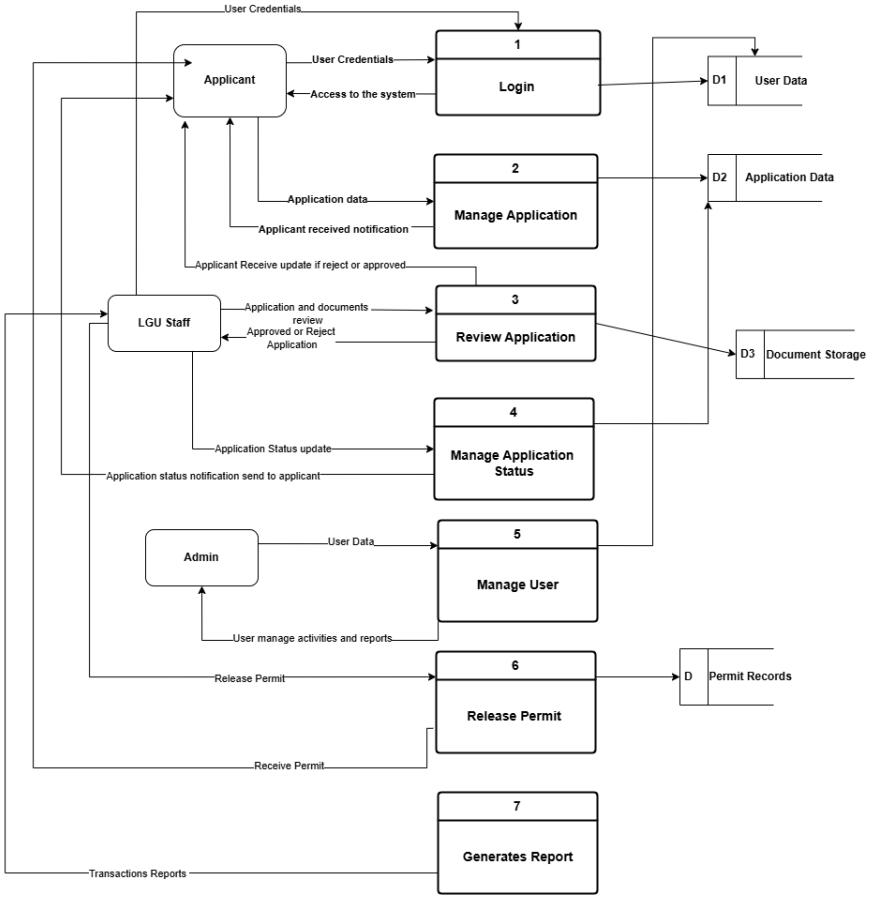

Figure 4. Data Flow Diagram

The diagram illustrates a workflow for a permit management system, involving multiple user roles including applicants, local government unit staff, and administrators. The workflow includes login, managing application, reviewing application, updating application status, managing user, releasing permits, and generating reports. The system includes user data, application data, document storage, and permit records. Feedback mechanisms, such as status updates and notifications, ensure all participants are informed about application progress. The structured flow presents a clear visual of the application process from submission to permit release, emphasizing the roles of each participant. This systematic approach aids in clarity,

efficiency, and better communication between applicants and LGU staff. The workflow includes feedback mechanisms such as status updates and notifications, ensuring all participants are informed about the application progress.

User Diagram

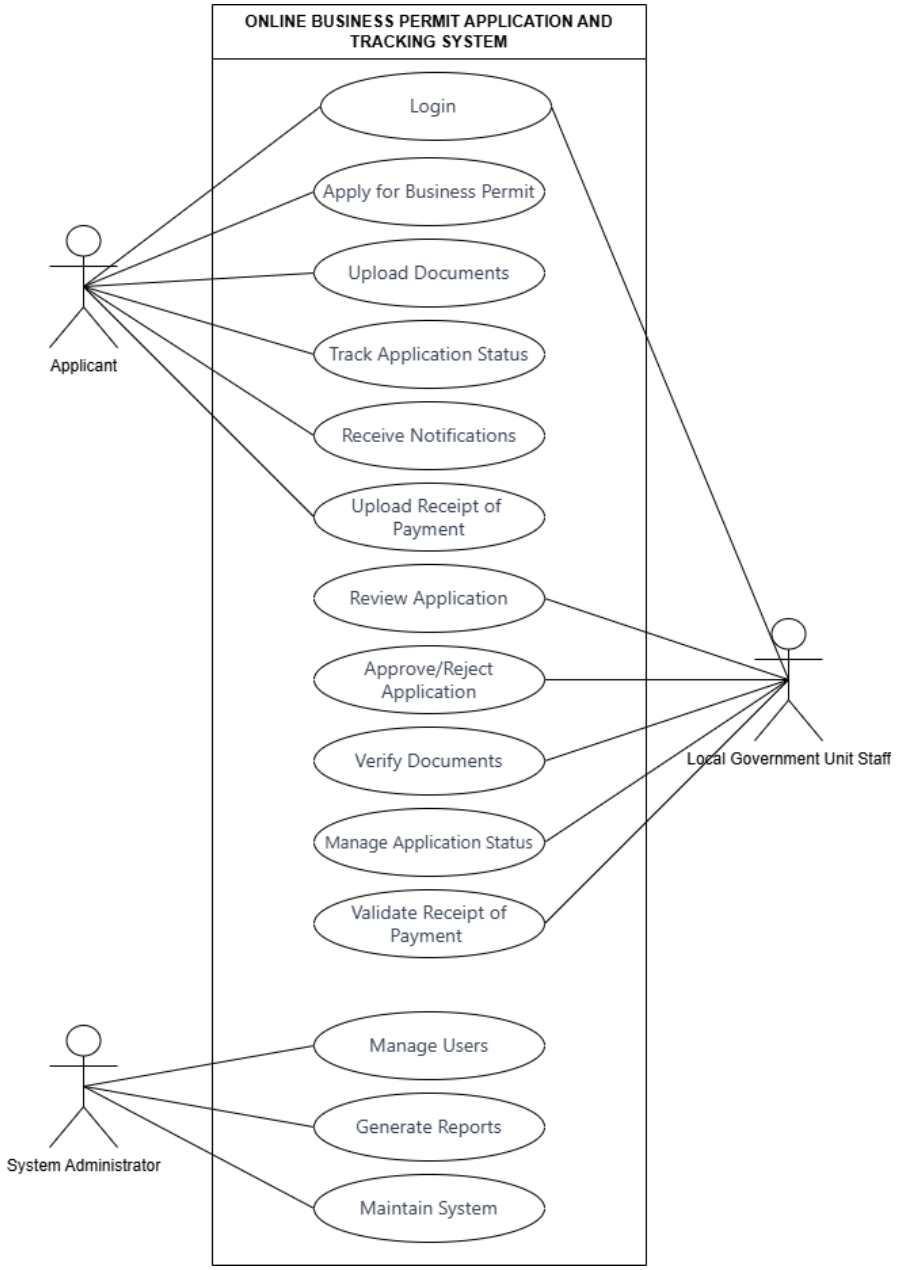

Figure 5. User Diagram

The diagram depicts an Online Business Permit Application and Tracking System, designed to streamline the application and management of business permits. It serves three primary user roles: applicant, Local Government Unit Staff, and System Administrator. The applicant can log in securely, apply for a business permit, upload documents, track application status, receive notifications, upload receipts of payment, and review applications. Local Government Unit Staff review applications, approve/reject them based on compliance and documentation, verify documents, manage application status, and validate receipts of payment. System Administrators oversee user accounts, maintain access control and security, generate reports, and maintain the system's functionality. The diagram effectively outlines the workflow and roles involved in the online business permit process, enhancing efficiency and transparency. It highlights critical interactions that improve permit management and user experience.

