DEVELOPMENT OF A MID-LEVEL CENTRALIZATION MANAGEMENT SYSTEM FOR THE CITY OF MANILA

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Abstract

The study developed the "Mid-level Centralization Management System for the City of Manila”. The general objective is to streamline cross-departmental transactions of the City Hall of Manila and reduce inefficiencies processing applications and payments through digitalization. The developed web application was composed of two main modules: one for citizens and another for administrators. For citizens, it allowed them to submit applications and payments for different civic transactions such as Real Property Tax Payments and Tax Clearance, Business Permit, Community Tax Certificate/Cedula, and Local Civil Registry documents which were paid online via PayMongo. The system also featured scanning of QR code, interactions with an AI chatbot, application for verification, and management of profile. For the administrators, a centralized management platform was established which offers role-specific access privileges in the system. This enabled the admins to efficiently process transactions submitted by the citizens, view dashboard, and generate reports. The system was developed using various tools such as Visual Studio Code, frameworks like React.js, backend tools such as Express.js and Node.js, and a database system managed with MySQL Workbench. APIs were also integrated including Firebase, PayMongo, IBM Watson Assistant, and Google SMTP. The system was evaluated by 30 respondents comprised of 20 IT Professionals, 5 Municipality Staffs, and 5 Ordinary Users using ISO/IEC 25010 for the evaluation instrument. The system obtained an overall weighted mean of 3.89 with an equivalent descriptive rating "Very Acceptable" which indicates that it met the requirements for functional suitability and security.

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- The Researchers

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

Chapter 1

THE PROBLEM AND ITS SETTING

Background of the Study

The rapid advancement of technology in the modern period has an influence on practically every aspect of our lives. Technology's widespread spans numerous fields, influencing our professional undertakings, leisure activities, communication channels, and core worldviews.

It is crucial to become aware of the wide-ranging effects of this worldwide technological spread as we move toward a future where technology is essential. Municipal systems and governmental activities are one of pivotal points in this complicated tapestry of global technological transformation (Marcos, 2021). Significant advancements have been made as a result of the digital revolution, including increased administrative effectiveness, service delivery optimization, and civic engagement. We can observe the substantial effects of digital innovation on community management and governance in this dynamic technological environment.

Competency and transparency of municipal governance are critical to increasing a community's prosperity and quality of life. Municipalities are significant organizations tasked to keep the city, provide services, and protect all of the persons residing inside their boundaries. As towns grow and take on more duties, the requirement for durable systems that maximize various activities like revenue collection becomes critical.

Based on the study “The right tools for digitizing government payments”. Improving payment practices can help improve government and municipality efficiency, public welfare, and economic activity. Governments can encourage financial inclusion by influencing how receivers receive payments, such as requiring payments to be made into an account or a pre-paid card. Digitizing government payments and collections can assist policymakers in achieving these objectives. (Sarkar, 2017).

Rapid digital transformation is increasing the demand for faster, easier, and data-rich business solutions. Local governments are likewise embracing this changing trend to meet the needs of their growing communities. As a result, several towns are looking for ways to transition into the future with updated payment solutions (Brick et al., 2021). According to the article Municipality Management System by (MultiFrames, 2023), implementing an integrated and comprehensive solution for municipal operations offers numerous benefits. It increases efficiency and effectiveness in day-to-day operations, improves decision support by integrating asset management data, and enhances service to constituents despite limited resources. The flexibility and affordability of starting with a few areas or implementing a comprehensive solution that spans all aspects of operations are advantageous. By integrating organizational data into a single, user-friendly database, the system enables easy access to information and empowers users with robust GIS capabilities. It facilitates faster insight into assets through map queries, improves interdepartmental coordination, and aids regulatory compliance. Streamlining communications, document management, and data maintenance results in more efficient work processes. The system provides a centralized point of access to integrated data and enables coordination with other departments. Additionally, it enhances output by generating high-quality maps and facilitating the preparation of standard reports quickly and easily.

The centralization of the municipal system aims to provide much better efficiency, convenience, and transparency. By implementing the system, municipalities can improve service delivery by simplifying their financial operations, improving the citizen experience, and optimizing resource allocation. The system is a significant advancement in modernizing municipal management, ensuring sustainable growth, and strengthening communities.

Objectives of the Study

The general objective of the study is to streamline the services and eliminate the time-consuming and exhausting way of processing city hall documents and payments through digitalization.

Specifically, it aims to:

1. Design a web application module for the end user with the following features:
    a. Citizens' user profile creation using mobile number, Google account, and Facebook account.
    b. OTP verification via SMS for citizens' login.
    c. Application for Real Property Tax including tax payment and tax clearance.
    d. Application for Business Permit
    e. Application for Community Tax Certificate or Cedula
    f. Application for Local Civil Registry documents such as Birth Certificate, Death Certificate, and Marriage Certificate

g. Download Statement of Accounts

h. Pay transactions online via PayMongo

i. Transaction history where users can see their past transactions.

j. QR code technology to provide details of a transaction when scanned by user.

k. User profile where user can view and edit personal, information, contact information, and government information.

l. System and email notification for the updates of the user's transaction and other relevant information.

m. Upload documents when filling out forms.

n. Apply for verification where user can upload valid ID.

o. Interact with AI chatbot.

p. User settings where user can change profile photo, change password, and delete account.

2. Design a web application module for the administrators with the following features:

   q. Provide an administrator centralization management platform where admins have different access privileges based on their designated modules. These admins include Chief Administrator, Registry Administrator, Real Property Tax Administrator, Business Permit Administrator, CTC/Cedula Administrator, and Local Civil Registry Administrator.

r. Input fees for Real Property Tax Payment and Business Pemit

s. Process or reject a transaction created by user and provide remarks when rejecting a user transaction.

t. Approve or reject user verification and view user list.

u. Add admins and view list of admins.

v. Audit Trail which tracks activity of all admins within the system.

w. Dashboard for each admin tailored according to their respective modules providing them relevant information based on user information.

x. Download reports based on the information generated by the admins' respective dashboards.

y. Archives containing completed, rejected, and expired transactions.

3. Create the system using various development tools such as Visual Studio Code, MySQL Workbench, Express.js, React.js, Node.js, and Git/Github. Additionally, integrate APIs which includes Firebase, PayMongo, IBM Watson Assistant, and Google SMTP.
4. Test and improve the system in terms of functional suitability and security.

5. Determine the level of acceptability of the system using ISO/IEC 25010 software evaluation instrument with the following criteria: functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability.

Scope and Limitations of the Study

Design and develop a web-based system called Mid-Level Centralization Management System for City of Manila with the following capabilities.

This study aims to design and develop a web-based system titled ‘Mid-Level Centralization Management System’ for the City of Manila. This system is intended to provide a platform for users to process their documents electronically while administering municipal administrators the capability to oversee and manage the services rendered by the system. The scope of this system is confined exclusively to the processes and services offered by the City of Manila, with its functionality limited to several services within the system.

The system is designed to streamline and centralize the process of Real Property Tax including Tax Payments and Tax Clearances, Business Permits, formal request of a Community Tax Certificate for individuals, obtaining certified copies of Birth Certificates, application of Death Certificates, and Marriage Certificates, enabling individuals to process payments, registrations, and applications of specified services. It is imperative to clarify that the system is only limited to these processes and does not support other types of civic transactions. On another note, PayMongo is implemented as the only payment gateway.

The system also grants administrators the capacity to generate reports based on the user's transaction data on an annual basis. These reports only include the information displayed on the dashboard of the admins. These include significant metrics such as number of transactions in each month of the year and according to transaction status, financial information, and user demographics. Additionally, the system also authorizes the Chief Administrator with the capability to manage audit trials. This process provides the Chief Administrator with the necessary documentary evidence of the sequence of activities within the system. Additionally, the Chief Admin can create new admins and view the list of admins in the system. It is imperative to clarify that these capabilities are not accessed by any entities aside from the authorized administrator and do not accommodate or provide information outside of the offered services within the system.

The system also establishes a platform that aims to assist users in the management and reviewal of the significant details of their transactions within the transaction history platform. The scope of this system is confined to providing users with a platform for monitoring and reviewal of the significant details of their transactions and to enable users to view and download their Statement of Accounts. Downloading a Statement of Accounts is only possible if the status of the transaction is labeled as "pending".

The system also authenticates the registration of new users by providing OTP verification via SMS. The dissemination of information associated with the status of user transactions is through the email provided by the user. Scanning the QR code provides the details about the transaction made by the user. This technology is confined to providing relevant information about the transaction such as date processed, personal details of the transactor, financial information, and the status of the transaction.

The system also provides an Artificial Intelligence (AI) chatbot to offer immediate assistance to users, addressing their inquiries regarding the services provided by the system. The scope of this feature is confined to providing immediate assistance to users with the information regarding the system's offered services. It is imperative to clarify that the feature is limited to providing information regarding the system's offered services and does not provide other information out of scope of the system's services.

The system also establishes a user personal profile platform which can be viewed and edited by registered users. The scope of this platform is confined to providing registered users a platform to configure their personal information, contact information, and government information. It is imperative to clarify that the platform is limited to configuring user's personal information.

The project takes place solely in the city of Manila. Data is collected from several departments of the city government as well as relevant stakeholders. The respondents include 20 IT Professionals, 5 Municipality Staffs, and 5 Ordinary User. This ensures that the evaluators of the system are the service recipients and are knowledgeable about the service provided by the web application.

This project is subject to several potential limitations. Foremost, among these is the complex and strict ordinance for the information of the processes within the City of Manila, which may limit our access to the knowledge and data necessary for the system's development. City ordinances, rules and regulations, and data privacy imposed by the city hall should be acknowledged in the creation of the system. Additionally, the outcomes of data collection and system testing may be influenced by the municipal staff and professionals, which, in turn, may necessitate modifications to our project timeline and project scope. Moreover, the issuance of Real Property Tax Clearance, Business Permits, CTC/Cedula, and Local Civil Registry documents such as Birth Certificates, Marriage Certificates, and Death Certificates are not provided by the system. Claiming of the said documents requires the physical presence of the requestor in the Manila City Hall. It is also important to clarify that the system does not provide electronic copies of the said documents. Lastly, the project is limited to developing a web-based system and does not support technologies outside of the scope of the system such as hardware technologies and apparatus.

Chapter 2

CONCEPTUAL FRAMEWORK

This chapter presents related literature and studies that the researchers have used to support and serve as valid bases of the study.

Review of Related Literature

Centralization Management System

According to Ford (2023), property managers can save time and money through centralization, particularly by using online payment solutions. The report underscores the benefits of centralizing key property management functions, such as tenant services and property upkeep, to enhance tracking and oversight, ultimately improving operational efficiency while controlling expenses.

Centralized management attributes can, in the meantime, provide you with the means to define the management dynamics in your workplace and improve your understanding of how it can positively impact your success (Indeed, 2022). Centralized management involves the exclusive delegation of planning and decision-making authority to the top executives of an organization. Its main features include the significant involvement of high-level management, a concentration of decision-making at the upper levels, and a structured framework tailored for smaller organizations.

According to MasterClass (2022), a centralized management system offers several advantages. It facilitates swift decision-making with reduced need for prolonged discussions or disputes, streamlines business procedures by cutting down on the time spent in developing and documenting decision-making processes, and minimizes the effort required for standardization in lower-level management systems. Additionally, centralization is conducive to fostering a shared vision and a unifying sense of purpose within the organization, simplifying the alignment of its objectives.

In their 2022 work, Uster and Cohen delve into the delicate balance between centralization and local autonomy. Nevertheless, there is a scarcity of studies that critically examine how local authorities react when they are dissatisfied with policies coming from the central government. The results of their research shed light on the dynamics between local and central governments, underscoring the "do-it-yourself" approach. While this approach has the potential to bolster political participation and increase the local government's role in public policy, it also opens the door for local stakeholders to engage in activities of questionable legality. To address this, decision-makers at the central government level could take measures to curb such behaviors, which would result in the strengthening of administrative institutions, improved regulatory enforcement, and the enhancement of local autonomy, political culture, transparency, and integrity.

Centralized Payment System

The benefits of a centralized payment system are numerous. First, they stress how convenient such systems are for merchants because they are simple to integrate and manage. They can provide merchants with a variety of options, enabling them to choose solutions that meet their needs. Additionally, especially in small organizations, payers frequently find it simpler to administer the centralized system than receivers. The authors also point out that established payment methods are advantageous for centralized payment systems since they reduce the need for technical support and troubleshooting. However, there are drawbacks as well. Being trustworthy is a major concern since the centralized nature of these systems leaves them open to unauthorized changes or data tampering. The study's cost analysis shows that centralized solutions are typically more expensive than decentralized ones, which is another important disadvantage. A frequent issue is the delay in payment receipt, with manual processing contributing to lengthier processing times. Large-scale organizations that handle high payment volumes and a variety of payment methods may find this delay to be particularly bothersome. The literature also raises questions about the security of finances, arguing that larger organizations may not always be adequately protected by centralized methods (Hossain et al., 2020).

Jackson's (2023) study on centralized workforce management systems complements this theme by discussing the advantages of centralization in staffing management activities. It emphasizes how centralization can simplify processes and reduce errors that result from manual data transfer between systems. Centralizing data from various aspects of workforce management, including payroll, scheduling, compliance, and more, can lead to greater synergy across systems.