Activity Diagram

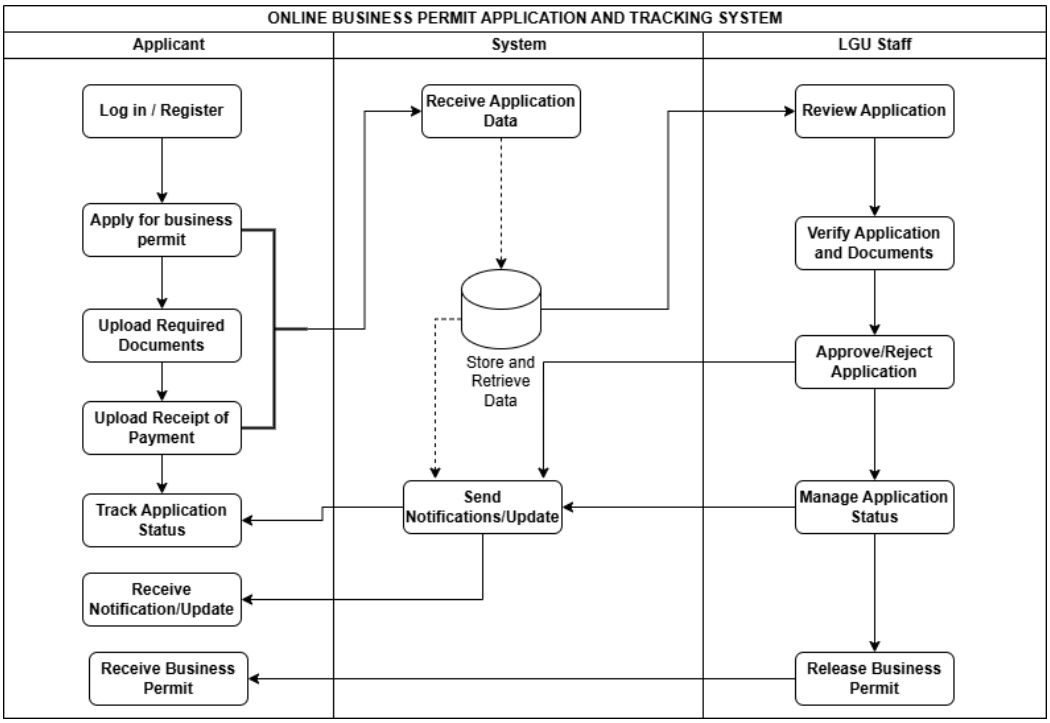

Figure 6. Activity Diagram

The diagram depicts an online Business Permit Application and Tracking System, outlining the processes involved for applicants, system interactions, and local government unit (LGU) staff. The system involves logging in, applying for a business permit, uploading required documents, tracking application status, and receiving notifications. It also functions to receive application data, store and retrieve data, and send notifications/updates. LGU staff are responsible for reviewing applications, verifying them, approving/rejecting applications, managing application status, and releasing the permit. Key features include a streamlined process, improved accessibility, automated notifications, and efficient record management. The system reduces time spent on manual verifications and paperwork, improves accessibility,

keeps applicants informed at every stage, and ensures efficient record management through digital storage of documents. The system enhances efficiency for both applicants and LGU staff, facilitating a smoother process for business permit applications.

Entity-Relationship Diagram / Database Schema

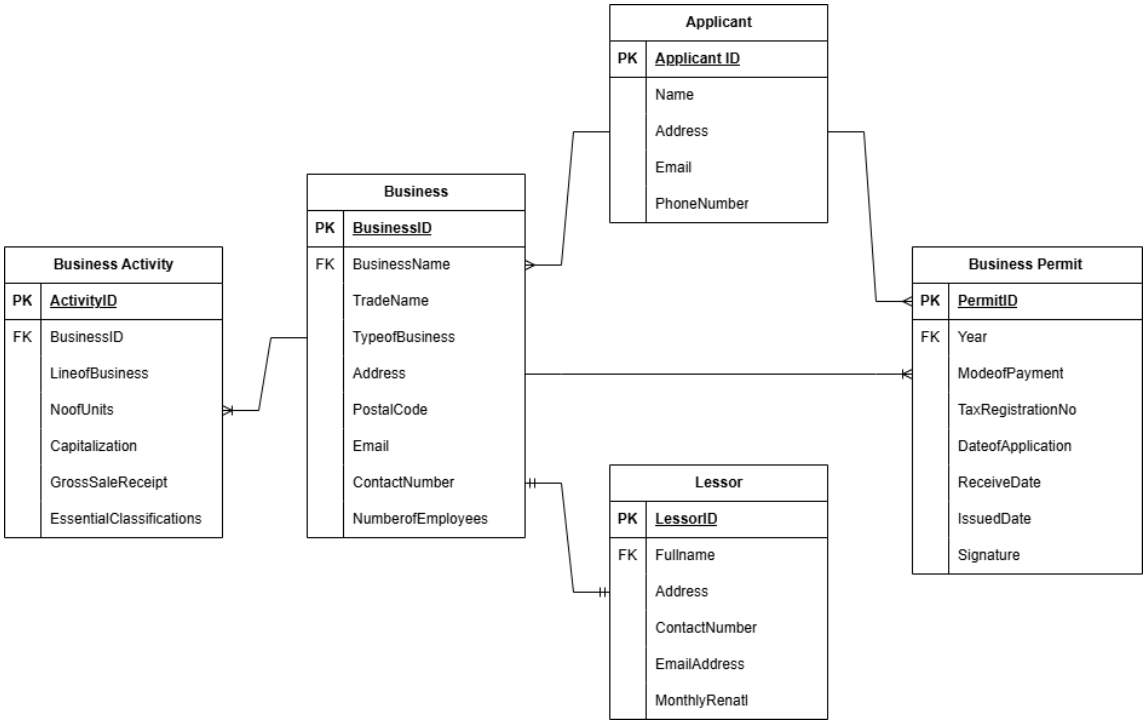

Figure 7. Entity Relationship Diagram

The diagram illustrates the key components of a business application process, including the applicant, business, business activity, business permit, and lessor. The applicant is the individual or organization seeking to establish or modify a business, while the business is the entity or operation they wish to conduct. The business activity involves specific actions or operations performed by the business, such as providing services or products. The business permit is a legal authorization required for the business to

operate, ensuring compliance with local laws and regulations. The lessor is the person or entity that leases property to the applicant for conducting their business. The interconnections between the applicant and business illustrate a typical process flow in setting up and managing a business. Understanding these relationships is crucial for entrepreneurs to navigate the regulatory landscape effectively. This structured representation highlights the essential steps and documentation required in establishing and running a business, ensuring all legal and operational bases are covered.