Small business proprietors may prefer a decentralized approach to company management, particularly when their operations heavily rely on employee creativity. With decentralized control, employees can actively engage in a more democratic structure, collaborating on refining ideas to enhance processes and products before presenting them to the business owner, as discussed in Bianca's 2019 article.

Local government transaction management has risen to prominence in the field of public administration in recent years. The processing of numerous activities and services that local governments offer to their citizens, such as tax collecting, permit issuing, public services, and more, is referred to as transaction management. In the past, these activities were frequently spread out among several divisions or units within local government entities, which resulted in disjointed data and workflows. In the first place, centralization is seen as a potent tool for simplifying procedures. Local governments may get rid of overlaps and redundancy by combining various transaction activity. For instance, a centralized system can act as a single point of data collection and administration rather than several departments gathering and storing the same data. This consolidation streamlines the procedure and cuts down on inefficiencies and operating expenses (Smith, 2017).

The case study focuses on the initiatives taken by New York City to consolidate transactional procedures within the municipal administration. A difficult task, transaction management involves different functions including tax collecting, permits, and licensing in a metropolis as big and complicated as New York. In the past, these tasks were frequently handled by several departments and organizations, which might result in inefficiencies, incorrect data, and a lack of coordination in the provision of services. For other municipalities confronting comparable difficulties, New York City's effective centralization of transactional operations serves as a role model. It shows that centralization may result in significant benefits in productivity, data accuracy, and service quality even in big, complicated metropolitan areas. The case study also highlights how important it is to use change management techniques and technological investments to successfully make the switch to a centralized system (Harris, 2020).

Factors such as the benefits, user-friendliness, and individual confidence significantly influence how consumers perceive and adopt e-payment services. Interestingly, even though trust and security show a strong correlation, they do not significantly impact consumers' perceptions. Enhancing the advantages, usability, and self-assurance associated with e-payment systems, as recommended by Alyabes in 2018, can promote better consumer perception and adoption.

Payment systems play a crucial role in enhancing transaction efficiency and facilitating cross-border digital service sales. The COVID-19 pandemic has underscored the importance of digitized tax administration for the safety of tax authorities and taxpayers, as well as efficient tax collection for economic recovery. However, challenges like internet connectivity, reliable payment infrastructure, and public attitudes toward digital payments need to be addressed for successful implementation. Overcoming these challenges is essential to maximize the benefits of centralized payment processes and ensure efficient tax collection in municipalities ("The Role of Payment Systems in Philippine Tax Administration," 2020).

E-Government Website Features

It stated that eGovernment initiatives offer governments a fantastic opportunity to provide better and faster services to their users from the public in the age of information and communications technology. However, several crucial factors, including website usability, play a significant role in whether these projects succeed in meeting their objectives. The purpose of their study is to assess how usable Taiwan's present e-government websites are. The findings show that the target e-government websites have a variety of usability issues. These findings can direct designers' focus toward developing more usable e-government websites by assisting them in identifying the usability requirements of users (Chang & Almaghalsah, 2020).

The drawbacks associated with e-government encompass issues such as unequal accessibility to the internet, information reliability, concealed government motives, excessive surveillance, financial implications, and restricted access for specific demographics. These potential disadvantages, including unequal internet access, information reliability, hidden government agendas, heightened surveillance, financial concerns, and limited access for certain groups, should be carefully considered (E-Spin, 2023).

Online Government

Government services have typically been provided in person, by several departments at various places, and frequently using paper forms. Government can now provide citizens with information and services whenever, whenever, and on any platform or device thanks to digital services. Benefits of switching from traditional to digital services for corporations go beyond service provision. Government employees are no longer restricted to a phone or service desk, which frees them to think and act strategically on other projects. For instance, they could spend time enhancing hiring and recruitment procedures, optimizing backend procedures, and implementing technology standards (Granicus, 2023).

According to Kumari (2023) “the government provides services online to make it more convenient and accessible for citizens to access important services. By offering services such as filing taxes, applying for benefits, or checking the status of applications, the government can make these services more efficient and reduce the need for physical visits to government offices. Additionally, providing services online can also help to reduce costs for the government and taxpayers”.

Based on the article made by The Digital Economy (2018) “For governments, this divide could hamper their well-intended digital-transformation efforts. It is hard to justify spending tax-payer money on initiatives that benefit only part of the population - or even worse, only those at the top of the pyramid who can afford 24/7 connectivity. Pre-paid mobile is the most popular way to connect to the internet, accounting for more than 75% of mobile users in Africa, Asia and Latin America. But when users run out of pre-paid credits, they cannot access digital government services on their phones”.

There are numerous factors that should be considered when choosing a payment system for local government transactions. Security is essential for the system to protect sensitive information of users. Usability should also be taken into consideration since a simple and streamlined user interface will reduce errors committed by the user and will make the process of payment more efficient. Mobile compatibility is also an important feature since it is notable that there is a large number of citizens who use smartphones to do their financial transactions (Fisher, 2023).

Benefits of Online Government

There are hundreds of websites owned by various governmental departments and groups among the approximately 2 billion websites available today. Unfortunately, local governments may not leave a favorable first impression on individuals who visit their website if they have been reluctant to modify and update it. This is only one of the key benefits of having a successful government website. A government website's primary goal may be these two things, and effective websites excel at both (GovOS, 2023).

E-government makes important strides toward updating bureaucratic procedures for the internet era. E-government technologies can also greatly enhance communication within government agencies and between levels of government. The needs of the government can readily be met by cloud-based tools. This offers a single, unified platform where trustworthy data and efficient communications virtually eliminate errors and duplications. The majority of the benefits connected to private-sector CRM are equally applicable to e-Government. The ideal template for this has already been given by the business sector (Apkarian, 2022).

A global network connecting computers and networks is known as the internet. It enables communication and information sharing over large distances. The internet offers several advantages, such as messaging services like WhatsApp and online shopping. Along with leisure options like online games and movies, it also provides self-improvement through online classes. Additionally, it helps government organizations offer the general public services that are quicker and more convenient (Surya, 2023).

It is important for citizens to pay and complete their transactions on time. Integrating a payment gateway for local government allows citizens to pay their transactions on time, eliminating the chances of missing their payments. The Reserve Bank of Australia reported that in 2019, around 50% of all Australian households paid their bills online which is the doubled number of households compared to the report in 2013 (Melton, 2022).

Implementation of MySQL, Express, React, Node, & Visual Studio

In the software development domain, technology and tools assume a central role in the creation of efficient and user-friendly applications. Node.js and React.js, as elucidated by Simplilearn in 2023, exemplify two distinctive yet complementary technologies. Node.js takes on the primary responsibility of managing the backend of applications, functioning as a JavaScript framework for robust construction. Conversely, React.js is exclusively dedicated to the development of an immersive and responsive user interface, shaping the front end of the program. Despite their divergent roles, both these technologies collaborate to enhance the speed and user-friendliness of applications.

Furthermore, within the collaborative landscape of software development, developers frequently come together to address coding projects and rectify errors. They commonly rely on robust platforms like Visual Studio, a versatile development tool that streamlines the entire coding process within a unified environment. As highlighted by Murali in 2023, Visual Studio enjoys a well-deserved reputation for its exceptional capacity to identify and resolve coding errors. It empowers users to generate high-quality code, offers access to a diverse array of testing tools, and comes equipped with additional coding features. Furthermore, it facilitates real-time collaboration, effectively mitigating redundant work and bolstering the overall efficiency of software development initiatives.

MySQL stands as a widely embraced open-source SQL database management system, developed, distributed, and backed by Oracle Corporation, as detailed in Christudas' 2019 publication. It excels in the management of structured data collections. Within a MySQL database, you can seamlessly add, retrieve, and manipulate the stored data, which is organized into distinct tables. These database structures are optimized for enhanced performance and efficiency. The logical model of MySQL, featuring components like databases, tables, views, rows, and columns, provides a flexible programming environment.

In the meantime, Express.js serves as a rapid, unbiased, and streamlined web framework designed for Node.js, offering a comprehensive array of capabilities for both web and mobile applications. Express.js is highly adaptable, empowering developers to craft applications tailored to their specific configurations and demands. According to Kumar (2023), the primary strengths of Express.js lie in its straightforward and user-friendly nature. This stems from its minimalist framework, which intentionally lacks an extensive array of pre-built features. Such simplicity enables developers to selectively incorporate only the necessary components, culminating in a more streamlined and agile application.

Related Studies

Online Systems

The research conducted by Whitell et al. (2020) highlights the use of electronic permitting (e-permitting systems) of municipalities in Ontario, Canada. As Ontario's municipalities expand and experience higher population densities, managing the growing number and complexity of building permits has become increasingly challenging. They introduced e-permitting systems, which use technology to make the permitting process easier. Moreover, it demonstrated the potential to enhance efficiency, accelerate permit processing, improve transparency, and optimize document reviews and revisions. In addition, modern e-permitting systems can combine building information models (BIM) and geographic information systems (GIS) to help with smart city planning and management. However, the diverse landscape of Ontario, encompassing 440 distinct municipalities, presents a significant challenge due to the absence of standardized practices and information sharing methods. Consequently, the widespread adoption of e-permitting systems becomes laborious. By analyzing a real-life case of permit handling in an Ontario city, their study reveals invaluable insights that can serve as a reference for other municipalities wanting to implement electronic permitting systems.

Municipal Digitalization

Municipal digitalization is increasingly prevalent, driven by a desire among many cities to leverage digital technologies for achieving their environmental objectives, as highlighted by Ringenson et al. (2018). Despite this, there remains a notable gap in understanding how to effectively implement these digital solutions among both municipalities and information and communication technology (ICT) developers. To address this knowledge gap, the authors organized workshops and conducted a review of relevant literature to ascertain the advantages of employing digital technology. They also studied two European Union directives intended to help local environmental goals and linked their usage of digital technology with the actions and objectives described in these directives. They propose a systematic approach that can be applied to any city plan, involving two key steps: (1) Identifying the objective, which is typically determined by EU directives or other relevant guidelines. (2) Determining the activities necessary or generated to achieve the established objective. This approach not only aids cities and municipalities in understanding how digital technologies can facilitate their goal attainment but also helps in devising effective strategies for their implementation.

Kalinichenko et al. (2021) undertook this research with the aim of enhancing municipal administration by highlighting municipal services as a cornerstone of local self-governance. The study underscores the importance of state and local governments adopting systematic scientific methodologies and devising fresh criteria to support local government personnel in fulfilling their community obligations. Additionally, the research delves into the potential of digital technology in elevating the efficiency of local government operations, considering these emerging digital tools as pivotal in fortifying the scientific and informational foundation of local management practices. To enhance overall efficiency, the study recommends the digitalization of both state and municipal government activities.

Abramitov and Dneprovskaya (2021) emphasized the importance of local governments giving top priority to providing online services to their residents. This shift holds great significance due to the manifold advantages it offers, and online services are increasingly varied and accessible to a broader population. They particularly highlighted the utilization of the "Unified portal of state and municipal services (functions)," managed by the Ministry of Digital Development. This information system streamlines the electronic delivery of municipal services. Abramitov and Dneprovskaya underscored the essential understanding that people prefer electronic services for their convenience, particularly when dealing with government agencies or service providers. To ensure that these tools are user-friendly, it is crucial to clearly define the requirements for service operations in laws or regulations. These requirements should encompass elements such as user-friendly interfaces, convenient identification and authentication methods, effective navigation and search features, as well as comprehensive information regarding available services, especially within specific life situations.

Chatterji (2018) pointed out that India's new urbanization plan has a primary goal of enhancing data, services, and communication within cities through technology. These initiatives entail collaborations among government bodies, corporations, and international entities to foster digital advancements. However, this technology-driven approach faces challenges due to the digital divide, where some individuals have access to technology while others do not. Additionally, local government units in India have been overlooked, resulting in ineffective management and a shortage of IT expertise. Chatterji argued that, for the urbanization plan to thrive, city administrations must proactively employ electronic tools for governance; otherwise, they risk ceding control and limiting public participation in local decision-making.

Diegtiar et al. (2020) explore innovative approaches to enhance the information and communication system of Ukraine's local government. The research aligns with the objective of centralizing city hall operations, as centralization often involves making information management and communication more efficient. The concept of creative municipal management corresponds with the goal of centralizing city hall procedures, emphasizing the use of inventive methods to enhance service delivery, resource management, and community welfare.

Malodia et al.'s (2021) study emphasizes the absence of a holistic perspective in comprehending the field of e-government. Identifying this deficiency offers an opportunity to explore and amalgamate different facets of e-government, including customer-centric approaches, channel-focused strategies, and technology-driven elements. This insight can guide the establishment and execution of streamlined procedures within municipal government structures.

In their 2018 study, Manoharan and Ingrams delved into the use of information and communication technology (ICTs) by governments to streamline internal procedures and improve service delivery. This resonates with the goal of centralizing city government functions, as centralization frequently entails leveraging ICTs to refine and augment the efficiency of internal processes and the provision of services.

The 2020 research by Liwanag and Wyss delves into the Philippine government's pivotal decision in 1992 to delegate greater authority to local governments for healthcare delivery. Public satisfaction with the outcomes of this devolution of power has evolved over time. To unravel the intricacies of this transformation, the study employed surveys to collect insights from research participants encompassing a range of domains, including planning, healthcare financing, resource management, human resources for health, healthcare service provision, and data management and monitoring. A noteworthy portion of the survey respondents expressed support for re-centralization. The interview findings suggest that these preferences likely stem from the belief that re-centralization holds the potential to address concerns related to the perceived politicization of decision-making and the local governments' dependency on central support.