System Architecture

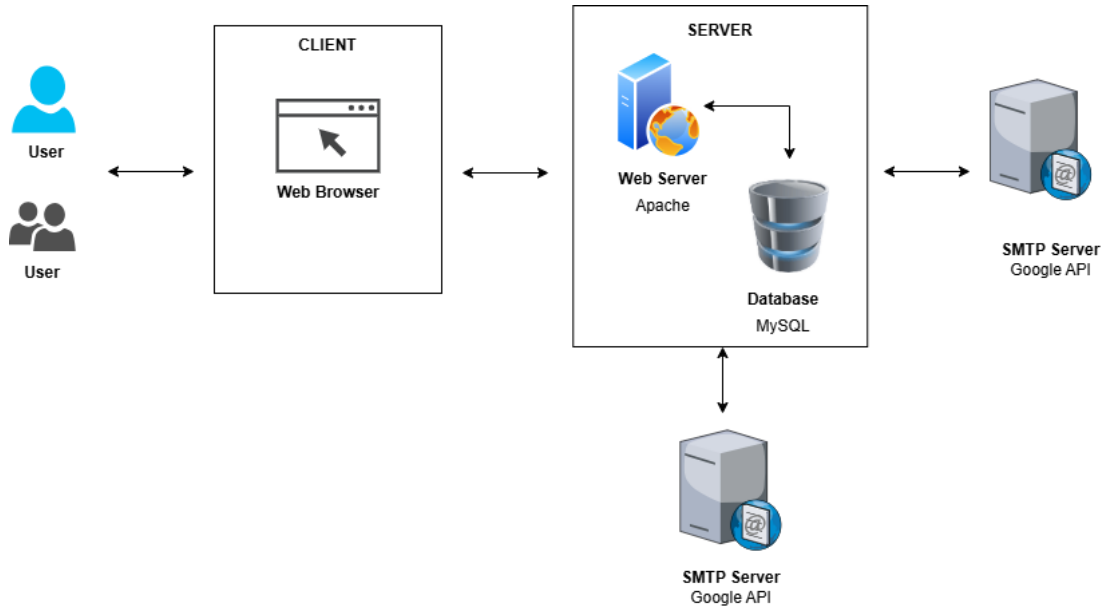

Figure 8. System Architecture

The client-server model is a distributed application structure that divides tasks between service providers (servers) and service requesters (clients). The diagram consists of a client, a web browser, a server (Apache), a web server (MySQL), and a database (Apache). The client interacts with web applications by sending requests to the server, which fetches data and displays web pages. The server handles incoming HTTP requests, processes them, retrieves data from the database, and sends the response back to the client. The communication flow involves a request-response cycle, where the client sends a request to the server, the server processes the request, queries the database, and sends the response back to the client. The client-server architecture is scalable, allows clear separation of concerns, and ensures data integrity and efficient retrieval using a database like MySQL.

Storyboard

Applicant Side

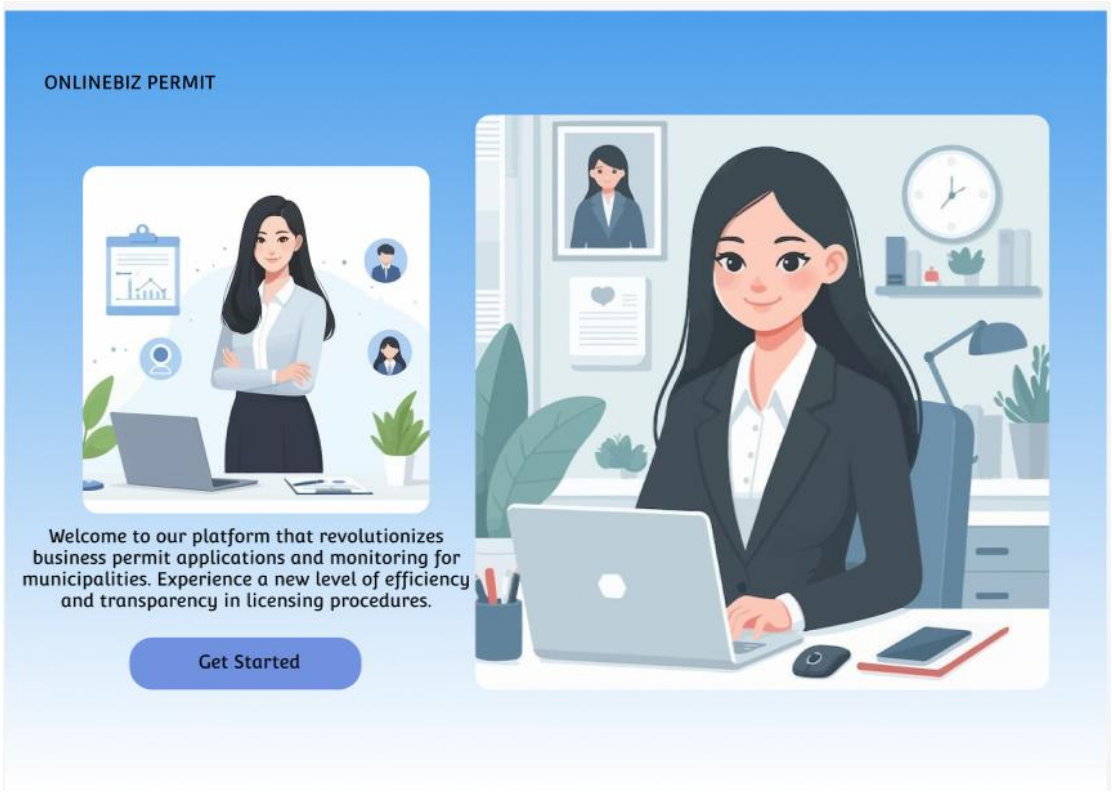

Figure 9. Get Started Page

The image showcases a web application for business permits, this is the started page of the website.

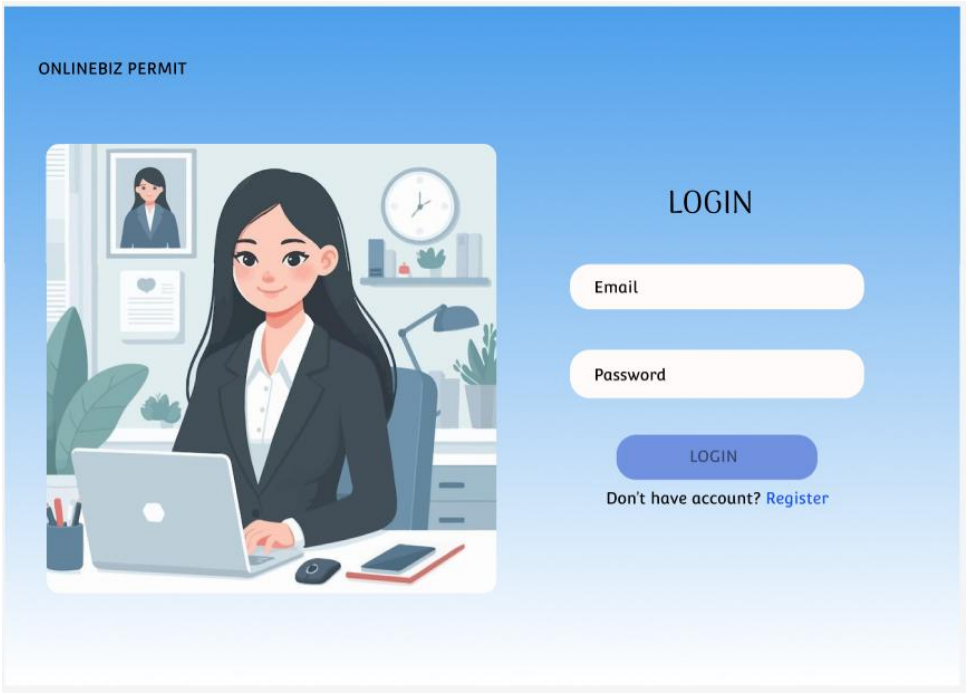

Figure 10. Login/SignUp

The image shows a login page for a website called "ONLINEBIZ PERMIT". The page features a cartoon illustration of a businesswoman working on a laptop in her office. The login form requests an email address and password. There's also a "Register" link for users who don't have an account.

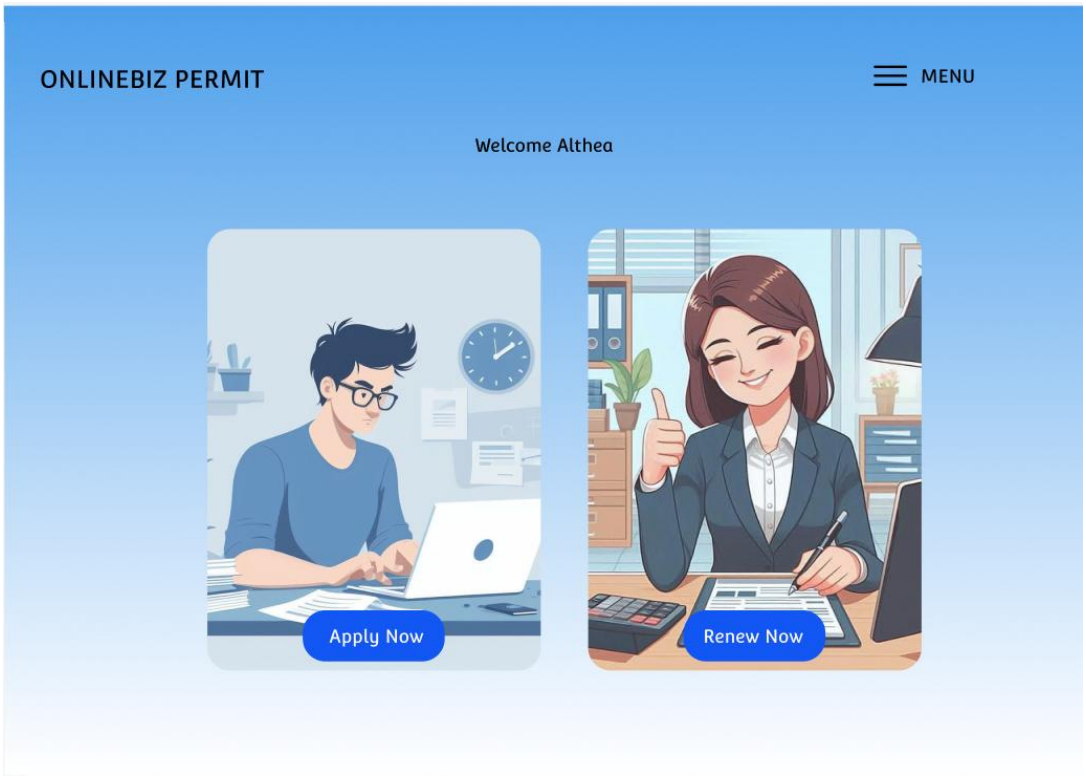

Figure 11. Homepage

ONLINEBIZ PERMIT website welcome page features "Apply Now" and "Renew Now" options, illustrated with office settings. The "Apply Now" button leads to a new application form, while the "Renew Now" button renews an existing permit.

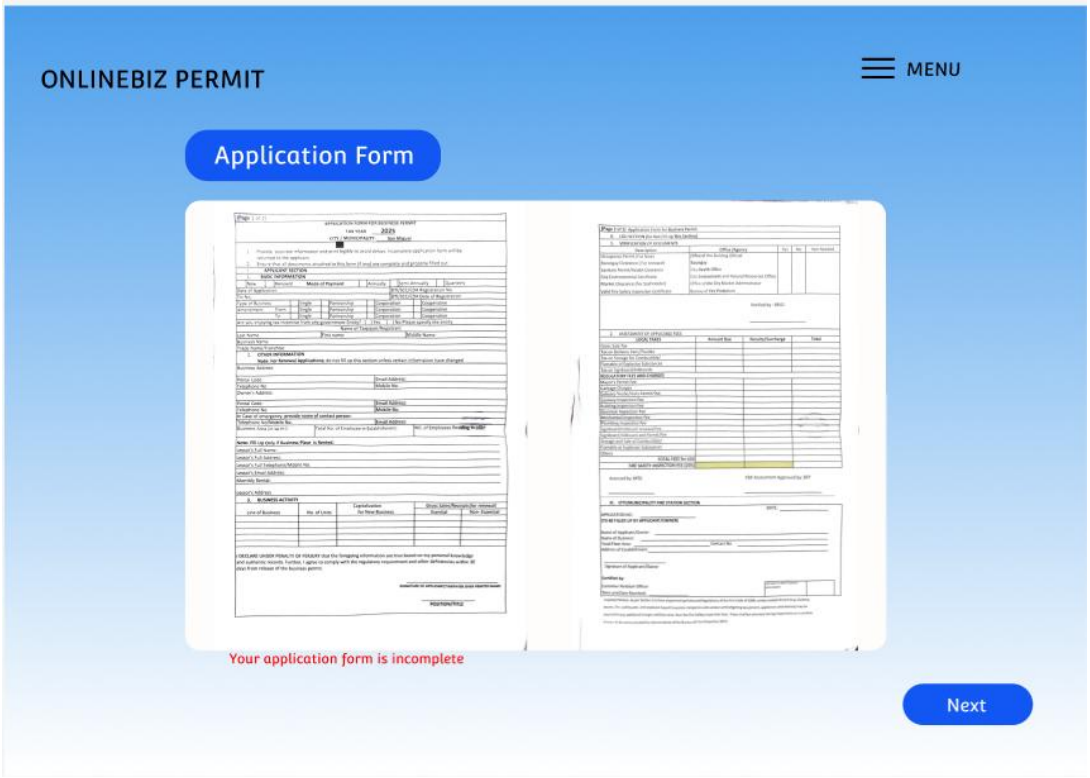

Figure 12. Application Form

The image shows an incomplete online business permit application form, requiring various business and owner details. The form includes sections for business information, owner information, location, activity, and payment, with a "Next" button for further steps.