The research of Nita ang Goga (2018) focuses on analyzing the strategic management system in the local public administration. The study also outlines the main aspects characterizing organizational management and strategic planning. This aligns with the system as centralizing government processes often involves strategic planning and management to improve efficiency, effectiveness, and overall performance.

According to Yusop et al. (2019), the current system is less open, which might lead to mismanagement between cops and offenders. By creating systems that give clear standards and standardized procedures, centralizing local government processes can increase openness and accountability while limiting the possibility for mismanagement or corruption. The paper also suggested a comparison study, which involves comparing multiple methodologies or systems to find the best solution. This comparative study can provide useful insights into best practices and lessons gained from different contexts, which can assist inform the creation and implementation of your system for centralizing city hall processes.

Mahula et al. (2022) investigate different technologies for enhancing local government processes. It focuses on the digital transformation (DT) activities of Western European local government organizations, notably their experimentation with blockchain technology. The authors conducted a multi-case study in three municipalities to explore the DT procedures and outcomes connected with blockchain adoption. The overall purpose of this article is to provide insight into the DT procedures utilized by local government organizations, with a focus on the adoption and experimentation of blockchain technology. It enhances understanding of how local governments use blockchain to better operations and services while dealing with technological developments.

Verkijika and De Wet's (2018) thesis looks at the usability of e-government websites in Sub-Saharan Africa (SSA). This region has the least developed e-government development. The study looked at 279 e-government websites from 31 SSA nations. The outcomes of the survey found that the majority of the SSA's e-government websites are difficult to use. The websites' total usability scores ranged from 36.2% on average to 64.8% for the highest-scoring website. This suggests that utilizing and navigating the websites correctly is challenging.

In their 2020 research, Nani and Ali evaluated the impact of many components such as strategy, technology, organizational aspects, human resources, and the environment on the adoption of electronic procurement (e-procurement) among Indonesian local government agencies. Their main goal was to see if introducing e-procurement will promote accountability, transparency, efficiency, and effectiveness in various government departments. They conducted an extensive investigation, gathering data from 96 procurement services, and discovered that well-defined strategies, integration of various organizations and systems, and enough human resource support were crucial in achieving these improvements.

Many services and solutions were presented. One can get the conclusion that many municipal governments do not give their web presence significant consideration. In order to save money and time in the future, the author advises city governments to specify their services in detail and decide how to make them available online such judgments ought to be supported by documented analysis that links the objectives and the techniques employed (Schmuk, 2021).

Digitalization of Payment Process

The effect of economy to transition, adopt, and use digital payment systems instead of going into manual processes is very beneficial according to the conclusion of Baghla (2018) even though it faces different challenges such as lack of knowledge and awareness of the public can be a hindrance to the adoption of digitalization of payments, many people still choose to use digital payment methods because according to their respondents, they shift through digital payments because it offers benefits such as having not to carry huge cash, cashback offers, easy and fast way to make payments, easy to track the record of payments, 24/7 transfer, discounts and reward points, and time saving.

The City of San Marcos one City that will gain great benefits when payments are centralized. Even though they have a payment software system which is called “Payment Central”, it is not yet deployed to all departments. It was found out that digitalizing processes of their local government can lead them to greater service delivery and will enhance their fiscal sustainability. The City of San Marcos “Payment Central” shows the opportunity for a more advanced technology in terms of payment systems. Their payment system has the potential to reduce the margin of errors committed by manual processing, convenience of transactions will be greatly experienced, and will smoothen the manual processes. The instance of the City of San Marcos is a reflection of a number of findings in this study, which is to address issues of manual processes, and to enhance service quality that the city government can offer (Beutler et al., 2020).

An alternative solution to pay national road tax with the use of blockchain technology is proposed to improve the emphasized time and cost inefficiencies that are interconnected with the traditional payment processes. It is also accentuated to the security concerns traditional payment systems have that can be a threat to the user's information and their data protection. Efficiency and security are a very important focal point of payment processes that need to be focused on in terms of improving. The importance of accessibility in having your payment processed anytime 24/7 is also crucial for taxpayers in different locations and time zones (Zinca & Negrean, 2018).

According to the study conducted by Lailiyah and Sebayang (2020), e-Billing systems have two categories in terms of constraints: internal and external. Internal constraints talk about the lack of technological proficiency and the lack of accuracy in handling tax-related activities. On the other hand, External constraints is something that is beyond from the control of the taxpayers themselves such as facility limitation, server downtime, and the internet connection instability. E-Billing systems effectiveness is not the only thing affected by these said constraints but also the affects the experiences and outcomes of the taxpayer. Understanding the obstacles needed to be faced by the taxpayers and the constraints of e-Payment systems is very important in considering the implementation of centralized payment systems. To improve the effectiveness of e-Billing systems, it is recommended that system quality should have increased attention by the relevant authorities. Minimizing system downtime, putting deadlines of payment based on the type of tax to be paid, and enhancing the socialization efforts among taxpayers are proposed to address to improve the overall e-Billing system payment experience.

It is important to select the right technology in ensuring the cost-effectiveness and efficiency while considering the potential trade-offs that are related to decentralization. The research of Hlaing and Nyaung (2019) shows the decrease in transaction costs and improvement in efficiency. Nevertheless, the study also raises the potential negative effects due to the storage mechanism that is used in their proposed system.

India experienced a great transformation following the demonetization initiative of their government. This policy shift required individuals in India to adopt methods of digital payments since there is a lack of alternatives. The increased use of the internet, mobile penetration improvement, and government initiatives such as “Digital India” became a catalyst for the aggressive growth of digital payments in India. The findings in the research paper of Singhal (2021) raises the importance and applications of digital payment services in India. These digital payment services include transactions through digital modes without the use of physical cash and these transactions are done online offering convenient and instant payment solutions. Compared to cash transactions which require payees to withdraw cash and visit banks on-site, digital payments revolve around the transfer of money from the account of the person who will pay to the payee’s account instantly.

The introduction of online payment systems especially the one in Muntinlupa, Philippines, shows the great shift towards transparent and efficient governance. In alignment with the national directives and ordinances, Muntinlupa City launched its online tax payment facility. The City of Muntinlupa is not alone in this adoption of online payment systems because other LGUs in the National Capital Region also initiated similar systems just like one in Manila City called “Go Manila,” an application that can be used to pay such as real property tax online, Caloocan Online Payment, QC E-Services, Marikina Online Payment Portal, etc. The shift towards online tax payment systems has a large scope of implications for both the government and its taxpayers. Muntinlupa City's online payment facility called "BeST" addressed the past challenge of the pandemic and the lockdowns associated to it. This online payment system introduced a new extent in terms of efficiency, convenience, and safety in conducting government transactions (Vibora & Mandigma, 2022).

Paul et al. (2021) proposed smart metering system include a web application to monitor and analyze information to monitor their information and gain control over their energy consumption expenses. The smart metering system proposed is realized to be cost-effective and economically viable. The adoption of smart metering eliminated most of the challenges that are associated with traditional reading metering. On the other hand, smart meters are accommodating in prepaid and postpaid billing systems that is very beneficial to the convenience of its customers.

Traditional approaches of paying essential services such as electricity, water, and property taxes have been defaced by their routine nature that results users for their payment to be delayed because of the tediousness of the process. Traditionally, customers are required to go to on-site payment centers to pay for their bills which is inconvenient, making users have a hard time tracking and managing their payments. A web application proposed to have three main domains for electricity bill, water bill, and property tax payments are eyed to eliminate the tedious process associated with traditional approaches in paying bills and services (Ranjitha & Chethana, 2019).

Use of the Internet on a Local Government

According to Bent (2016) “The purpose of this study was to examine how municipalities are using the Internet to "open" local government. Traditionally, local government has, for the most part, been more open than other levels of government. Furthermore, increases in the size of local government have also necessitated re-evaluation of the ways in which municipalities provide information to the public. The opportunity to disseminate large volumes of information and to increase public access and public participation have been the forces driving municipalities to establish a presence on the Internet”.

Based on the study conducted by E-governance (2018) the local level, e-governance and the appropriate use of ICT can boost and assist social and economic development, especially in terms of empowering officials and municipal representatives and providing links, networking, timely, efficient, transparent, and accountable services. E-local governance refers to utilizing ICT to improve public service accessibility, quality, and cost-effectiveness as well as to help revitalize the relationship between customers, citizens, and the public entities that work for their benefit. The development of the information society is largely a concern of local governments because they are closer to the people than central governments. It is a significant difficulty to provide those services in a traditional manner and alongside e-services as municipalities offer new, wider varieties of services for citizens after decentralization. According to a European study, local governments in developed nations are offering up to 77% of public e-services. Often local government portal is the first stop to reach also central government services.

ISO/IEC 25010

ISO/IEC 25010 is a quality model used to evaluate the whole quality and the quality of each characteristic of a software/system. It is an effective standard to evaluate the satisfaction to the needs of its users. The ISO/IEC 25010 is made of 8 characteristics used to evaluate a system/software. These are functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability. These main characteristics contain sub-characteristics that is used to help define the main characteristic. All these characteristics are the basis used to evaluate the quality a software/system has (Cederlöv & Hagman, 2021).

Conceptual Model of the Study

Figure 1 shows the conceptual model of the study which outlines the flow of the research and development. The input enumerates all the requirements such as knowledge, software, and hardware requirements which are necessary for the development. In the process, it shows a series of models and diagrams which represent the operations of the development. Lastly, the output is the Mid-level Centralization Management System for the City of Manila, which is then evaluated.

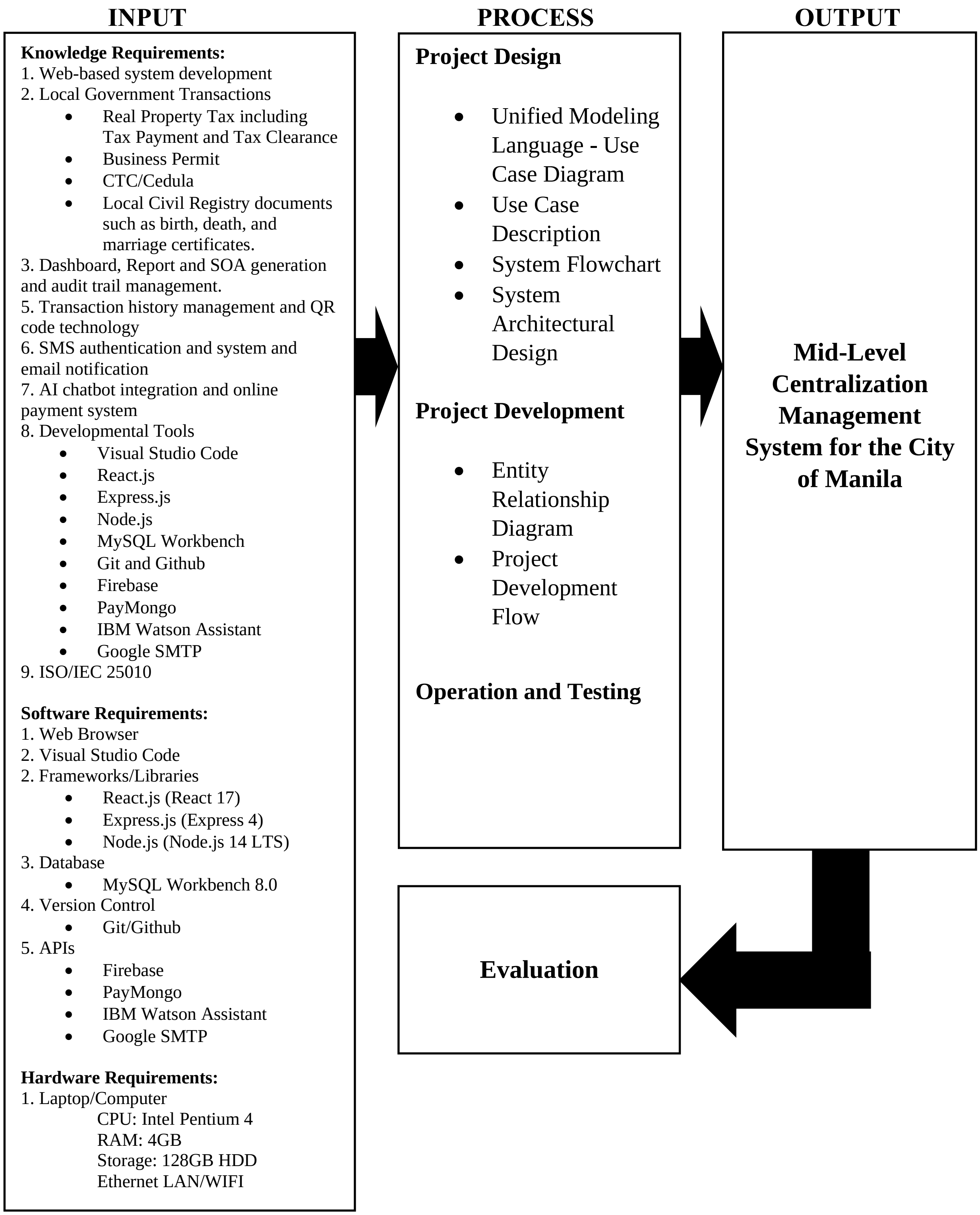

Figure 1. Conceptual Model of the Study

Operational Definition of Terms

To facilitate understanding of this study, the following terms are clearly defined:

AI Chatbot refers to an artificial intelligence that provides users an immediate assistance for information about the services offered by the system. It is an interface where the user can interact through chat regarding their inquiries.

Audit Trails refers to the detailed history of activities within the system such as service transactions and data changes by the administrators to provide documentary evidence of all operations occurring within the system.

OTP refers to an acronym for One-Time-Password that is a part of the SMS feature that will verify and authenticate the credentials of users within the system.

QR code refers to an acronym for Quick-Response code that provides a reference to users which contains all the information about a transaction.

RPTAX refers to a module or service within the system that processes tax transactions such as tax clearance and tax payments regarding Real Property.

Generate Reports refers to downloading a file that contains combinations of financial information, user demographics, details of transactions, and monthly statistics. This could only be downloaded by the administrators.

SOA refers to an acronym for Statement of Accounts. It is a document that can be downloaded by the user, containing detailed reports summarizing the financial information specifically the outstanding balance that the user must pay.

Chapter 3

METHODOLOGY

This chapter presents the project design, project development, operation and testing procedure, and evaluation procedure of the study.

Project Design

The project design of the study is outlined below using Unified Modeling Language (UML) – Use Case Diagram, System Flowchart, and System Architectural Design to visualize the design and flow of the Management System.

Unified Modelling Language – Use Case Diagram

The UML Use Case diagram of the developed system is divided into two: Client Use Case diagram and Admin Use Case diagram. This is to highlight the interaction of the actors and the use cases in the perspective of both Client and Admin when using the system.

Figure 2 displays the Client Use Case diagram of the web application. It has three actors namely: unregistered user, unverified user, and verified user. Each actor has a different access privilege in the system. To start using the web application, an unregistered user must register using his mobile number where an OTP verification via SMS is sent to authenticate the registration. If a mobile number already exists in the system, then the user is not permitted to register the same number. Upon registering, the unverified user now has access to the account where his interaction to the system is limited only in viewing the homepage, interacting with the AI chatbot, view and edit user’s profile information and change account settings. Once he applied for verification and have accepted by the admin, he is given the privilege to process Real Property Tax including Tax Payment and Tax

Clearance, process Business Permit, request CTC/Cedula, request for private documents on civil registry such as: birth certificate, death certificate and apply for marriage certificate. If the user submitted a form for Real Property Tax Payments and Business Permit, the user must wait for the admin to process the request to identify the outstanding balance of the user. If the transactions are CTC/Cedula and Local Civil Registry, then the user can pay for the transaction automatically. The user can also view his past transactions by viewing his transaction history. As the user views the transaction details, it displays the information he filled out in form. Also, a QR code is available so that when scanned, it provides the user with the details of the transaction. When the status of the transaction is pending, the user is eligible to download the Statement of Accounts of that transaction. Consequently, the user can pay for the transactions made. Furthermore, PayMongo is the payment method for the transaction and the receipt is sent through email. The user can also view the system notifications and email to check the status of the transactions. If the user signs out and wishes to login again, the user can login with mobile number and password, Google account, and Facebook account.

Figures 3 and 4 display the Admin Use Case diagram of the web application. It has six actors namely: the Chief Admin, Registry Admin, Real Property Tax Admin, Business Permit Admin, CTC or Cedula Admin, and Local Registry Admin. Once they login, the system distinguishes their specific admin role based on their login credentials. Each admin has different access privilege and perspective when using the system. The registry admin can view the details of the users in the user list and verify the users who applied for verification. Specific admins like RP Tax Admin, Business Permit Admin, CTC or Cedula Admin, and Local Civil Registry Admin can manage the transactions such as RP tax transactions, business permit transactions, CTC/cedula transactions and local civil registry transactions respectively. Meanwhile, the Chief Admin oversees and comprehensively monitors all system services, including adding and managing admin accounts and audit trails. Additionally, all the admins can view the admin dashboard where detailed analytics about the transactions are shown in which they can generate reports. All these actors must be logged in to access their privilege in the application.