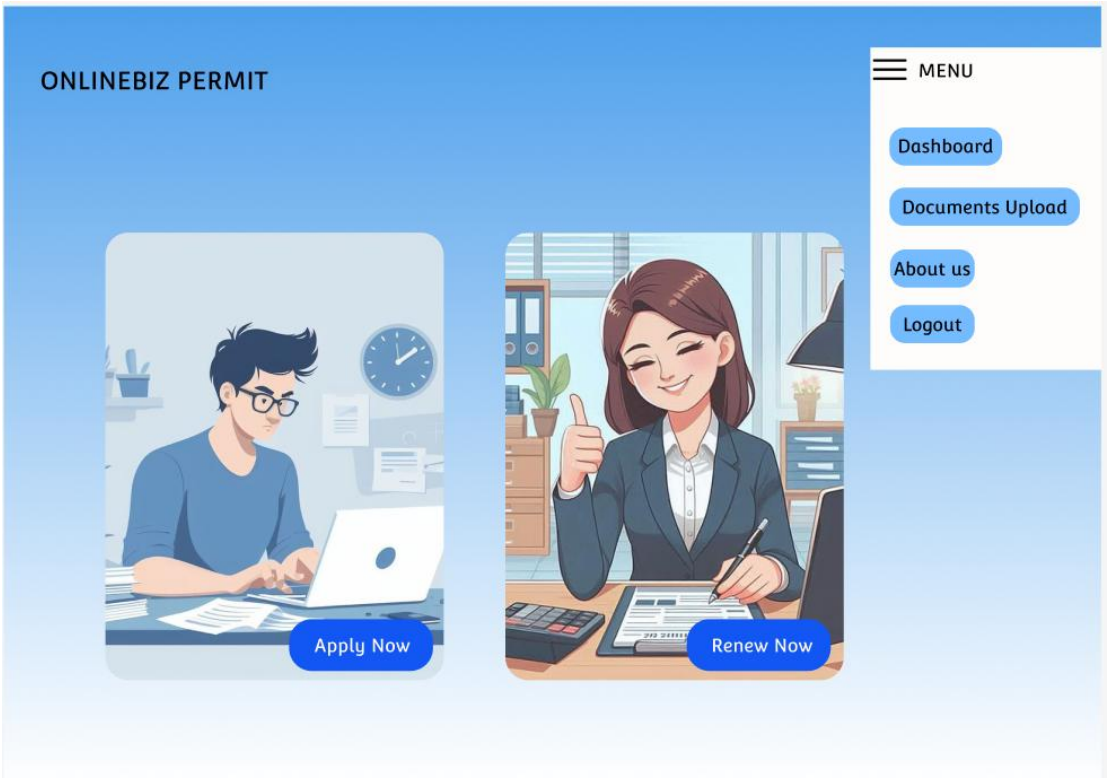

Figure 13. Menu

The image showcases a menu details were when you click the menu you can see the dashboard, documents upload, about us and logout.

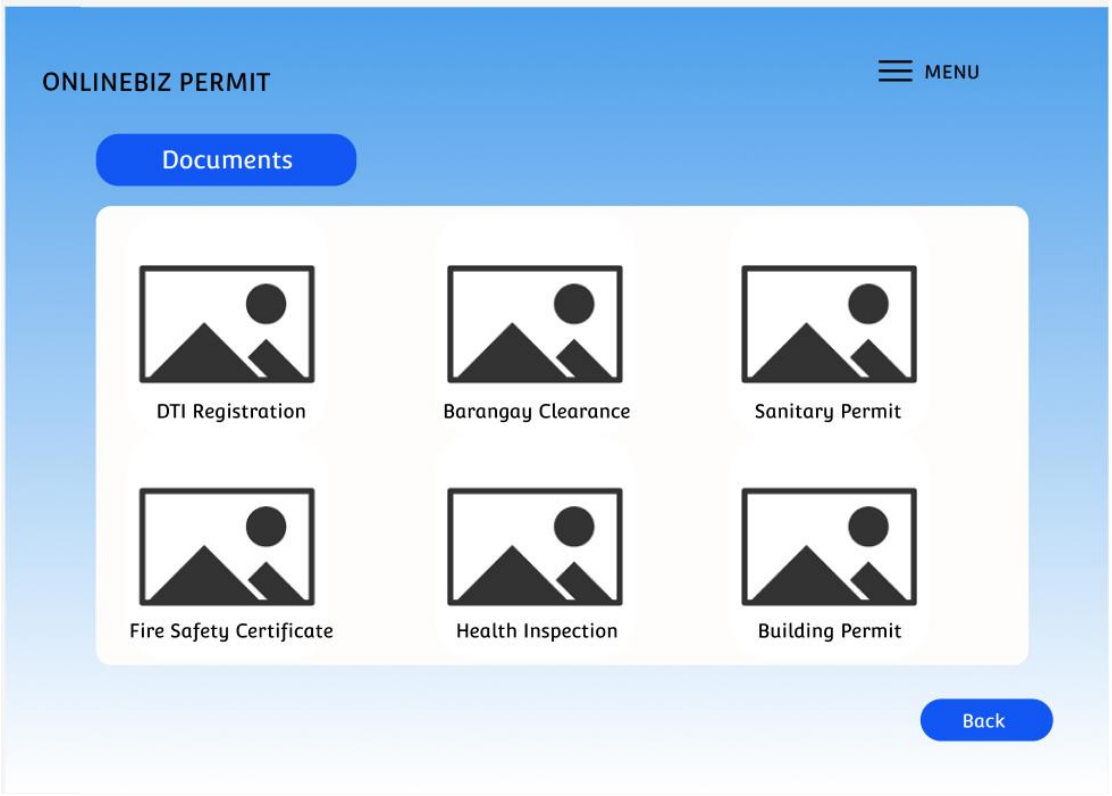

Figure 14. Documents Upload

This is a page from the ONLINEBIZ PERMIT website displaying a list of required documents. Each document (DTI Registration, Barangay Clearance, Sanitary Permit, Fire Safety Certificate, Health Inspection, and Building Permit) is represented by a generic image placeholder. A "Back" button allows the user to navigate to a previous page. A "MENU" button is visible in the upper right corner.