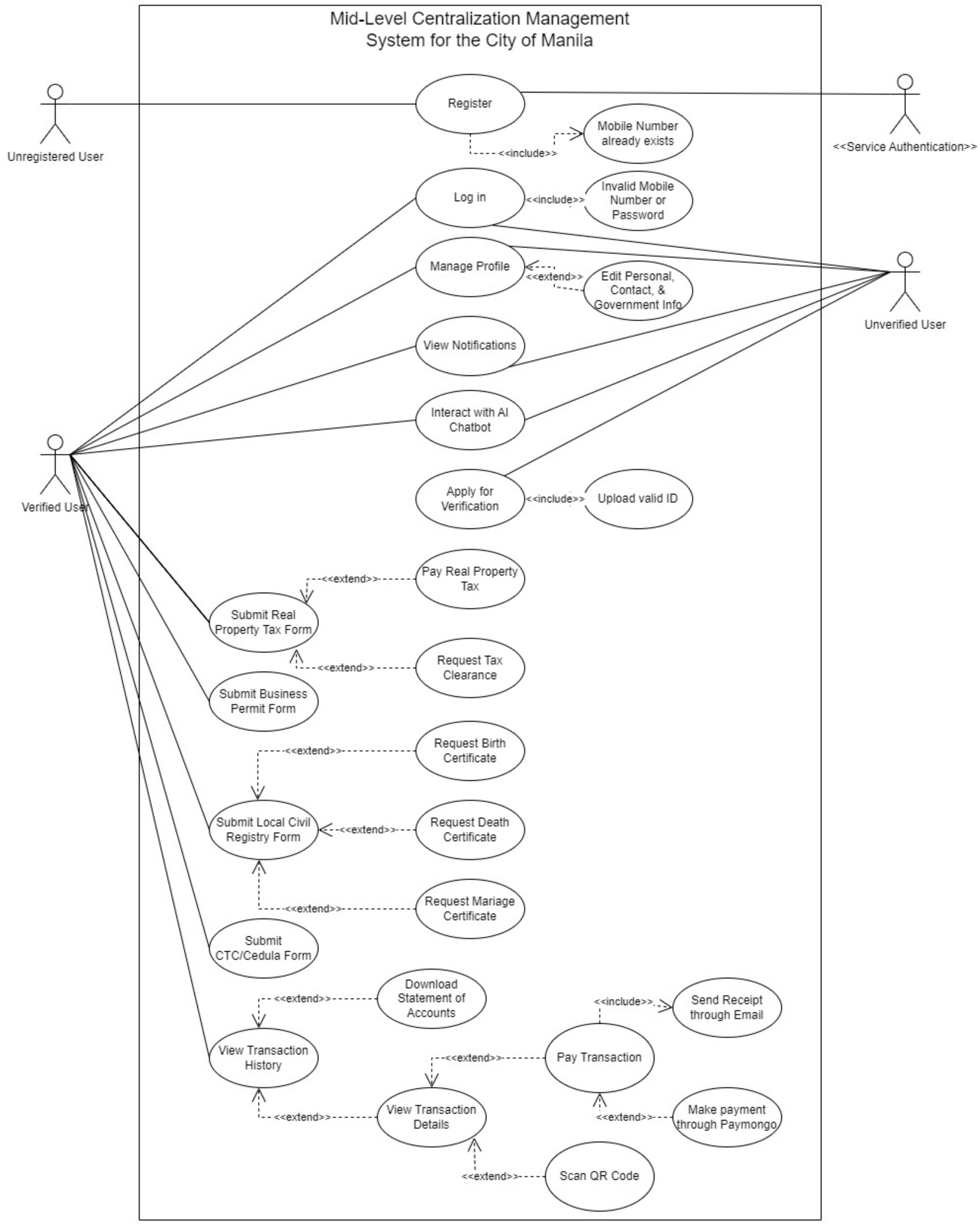

Figure 2. Client Use Case Diagram

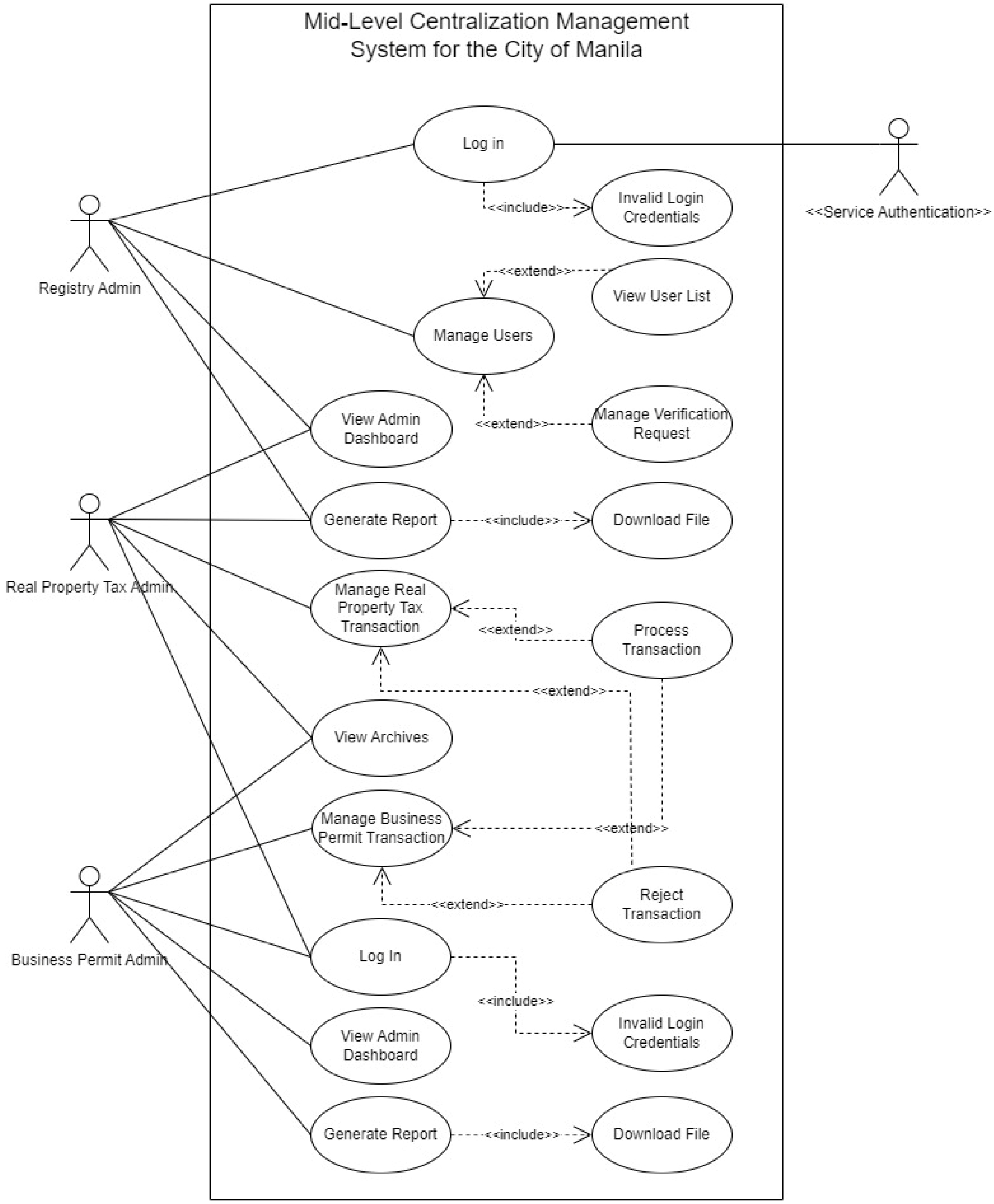

Figure 3. Admin Use Case Diagram I

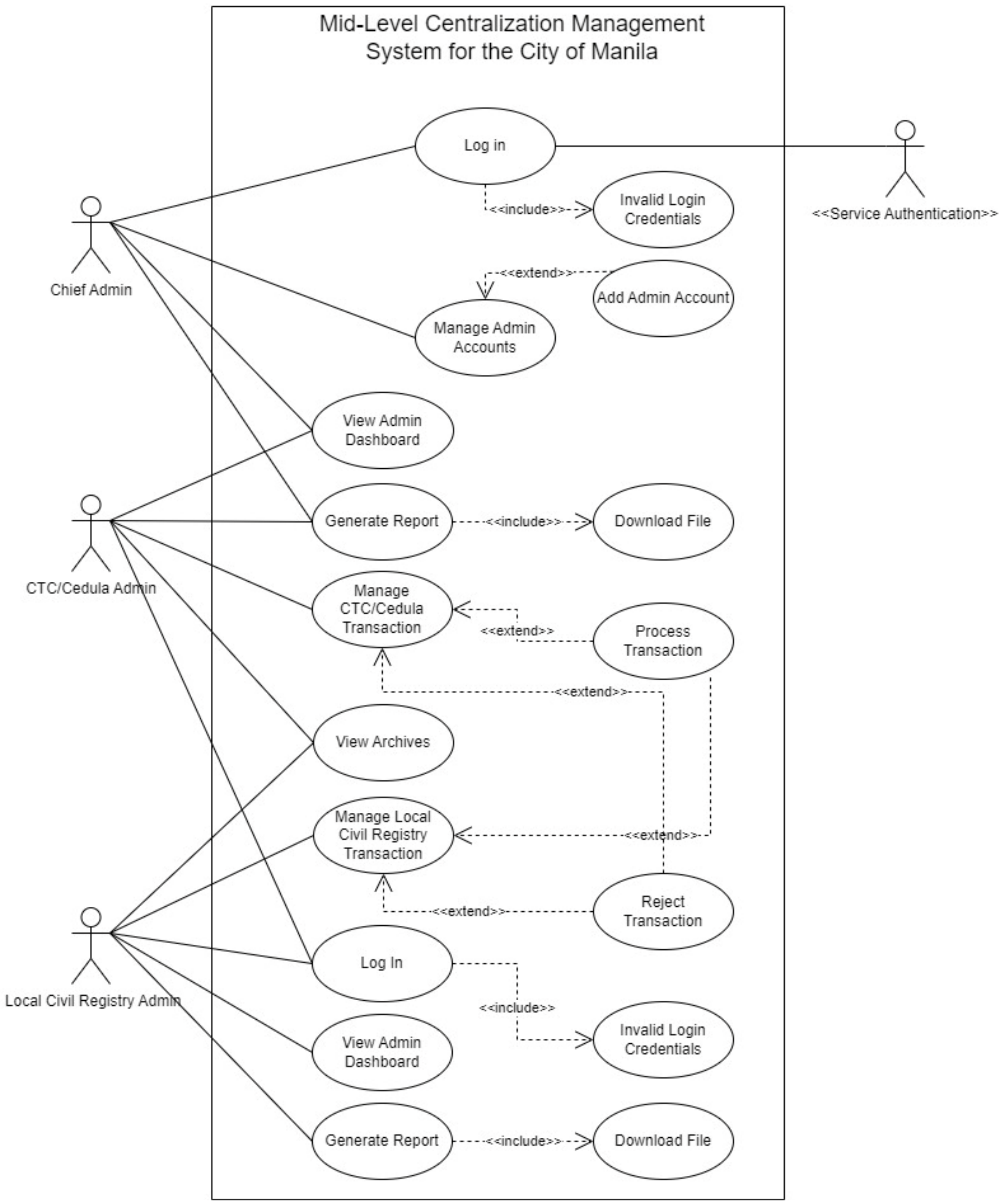

Figure 4. Admin Use Case Diagram II

Use Case Description

Tables 1-14 cover Client Use Case Descriptions, while Tables 15-24 present Admin Use Case Descriptions for the web application. It provides details such as module, pre-condition, post condition, and the actors. Each use case has a corresponding module name that describes the processes in the system. The precondition describes the required state of the user to execute a specific function in the system. On the other hand, the postcondition is the expected state of the user after the execution. Lastly, the actor column shows who are the participants in each use case.

Client Use Case Description

Table 1

Register Use Case Description

Module	**Register**
Precondition	None
Postcondition	User account is created
Actor	Unregistered User

Table 2

Log-in Use Case Description

Module	**Log-in**
Precondition	None
Postcondition	User account is redirected to the homepage
Actor	Unverified User, Verified User

Table 3

Manage Profile Use Case Description

Module	**Manage Profile**
Precondition	User is logged in
Postcondition	User updated his personal, contact, and government information
Actor	Unverified User, Verified User

Table 4

View Notifications Use Case Description

Module	**View Notifications**
Precondition	User is logged in
Postcondition	Unread notifications were displayed
Actor	Unverified User, Verified User

Table 5

AI Chatbot Use Case Description

Module	**Interact with AI Chatbot**
Precondition	User is logged in
Postcondition	AI Chatbot responded to users' inquiry
Actor	Unverified User, Verified User

Table 6

Apply for Verification Use Case Description

Module	**Apply for verification**
Precondition	User did not apply for verification before
Postcondition	User have attached a valid id and a message have appeared saying that request for verification is successful

Actor	Unverified User

Table 7

Submit RP Tax Use Case Description

Module	**Submit Real Property Tax Form**
Precondition	User is logged in; User is in Tax Payment or Tax Clearance section and the form is filled out
Postcondition	Real Property Tax Form is submitted
Actor	Verified User

Table 8

Submit Business Permit Use Case Description

Module	**Submit Business Permit Form**
Precondition	User is logged in; Business Permit Form is filled out
Postcondition	Business Permit Form is submitted
Actor	Verified User

Table 9

Submit CTC/Cedula Use Case Description

Module	**Submit CTC/Cedula Form**
Precondition	User is logged in; CTC/Cedula is filled out
Postcondition	CTC/Cedula Form is submitted
Actor	Verified User

Table 10

Submit Local Civil Registry Use Case Description

Module	**Submit Local Civil Registry Form**
Precondition	User is logged in; Local Civil Registry Form is filled out
Postcondition	Local Civil Registry Form is submitted
Actor	Verified User

Table 11

Transaction History Use Case Description

Module	**View Transaction History**
Precondition	User is logged in
Postcondition	Past transactions created by user is displayed
Actor	Unverified User, Verified User

Table 12

Download SOA Use Case Description

Module	**Download Statement of Accounts**
Precondition	User has transactions with statuses labeled as “pending”
Postcondition	PDF file is downloaded containing the SOA of the transaction
Actor	Verified User

Table 13

Pay Transaction Use Case Description

Module	**Pay transaction**
Precondition	Transaction is labeled as pending; User has enough funds
Postcondition	Transaction status is updated to paid and receipt is sent through users' email
Actor	Verified User

Table 14

Scan QR Code Use Case Description

Module	**Scan QR Code**
Precondition	User has viewed the transaction details
Postcondition	PDF file is downloaded containing the details of the transaction
Actor	Verified User

Admin Use Case Description

Table 15

Manage Users Use Case Description

Module	**Manage Users**
Precondition	Admin is logged in
Postcondition	User list and user verification requests is displayed
Actor	Registry Admin, Chief Admin

Table 16

Admin Dashboard Use Case Description

Module	**View Admin Dashboard**
Precondition	Admin is logged in
Postcondition	Dashboard containing statistics related to their respective module is displayed
Actor	Chief Admin, Registry Admin, Real Property Tax Admin, Business Permit Admin, CTC/Cedula Admin, Local Civil Registry Admin

Table 17

Manage RP Tax Use Case Description

Module	**Manage Real Property Tax Transaction**
Precondition	Client submitted a Real Property Tax transaction
Postcondition	Admin rejected or processed the transactions; Transaction status is updated
Actor	Real Property Tax Admin

Table 18

Manage Business Permit Use Case Description

Module	**Manage Business Permit Transaction**
Precondition	Client submitted a Business Permit transaction
Postcondition	Admin rejected or processed the transactions; Transaction status is updated
Actor	Business Permit Admin

Table 19

Manage CTC/Cedula Use Case Description

Module	**Manage CTC/Cedula Transaction**
Precondition	Client submitted a CTC/Cedula transaction
Postcondition	Admin rejected or processed the transactions; Transaction status is updated
Actor	CTC/Cedula Admin

Table 20

Manage Local Civil Registry Use Case Description

Module	**Manage Local Civil Registry Transaction**
Precondition	Client submitted a Local Civil Registry transaction
Postcondition	Admin rejected or processed the transactions; Transaction status is updated
Actor	Local Civil Registry Admin

Table 21

Generate Report Use Case Description

Module	**Generate Report**
Precondition	Admin is logged in and is in the admin dashboard
Postcondition	PDF file is downloading containing the report from the dashboard
Actor	Chief Admin, Registry Admin, Real Property Tax Admin, Business Permit Admin, CTC/Cedula Admin, Local Civil Registry Admin

Table 22

Manage Audit Trail Use Case Description

Module	**Manage Audit Trail**
Precondition	Chief Admin is logged in
Postcondition	Details of Admin and their activities within the system are displayed
Actor	Chief Admin

Table 23

Add Admin Use Case Description

Module	**Add Admin**
Precondition	Chief Admin is logged in
Postcondition	New admin is added in the system with strong password
Actor	Chief Admin

Table 24

Manage Admin Accounts Use Case Description

Module	**Manage Admin Accounts**
Precondition	Chief Admin is logged in
Postcondition	All current admins are displayed along with their account credentials
Actor	Chief Admin

System Flowchart

Figure 5 presents the complete process of how the application flows. When the user is on the login page, he can either login as an admin or a regular user. Upon choosing the admin, he is then required to enter his login credentials such as Admin ID and password.

Each admin has a specific Admin ID to log in on the website. Having different admins ensures that each department can manage their tasks efficiently and provide confidentiality to user data. The web application is composed of six admins namely: Chief Admin, Registry Admin, Real Property (RP) Tax Admin, Community Tax Certificate (CTC) or Cedula Admin, and Business Permit Admin. The Chief Admin has the capability to add an administrator, manage admin accounts and manage audit trails which track the changes made by the other admins in the system. If the admin is a Registry admin, he can view the user list and manage the application for user verification. Meanwhile, admins like the Real Property Tax Admin can manage the RP tax transactions. while the Local Civil Registry admin manages all the local civil registry transactions which includes request for birth certificate, death certificate, and marriage certificate. Concurrently, the CTC/Cedula Admin manages the transaction that involves applying for CTC or Cedula and the Business Permit Admin manages the business permit transactions that the citizens make. If the transaction is Tax Payment and Business Permit, the admin is tasked to input charges that the user must pay. When an admin rejects a transaction, it is required to put a remark to notify the user why it is rejected. Additionally, admins can view archived transactions, including those that are complete, rejected, or expired. All admins have the capability to configure their account settings based on their preferences and generate reports in each respective admin dashboard.

Figures 6, 7, and 8 show the Client Use Case Diagrams. If a user logs in as a regular user, the system checks if the user is registered. If the user wishes to register, he can only register a new mobile number, otherwise, an error message is displayed. If the user is already registered, he can then proceed to the login page. If the user is first time logging in after being registered, an OTP is sent to the user to authenticate the login. After this, the user is redirected to the homepage containing brief information about the services offered by the system. Also, the user can interact with the AI chatbot to answer inquiries within the scope of the system. An unverified user has limited access to the system which is to edit profile like personal information, contact information, and government information. However, he can also change his password, profile picture, and apply for verification in the account settings. Applying for verification requires attaching a valid ID. Once a user has verified status and agreed to terms and conditions, he is granted more privilege like process RP tax, process business permit, process CTC/Cedula, and apply for local civil registry documents such as birth certificates, death certificates, and marriage certificates. After submitting a form, the user is redirected to the transaction history. A user can only download Statement of Accounts if the transaction status is pending. By viewing the transaction details, it displays the information the user provided when filling out the form. Also, a QR code can be scanned to download the details of the transaction. Additionally, a user can make payment to an unpaid transaction through PayMongo. After paying, the user must wait for the admin to process the transaction, marking the transaction status as completed or rejected. Once it became completed, the user can now claim the documents by following the instructions in the email. Once the user or admin has decided not to do anything with the web application anymore, he/she may end the session and choose to log out.

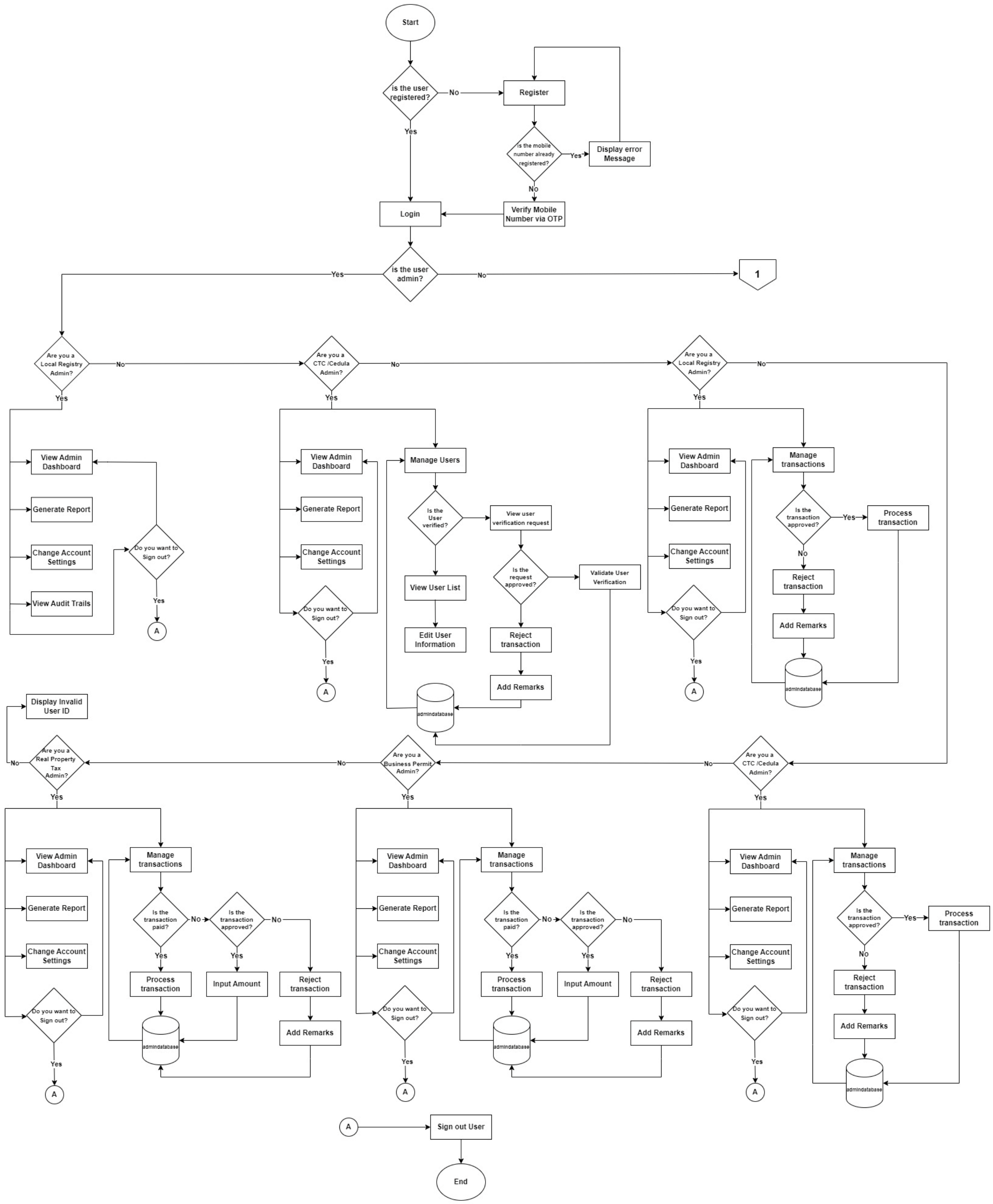

Figure 5. Admin System Flowchart

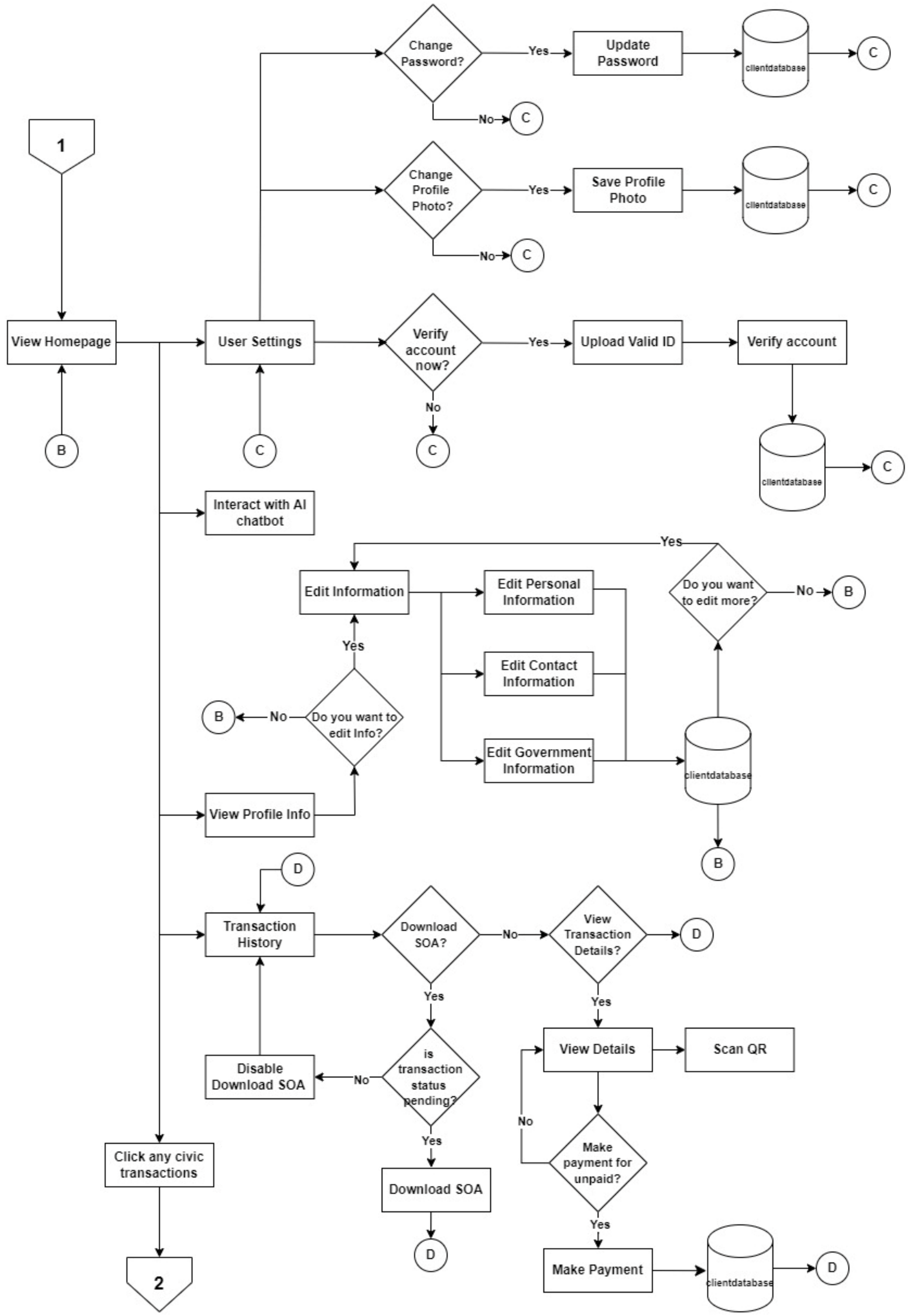

Figure 6. Client System Flowchart I

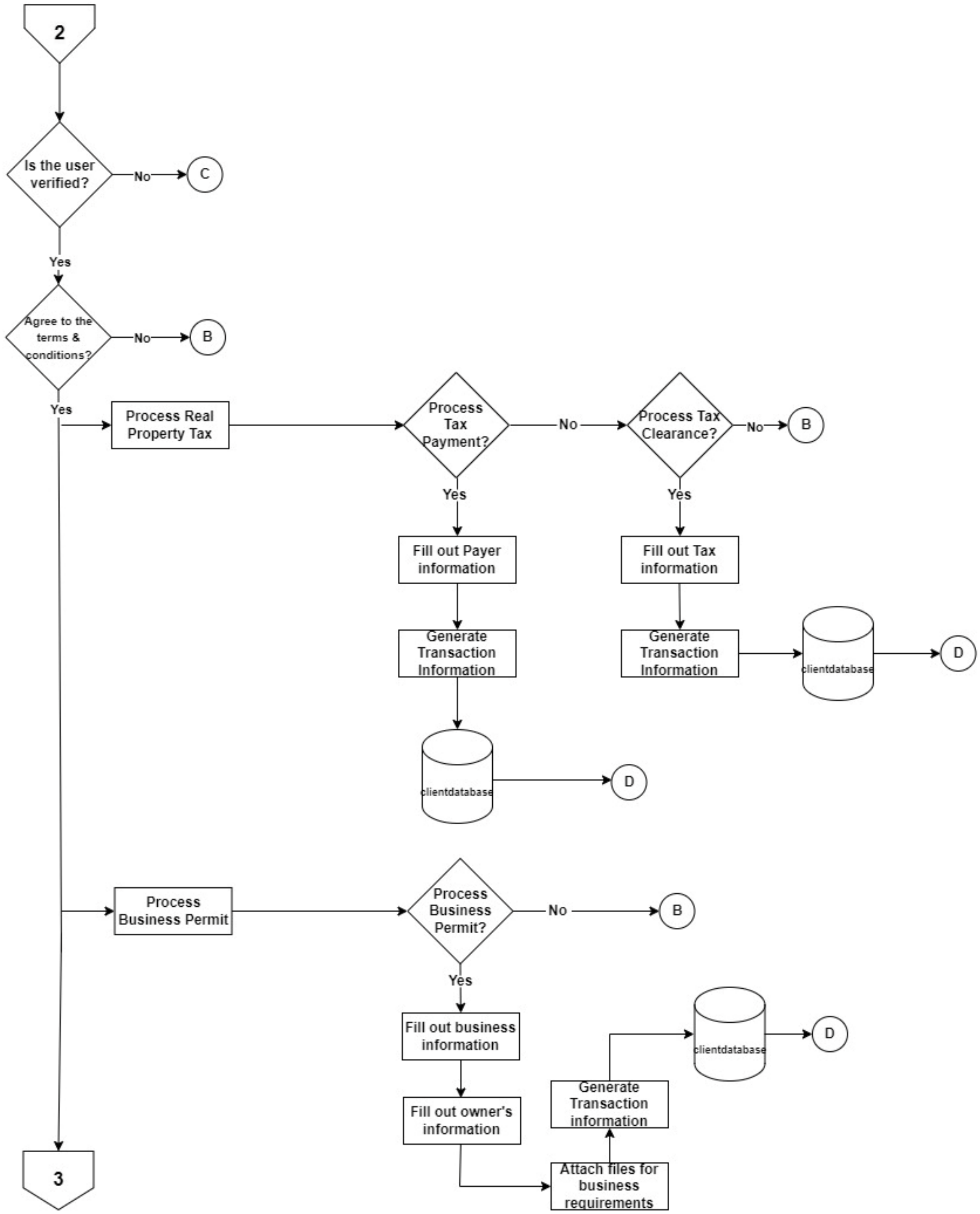

Figure 7. Client System Flowchart II

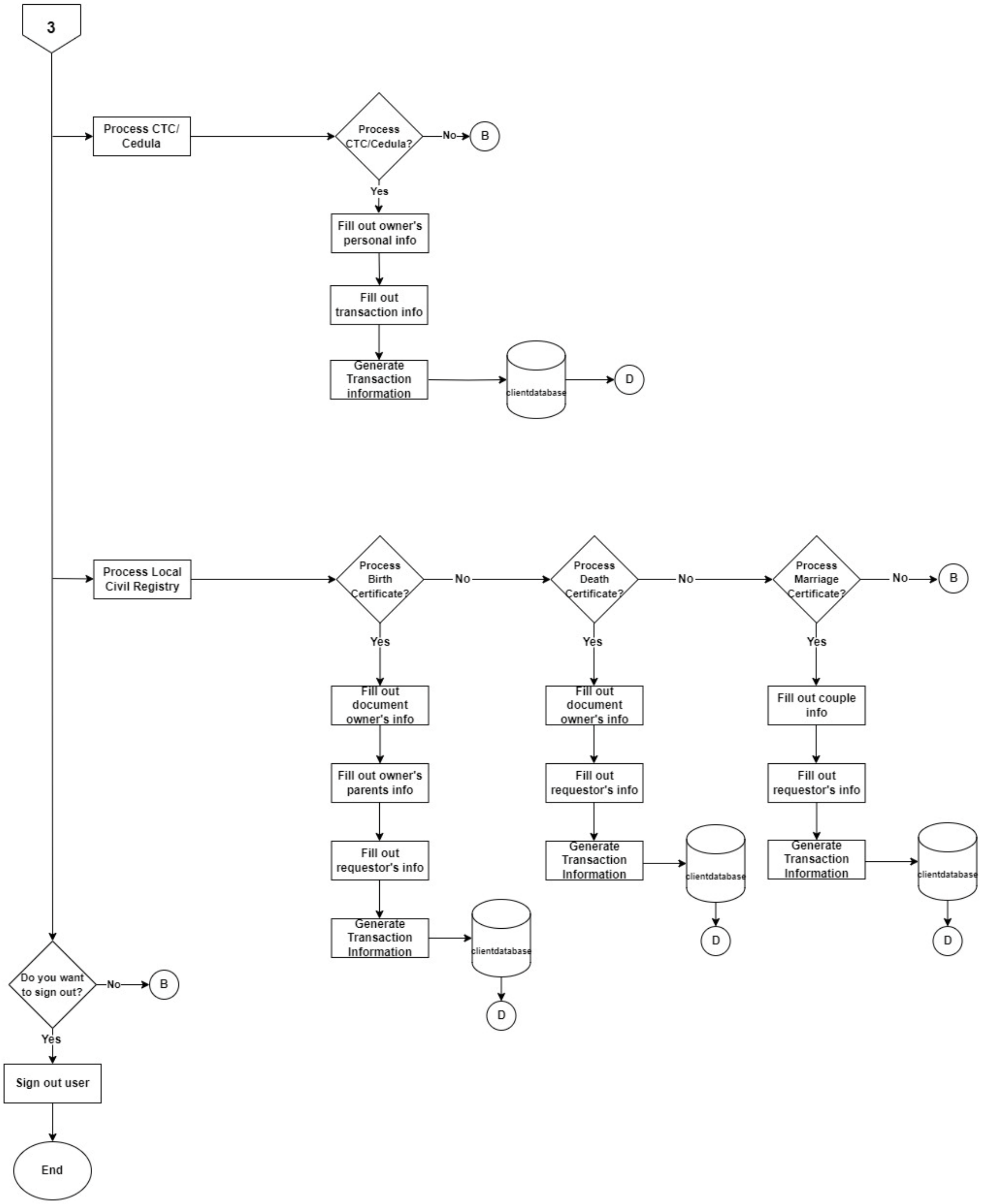

Figure 8. Client System Flowchart III

System Architectural Design

Figure 9 illustrates the flow of operations in the admin centralization management system. The administration component is responsible for handling information, transactions, and connection to the client database. The client database, in turn, forwards user requests to the web host. Subsequently, the client database communicates with the admin centralization management system once again. The admin centralization management system further interacts with the admin database. The Mid-level Centralization Management component checks and retrieves information from both the admin and client databases, ultimately generating statements of accounts. Additionally, the statement of accounts component is linked to user-provided data, which includes information about how the software is utilized by end-users and any issues encountered. Lastly, the web host is integrated into the Mid-Level Centralization process.