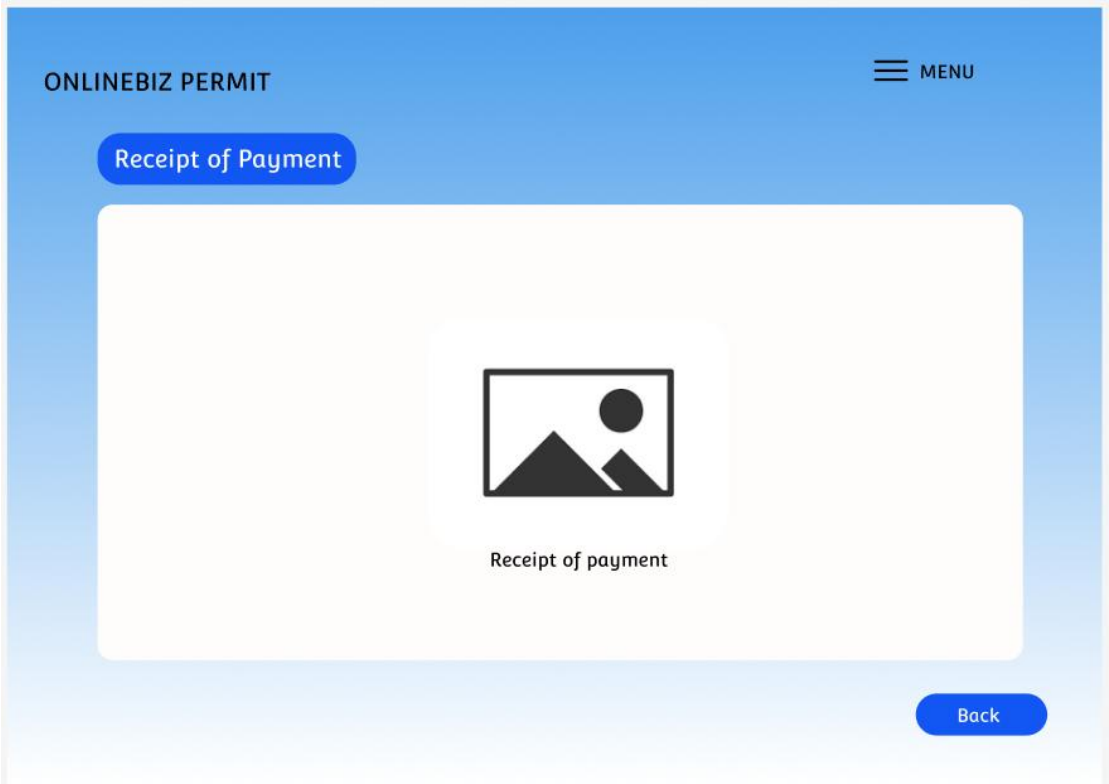

Figure 15. Receipt of Payment

This is a section of the ONLINEBIZ PERMIT website dedicated to uploading proof of payment. It displays a generic image placeholder where the user is expected to upload their payment receipt. A "Back" button is available for navigation. A "MENU" button is visible in the upper right corner.

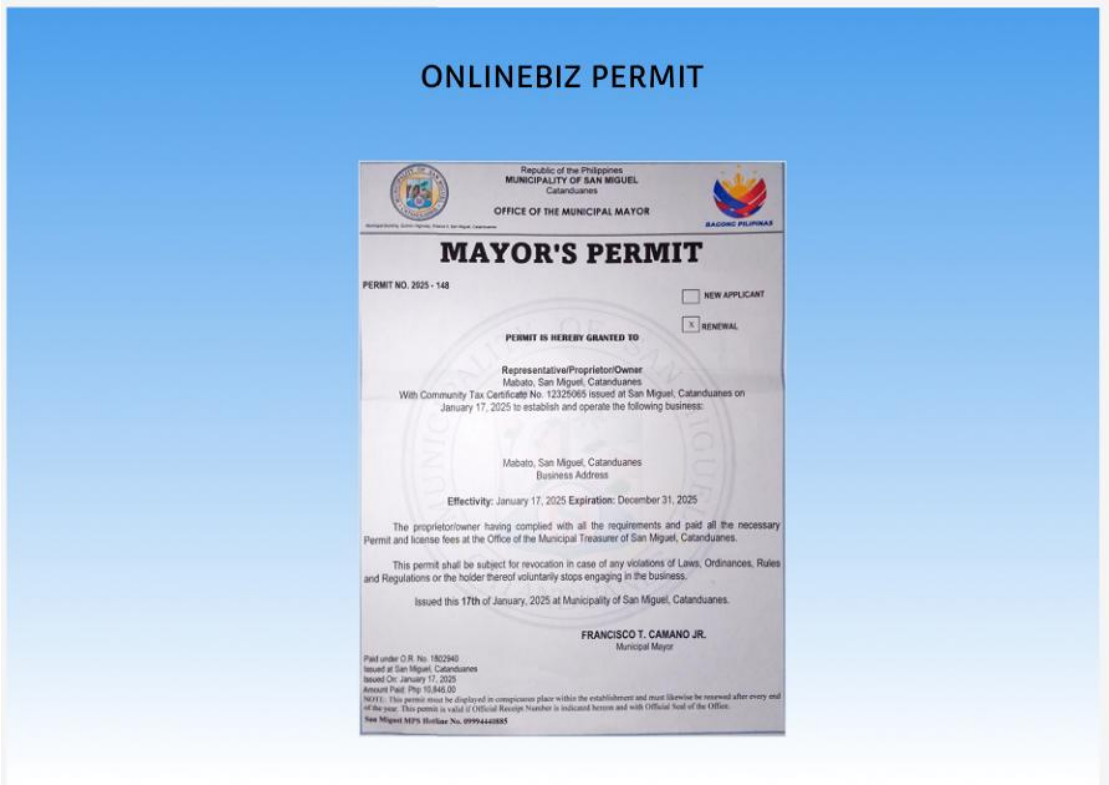

Figure 16. Released Business Permit

The image shows a Mayor's Permit issued by the Municipality of San Miguel, Catanduanes in the Philippines. The permit, number 2025-148, is a renewal for a business located in Mabato, San Miguel, Catanduanes. The permit's effective date is January 17, 2025, and its expiration date is December 31, 2025. The permit is signed by Francisco T. Camano Jr., the Municipal Mayor. The document includes payment information and instructions for its display.

LGU Staff Side

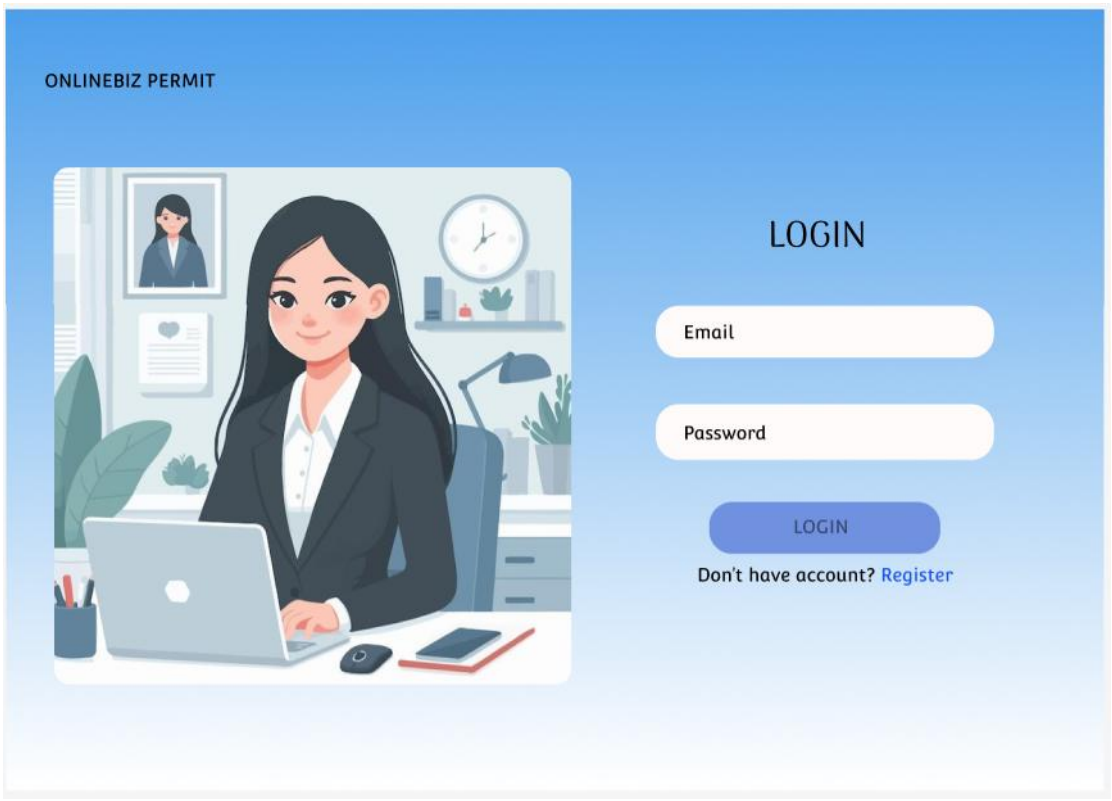

Figure 17. Log in or Sign Up of LGU Staff

The image shows a login page for a website called "ONLINEBIZ PERMIT". The page features a cartoon illustration of a businesswoman working on a laptop in her office. The login form requests an email address and password. There's also a "Register" link for users who don't have an account.