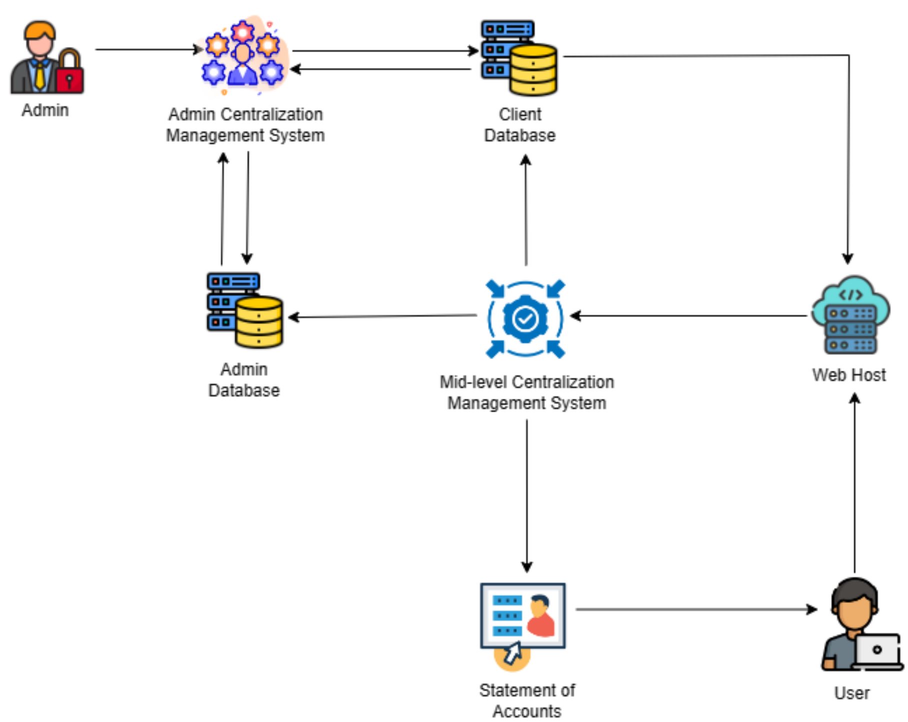

Figure 9. System Architectural Design

Project Development

This part of the study highlights the comprehensive development of the project. The first part of the research is data gathering wherein the researchers collect and analyzes the data to understand the manual processes that need to be automated and centralized at the Manila City Hall. Additionally, various tools and technology are studied by the researchers so that appropriate solutions are applied to streamline the operations of the said city hall.

The tools and resources are scrutinized after the data gathering and advances in designing the application. Consequently, the features and components are continuously tested as the development of the application takes place. The purpose of this is to check for bugs in the said feature and ensure that the application is running and functioning well. The researchers must verify and correct if there are any bugs identified.

Developing the system is a series of procedures such as coding and testing until the system is fully functional. It is then evaluated with ISO/IEC 25010 as the standard.

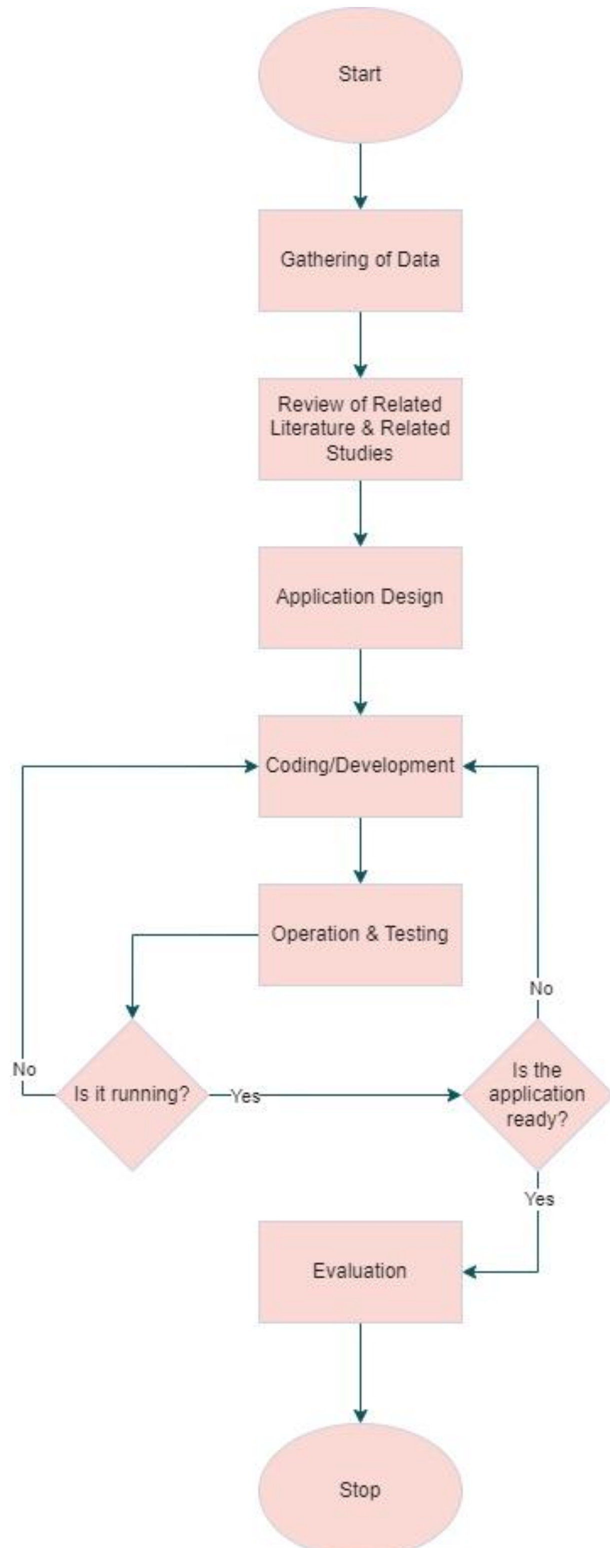

Figure 10. Project Development Flow

Entity Relationship Diagram

This entity relationship diagram illustrates the connections between entities and displays the attributes of each entity. Within the diagram, a one-to-one relationship signifies that each transaction in one entity is linked to a single transaction in another entity. Conversely, a one-to-many relationship indicates that a transaction in one entity can be associated with multiple transactions in another entity, while the latter is linked to only one transaction in the former. Lastly, a many-to-many relationship signifies that numerous records in one entity are connected to multiple records in another entity.

Figure 11 displays the entity relationship diagram of the system. The developed web application has thirteen entities namely: user, admin, personal information, contact information, government information, verification, RP tax, business permit, CTC or cedula, birth certificate, death certificate, marriage certificate, and transaction,

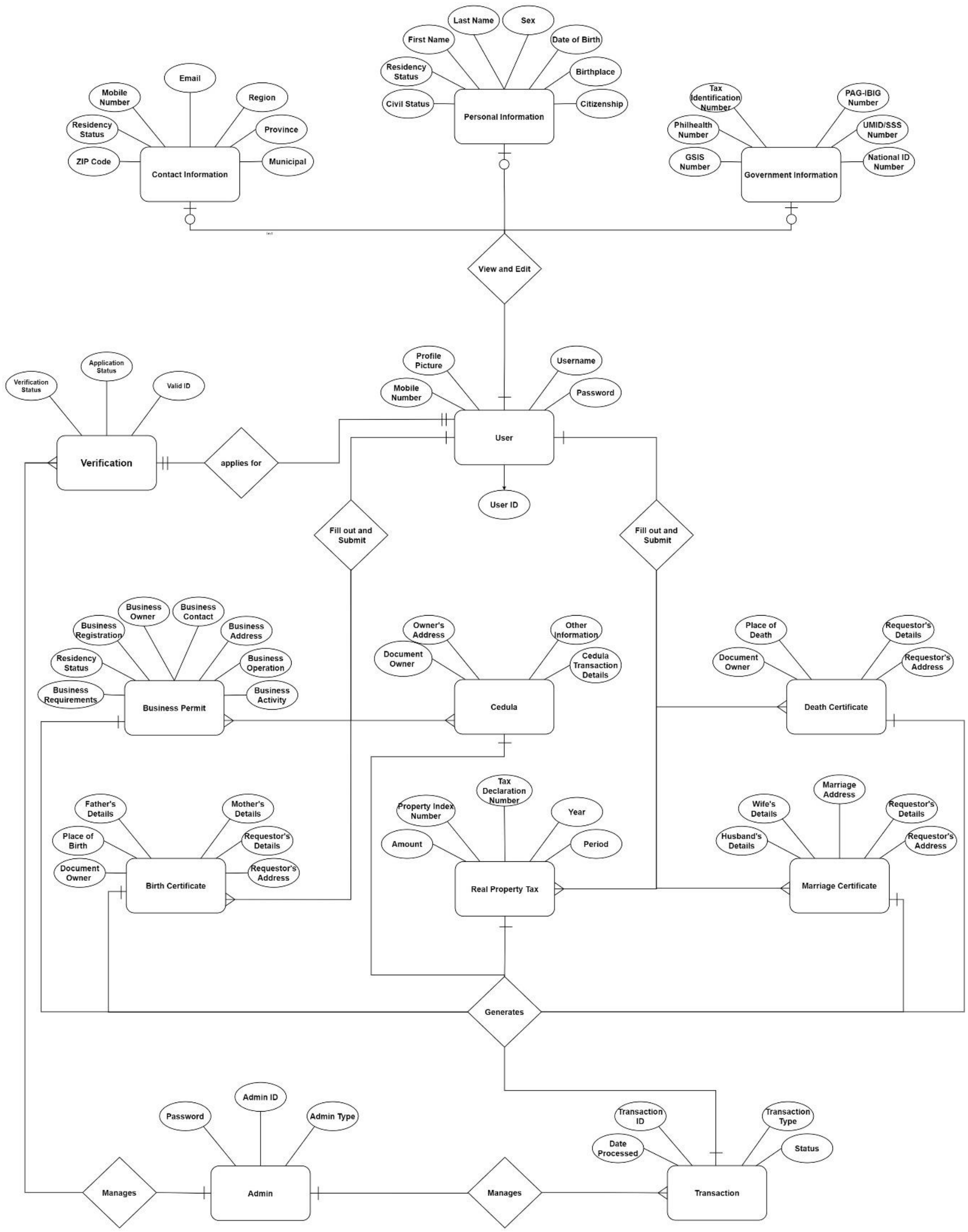

Figure 11. Entity Relationship Diagram

Program Coding

(Workbench MYSQL, REACT, NODE, EXPRESS, GITHUB)

1. Created a folder and opened the command prompt which directs to PowerShell.
2. Created a Vite using Windows PowerShell by running the command "npm create vite." Selected the React framework and chose the Variant as JavaScript.
3. Installed the "j.son" package and Node modules using "npm install" for their external libraries, modules, and packages.
4. Installed Express on Windows using "npm install express." Express was used to establish connections with databases and interact with the database.
5. Installed react-router-dom with the command "npm install react-router-dom." Utilized react-router-dom to set up routing for components.
6. Installed Axios with "npm install axios." Axios simplifies sending requests to the web application, including GET, POST, and Delete.
7. Installed TailwindCSS. This framework was utilized for frontend styling to avoid creating custom CSS styles.
8. Created a database using MySQL Workbench with the guidance of the database design.

Backend Coding Function

1. Created a "Connection.js" file using "mysql.createConnection" to establish a connection between the MySQL database and the program.

2. Developed a "register.js" file that included the "queryDatabase" function for storing data from the database. This file also had a function for handling "app.get()" requests to retrieve the user's First Name, Last Name, and mobile number. It generated a user_id by combining the first letters of the First Name and Last Name with the last four digits of the mobile number, resulting in an account register like "Exp RL1485."

3. Created "App.jsx," where to set up routes for each page. This file defines a collection of routes that can be accessed with `<Route>` elements. For example: `<Route exact path="/"></Route>`.

4. Imported routers using Express by including "import { Router } from 'express';" in every JavaScript file that utilized the router as middleware to facilitate communication between the frontend and backend.

5. Imported "Connection.js" in every JavaScript file to read the database, preventing the need for repetitive database connections in each JavaScript file.

6. Developed a "login.js" file where users were required to enter a username and password to access the system. Upon a successful login, the user_id was stored in the session.

7. Created a "profileHandler.js" file to manage various functions, including router.get, router.put. router.get was used to retrieve data from the database and display it on the designated pages, while router.put was used to update data received from the frontend and send it back to the backend database. It then returned the result to router.get for displaying the latest updates. Additionally, the router was utilized to encapsulate code into components, which could be called through routing.

8. Created index.js, here at index.js, where you can set up the CORS along with the API. For the API, this was set up with the default calling api.use('/api/name, filename);. /api/ use for prefix so the backend could easily call all the APIs with a same prefix, and name was the name of the API, while filename was the name of the file stored in the routes.

9. Inside the index.js, CORS was also present. It was a security feature implemented by web browsers to allow or restrict resources (such as fonts, JavaScript, etc.) on a web page to be requested from another domain outside the domain from which the first resource was served. Web security allowed servers to specify who could access their resources and it could be accessed.