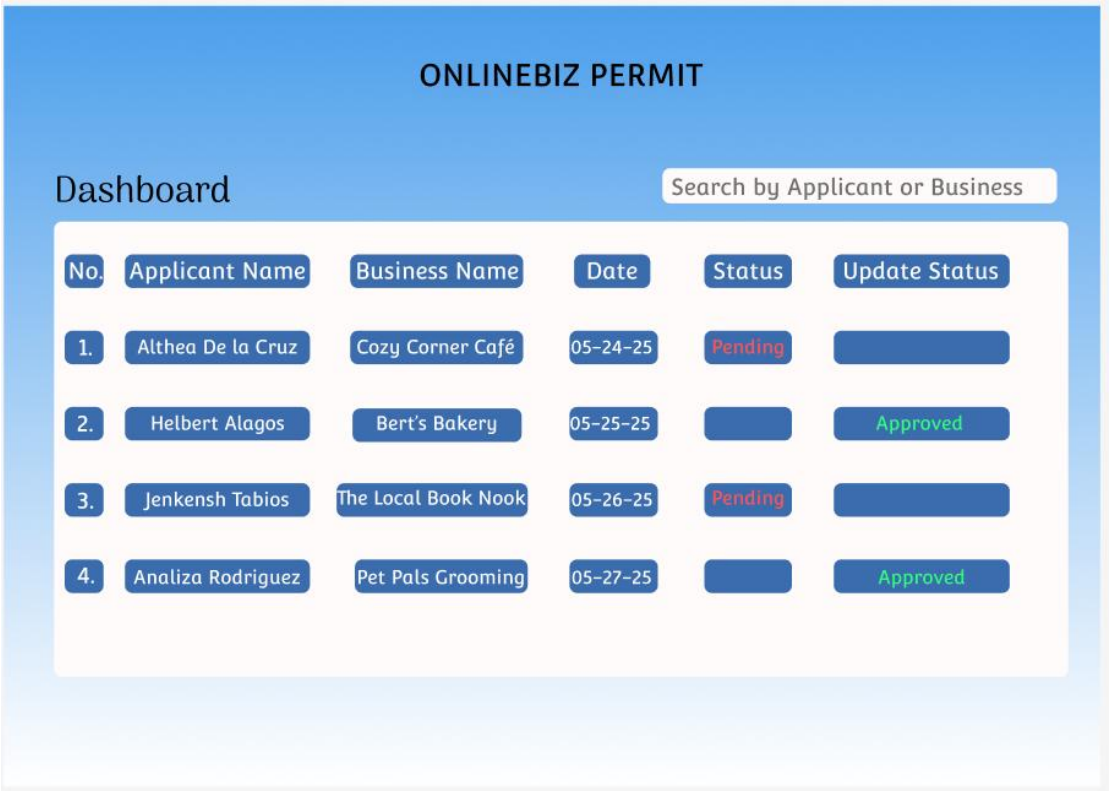

Figure 18. Dashboard

The image displays a dashboard from the ONLINEBIZ PERMIT system. It shows a list of business permit applications, including the applicant's name, business name, application date, current status (Pending or Approved), and a button to update the status. There's also a search bar to filter applications by applicant or business name.

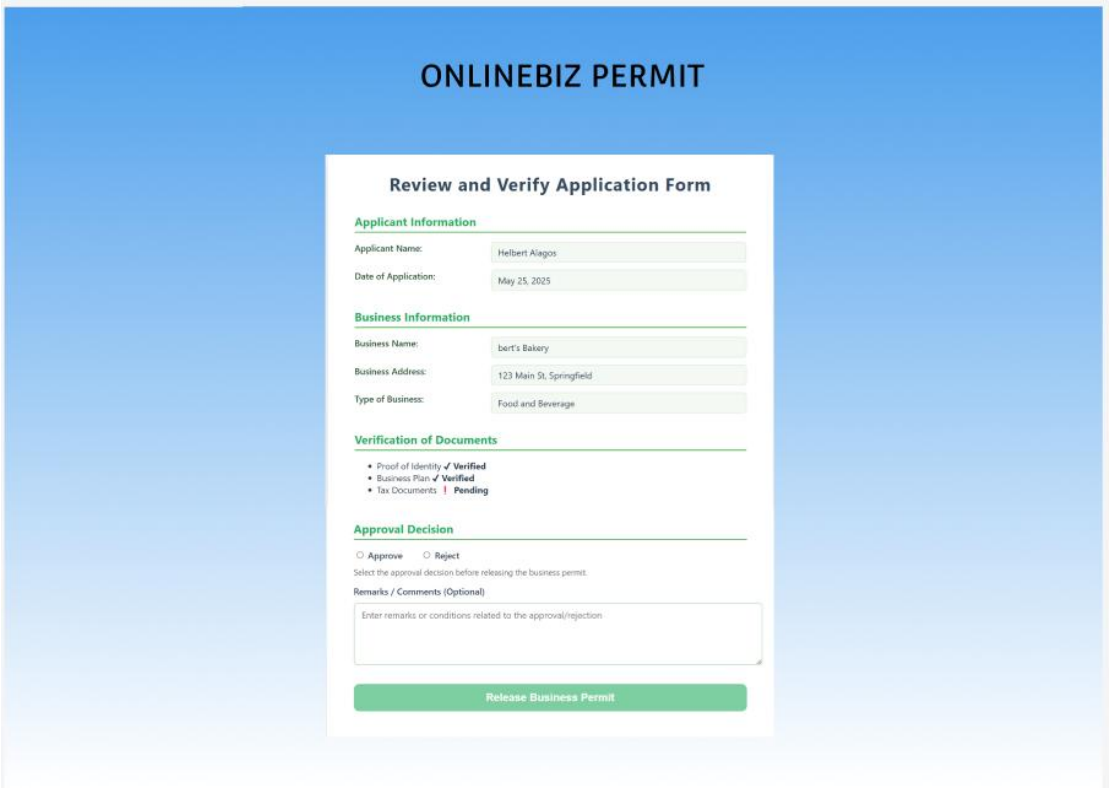

Figure 19. Review of Application Form

The image shows a review and verification form for a business permit application on the ONLINEBIZ PERMIT system. The form displays applicant information (Helbert Alagos), business information (Bert's Bakery), and the verification status of submitted documents. The reviewer can approve or reject the application and add remarks. A "Release Business Permit" button is present to finalize the process.

Development and Testing

Software Development Method

The researchers will use Rapid Application Development in developing the Online Business Permit Application and Tracking System. This method is perfect for projects that need flexibility and speed since it prioritizes rapid prototyping, user feedback, and iterative development.

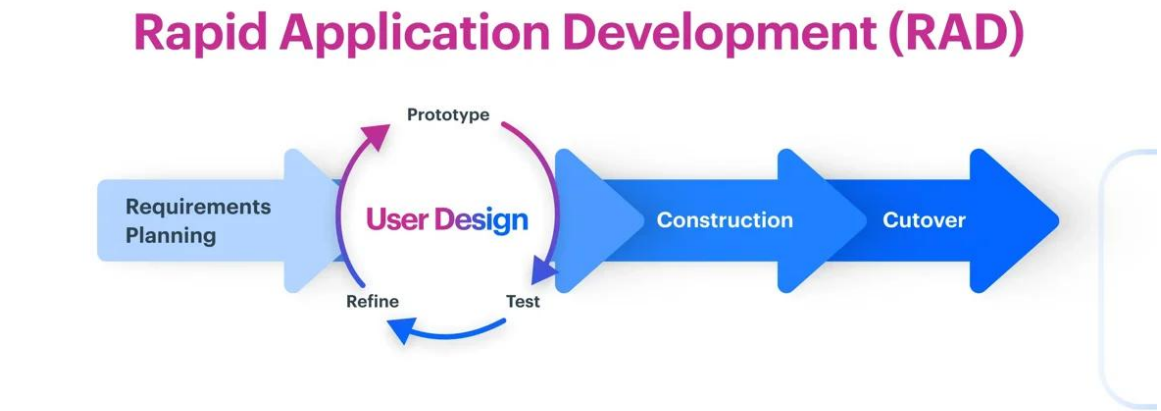

Figure 20. RAD Methodology

The Rapid Application Development (RAD) approach consists of a number of phases, such as requirements planning, user design, rapid construction, and cutover. Requirements planning it includes when the researchers conduct interviews in the LGU of San Miguel to gather data requirements, like existing process working with

stakeholders such as interviewing, holding workshops, and creating a project scope document. User design may includes mockups, usability testing, and feedback to polish the user experience when the researchers do this phase. This also creating a prototype of the system to present in the stakeholders for gathering feedbacks about the design. Rapid construction includes building the application in small, incremental steps, with emphasis on core functions, building the system using frontend (HTML/CSS), backend (PHP/JAVASCRIPT). Sprint meetings regularly evaluate progress and adjust accordingly. Cutover is data migration from current systems to the new application, user acceptance testing, and offering training sessions and support materials for users migrating to the new system. This approach is best suited to create the Online Business Permit Application and Tracking System. *HTTPS://kissflow.com/Hs-fs/hubfs/rapid_application_development_rad_.webp*. (n.d.)

Evaluation

The Online Business Permit Application and Tracking System is being evaluated to assess its effectiveness, usability, and alignment with project objectives. The evaluation aims to ensure the system meets user needs, delivers a seamless experience, and fulfills the goals of facilitating the online business permit application process. The Descriptive Survey Method will be employed to gather valuable data from end-users, stakeholders, and industry professionals. The evaluation will be conducted through structured questionnaires, in-depth interviews, and direct observation of user interactions. The goal is to gather quantitative and qualitative feedback, provide in-

depth insights into user experiences and challenges, and identify usability issues. The evaluation will provide critical insights to inform necessary improvements and ensure the OnlineBiz Permit system effectively serves its purpose.

Data Gathering Procedure

This section presents the step-by-step process of gathering data for the design and assessment of an Online Business Permit Application and Tracking System. The process involves the identification of primary data sources, the choice of proper data collection methods, scheduling, and adherence to ethical considerations.

Primary data sources are users, local government officials, stakeholders, existing documentation, and literature review. Secondary data sources are existing documentation, academic articles, case studies, and reports on similar systems and best practices in online permit applications. Data collection methods are surveys, interviews, observations, focus groups, and timeline development. Surveys will collect quantitative information from a large population of users about their needs, preferences, and experience of the existing permit application process. Interviews are carried out for the collection of qualitative information via detailed discussions with significant stakeholders, whereas observations are used to understand the existing permit application process and spot pain points. Focus groups allow users to discuss in order to get varied opinions about the features of the system as well as its usability. Scheduling data collection entails developing a comprehensive timeline for every data collection technique, assigning particular time slots for survey distribution, interview

scheduling, and observation sessions. Coordinating with stakeholders to arrange interviews and focus groups at convenient times and ensuring surveys are distributed during business hours to achieve maximum response rates. Ensuring ethical considerations is paramount, such as obtaining informed consent, confidentiality, highlighting voluntary participation, and seeking institutional review board or ethics committee approval. Once data collection is completed, the data are analyzed using the proper statistical techniques for quantitative data and thematic analysis for qualitative data. A report of findings will guide the design and implementation of the Online Business Permit Application and Tracking System. Through this organized data collection process, the research will be able to provide detailed and pertinent data that will help establish an effective and user-friendly web-based business permit application and monitoring system.

Respondents of the Study

This section outlines the study's participants, including Applicants, local government officials, and IT staff. Applicants must have applied for a business permit in the last year, while officials responsible for issuing permits and managing the tracking system must have experience. IT staff should have a relevant technical background and current involvement in the system. The sampling technique is stratified sampling, dividing the population into strata and randomly selecting respondents from each group to ensure adequate representation.

Formula:

Sample Size (n) = (N * n_i) / N_i

Where: n_i = Sample size for each stratum

N_i = Total size of each stratum

Table 8. Respondents of the Study

Type of Respondent	Total Population	Sample
LGU Staff	6	3
Applicants	100	50
Total:	106	53

Statistical Tool

This part presents the statistical tools and techniques utilized to process data in the Online Business Permit Application and Tracking System. Descriptive statistics are applied to summarize and describe the principal characteristics of gathered data, like user satisfaction scores and application duration. Frequency counts are applied to tally responses for categorical variables like business types and delays in application. Percentages are utilized to calculate the proportion of respondents who choose certain options in surveys.

Likert scale analysis is employed for measuring user attitudes, perception, and satisfaction levels towards the online business permit application system. Cross-

tabulation is employed to investigate the relationship between categorical variables, assisting in the identification of patterns and differences in user experiences. Inferential statistics are employed in making inferences about the population based on sample data. Data visualization is employed to display the data that has been analyzed in a clear and readable manner, employing tools such as bar charts, pie charts, histograms, and box plots. Data analysis is performed using statistical software such as SPSS, R, or Excel, which allows for the performance of tests, data visualization, and the creation of reports of the findings.

Scale	**Mean Range**	**Interpretation**
5	4.21-5.00	Excellent
4	3.41-4.20	Very Satisfactory
3	2.61-3.40	Satisfactory
2	1.81-2.60	Unsatisfactory
1	1.00-1.80	Very Unsatisfactory

Lastly, the examination of the gathered data will give meaningful information on user experiences, user preferences, and the overall success of the Online Business Permit Application and Tracking System. The findings will drive decision-making and shape improvements in raising user satisfaction and facilitating ease in the application process.

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