10. Create paymentMethod.js. Inside this file, it included the function and API calling of the payment method. For the payment method, Paymongo was utilized as payment provider. Paymongo had its own dashboard on its website. The API that was utilized included POST Checkout, Get CheckoutRetrieve, POST RefundCheckout.

11. Created a firebase.config.js file to initialize and configure Firebase in the application. This configuration was used to set up Firebase services, such as Google Authentication, Facebook Authentication, and OTP (One-Time Password) Authentication, which allowed users to sign in using various providers. The lines "import{ initializeApp } from 'firebase/app'; import { getAuth } from 'firebase/auth';" imported the necessary functions from the Firebase SDK to initialize the app and access Firebase Authentication services. It included the API key, authentication domain, project ID, storage bucket, messaging sender ID, app ID, and optionally the measurement ID.

These details were unique to your Firebase project and were required to connect your application to Firebase services.

12. Installed Dotenv, Environment variables were used to store sensitive information such as API keys, database URLs, and other configuration settings that were not hardcoded into the source code. By loading these variables from an .env file into process.env, dotenv it helped keep the application configuration organized and secure across different environments.

13. Implemented ".gitignore" file that told Git which files and directories to ignore in a project. In this file, node_modules, .DS_Store, dist, dist-ssr, /uploads, and .env were specified to be ignored because it contained dependencies, system-specific files, build outputs, user uploads, and sensitive environment variables, respectively. This helped keep the repository clean and manageable.

14. Implemented SMTP with the Google API by enabling the Gmail API in Google Cloud project and download the OAuth 2.0 credentials. Then, installed the required libraries and used the credentials to authenticate and send emails through the Gmail API.

15. Implemented JWT token generation and verification. The /generate-token endpoint created a JWT containing a user ID and sends it back to the client. The verifyToken middleware ensured that incoming requests contained a valid JWT in their headers. If the token was missing or invalid, it returns an error response. Protected routes, like /protect-token/:user_id and /protected-route, used this middleware to authenticate and authorize access based on the token's contents. If the token is valid, these routes provide access to specific resources or functionalities.

16. Implemented QR code generation for selected transactions. Upon scanning, users were directed to the backend for download. Additionally, jsPDF-AutoTable was utilized which ensures a pleasant viewing of Statement of Account (SOA). Furthermore, for admin reports and filters, it enabled users and admins to easily filter records and leverage its functions.

Frontend Coding Function

1. Developed "Landingpage.jsx," which served as the frontend for the landing page. It also included the login page and a registration button that directs user to the registration page if needed.

2. Created "Loginadmin.jsx," which provided the login page and redirected to the admin side when specific conditions were met.

3. Created a "userLocation()" function along with "pathname.split("/"[2])" to extract the user_id from the second "/" segment in the URL.

4. Utilized the "useEffect()" async hook to allow time for execution and optimize data fetching from AXIOS, which also improved the user experience.

5. Created "RPTaxPayment.jsx," "RPTaxClearance.jsx," and "PersonalInfo.jsx" with sub-content sections for Personal Info, Contact Info, and Government Info.

6. Created a "fetchUserPersonal()" function using axios.get to retrieve data from the database to the frontend based on the user_id.

7. Implemented a "handleInputChange()" function and "setUserPersonal((prevData))" function in order to make changes to the data within the pages.

8. Created the "handleSubmit()" function which acts as the submission of changes to the database when all the necessary text modifications are completed.

9. Developed "isModalOpen()" and "handleCloseModal()" functions to prompt the users for confirmation when users wanted to make changes or request modifications to the text.

10. Implemented “const token = localStorage.getItem('token');” in the frontend to check the token inside the localStorage. If there is no token inside the localStorage, it generated and called API from the backend.

11. Implemented Password Rule, const passwordRule along with the setPasswordCriteria ensuring the user met the requirements to input the password into the database.

12. Implemented preventDefault() which was used to stop the default behavior associated with an event. It was often employed within event handlers to prevent actions like form submissions or link clicks from triggering their default behaviors, allowing developers to implement custom logic instead. This method was particularly useful for handling user interactions in a controlled manner within React components.

13. Implemented CAPTCHA by “onCaptchaVerify”. It was a custom event handler function name used to handle verification events triggered by a CAPTCHA (Completely Automated Public Turing test to tell Computers and Humans Apart) component or service. When a user interacted with a CAPTCHA challenge, such as by completing a task or checking a checkbox, the onCaptchaVerify function was typically called to process the verification result.

14. Created a “handleClearFilter” for clearing users or admins from using the filter button (searchInput, selectedType, selectedStatus, selectedDate).

Operation and Testing Procedure

The researchers conducted operation and testing procedures to be able to guarantee the correct and accurate functionality, features, and capabilities of the system. The testing procedure verifies every module of the system to work what it is supposed to work for. Moreover, executing a test case guided the researchers to identify and prevent possible errors and bugs of the system. Presented in Table 25 is a sample test case to showcase the sample testing procedure.

Table 25

Test Case Sample

Test Case ID		F-031		UC Reference	Verified User
Objective		Be able to upload documents in business requirements.			
Assumptions/Preconditions		User is on the business permit page and agreed to the terms and conditions.			
Actions		Expected Result		Actual Result	
1. Find the business requirements section then click any upload button. 2. Upload a document by dragging and dropping a file or click the box to upload. Then, click upload.		1. File window should be displayed and must let the user attach a file and upload it.		1. File window was displayed and allowed the user to attach a file and upload it.	
Status	PASSED	Severity		Priority	

All testing procedures were audited in accordance with the use case associated with the test case. The case testing was then rated as either “passed” or “failed”. The rating is labeled “passed” when the testing illustrated the actual result of what is expected. On the other hand, the rating is labeled as “failed” when a different actual result was illustrated to what is expected. Moreover, the severity of the error is identified, which indicates the degree of the error as to how it will affect the development process of the system. The priority levels were also shown to indicate the significance of what problem must be addressed first. The severity and priority are illustrated in Tables 26 and 27 respectively.

Table 26

Degree of Severity Classification

Severity	**Description**
Critical	The issue or problem indicates that the process has been entirely interrupted and cannot proceed until it is resolved.
Major	The issue or problem causes the system to crash.However, some modules remain operational.
Minor	The issue or problem does not cause any significant inconvenience or system failure.

Table 27

Priority Classification

Severity	**Description**
High	The issue or problem significantly affects the application; thus, it must be resolved as soon as possible.

Moderate	The issue or problem should be fixed to ensure the proper flow of the system development and prevent larger errors.
Low	The issue or problem should be resolved only when all necessary errors are addressed, as it does not cause any critical errors.

Furthermore, Tables 28 and 29 shown below illustrate the overall summary of the test cases, indicating the functional suitability test cases and the security test cases respectively.

Table 28

Summary on Functional Suitability Test Cases

Use Case	Number of Test Cases
Unregistered User	
Unverified User	
Verified User	
Registry Admin	
Real Property Tax Admin	
Business Permit Admin	
CTC/Cedula Admin	
Local Civil Registry Admin	
Chief Admin	

Total

Table 29

Summary on Security Test Cases

Test Case ID	**Objectives**

In Table 30 and 31, it shows the steps needed to be properly executed and expected output for each module to test for functional suitability and security.

Table 30

Testing Procedure for Functional Suitability

Module	Steps Undertaken	Expected Output
Register (Functional Correctness)	1. In the landing page, click register here button. 2. Fill out the necessary information including an email account and mobile number.	• The user should be redirected to the homepage. • Information provided by the user is correctly captured and stored.
Login (Functional Correctness)	1. In the landing page, provide login credentials via mobile number and password, Google account, or Facebook account.	• The user will successfully be redirected to the homepage.

Payment (Functional Completeness)	1. Go to transaction history. 2. View transaction details. 3. Click pay button.	• The user should be redirected to PayMongo. • The user should be provided with different payment options like Gcash, Grabpay, Maya, and BillEase. • The status of the transaction should be updated to paid.
Download Statement of Accounts (Functional Appropriateness)	1. Go to transaction history. 2. Click the Download SOA button.	• A PDF file containing the SOA of the transaction should be downloaded by the user.
Create Transaction for Real Property Tax Payment and Tax Clearance (Functional Completeness)	1. In the sidebar, click Real Property Tax page. Choose either make a tax payment or tax clearance. 2. Fill out the necessary information, then click proceed. 3. Review the details and click submit.	• The user should be redirected to transaction history where the newly created transaction is displayed.
Create Transaction for Business Permit (Functional Completeness)	1. In the sidebar, click Business Permit page. 2. Fill out the necessary information, then click proceed. 3. Review the details and click submit.	• The user should be redirected to transaction history where the newly created transaction is displayed.
Create Transaction for CTC/Cedula (Functional Completeness)	1. In the sidebar, click CTC/Cedula page. 2. Fill out the necessary information, then click proceed. 3. Review the details and click submit.	• The user should be redirected to transaction history where the newly created transaction is displayed.
Create Transaction for Local Civil Registry including Birth, Death, and Marriage Certificate (Functional Completeness)	1. In the sidebar, click Local Civil Registry page. Choose either birth certificate, marriage certificate, or death certificate. 2. Fill out the necessary information, then click	• The user should be redirected to transaction history where the newly created transaction is displayed.

	proceed. 3. Review the details and click submit.	
View Notifications (Functional Appropriateness)	1. Click the notification button.	• Relevant updates should be displayed to the user.
Interact with AI Chatbot (Functional Appropriateness)	1. In the homepage, click the AI chatbot. 2. Input any inquiries within the scope of the system.	• The user should receive a response from the AI chatbot.
Manage Transaction History (Functional Appropriateness)	1. In the sidebar, click transaction history.	• A PDF file containing the transaction details should be downloaded.
Scan QR Code (Functional Correctness)	1. View transaction details. 2. Scan the QR code using a camera.	• The user should be able to see features like update profile picture, change password, and delete account.
Manage Settings (Functional Appropriateness)	1. Click the profile picture of the user. 2. Click settings.	The user should be able to send account verification request.
Account Verification (Functional Completeness)	1. Go to settings. 2. Click apply for account verification. 3. Attach a valid ID. 4. Click submit	• The user should be able to send account verification request.
Sign out user (Functional Correctness)	1. Click profile picture. 2. Click logout.	• The user should be successfully logged out from account. • The user should be redirected to the landing page.

View Admin Dashboard (Functional Appropriateness)	1. In the sidebar, click dashboard page.	• Relevant metrics should be displayed to the admin.
Generate Report (Functional Completeness)	1. Click Generate Report button.	• A PDF file should be downloaded containing the report displayed in the admin's dashboard.
Manage Real Property Tax Transactions (Functional Completeness)	1. In the sidebar, click Real Property Tax. 2. Click Tax Charges page. Click check symbol to process transaction. Then, input amount user must pay. Click confirm. 3. Click Awaiting Payment Page. 4. Click Processing Section Page. Then, click check symbol.	• Admin should be able to charge the user after entering the amount. • Transaction with pending status should be displayed in the awaiting payment page. • Admin should be able to update transaction to completed status after processing.
Manage Business Permit Transactions (Functional Completeness)	1. In the sidebar, click Business Permit. 2. Click Permit Charges page. Click check symbol to process transaction. Then, input amount to fields user must pay. Click confirm. 3. Click Awaiting Payment Page. 4. Click Processing Section Page. Then, click check symbol.	• Admin should be able to charge the user after entering the amount. • Transaction with pending status should be displayed in the awaiting payment page. • Admin should be able to update transaction to completed status after processing.
Manage CTC/Cedula Transactions (Functional Completeness)	1. In the sidebar, click CTC/Cedula. 2. Click Awaiting Payment Page. 3. Click Processing Section Page. Then, click check symbol.	• Transaction with pending status should be displayed in the awaiting payment page. • Admin should be able to update transaction to completed status after processing.

Manage Local Civil Registry Transactions (Functional Completeness)	1. In the sidebar, click Local Civil Registry. 2. Click Awaiting Payment Page. 3. Click Processing Section Page. Then, click check symbol.	• Transaction with pending status should be displayed in the awaiting payment page. • Admin should be able to update transaction to completed status after processing.
Manage Registry (Functional Appropriateness)	1. In the sidebar, click Registry. 2. Click User List page. 3. Click a user from the list. 4. Click the User Verification page. 5. Click the Approve button.	• Admin should be able to details of the user after clicking a user. Also, edit button should appear. • User should have a verified status. • Admin should be able to update transaction to completed status after processing.
Manage Audit Trail (Functional Completeness)	1. In the sidebar, click Audit Trail.	• Details of activities of administrators within the system should be displayed.
Manage Admin	1. Click the “Manage Accounts” button at the sidebar	• Must view the admin list page

Table 31

Testing Procedure for Security

Module	Steps Undertaken	Expected Output
Login Authentication (Authenticity)	1. Login with invalid user credentials 2. Login with valid user credentials	• Signing in with invalid user credentials should display an error message saying “Authentication failed. Please check your credentials” • Signing in with valid user credentials should redirect the user to the homepage.
Password Requirements (Confidentiality)	1. Attempt to create password that doesn’t meet the password requirements. 2. Attempt to create password that meets the password requirements.	• Creating password that doesn’t meet requirements should display an error message saying, “Password must be at least 8 characters long and include at least one uppercase letter, one lowercase letter, one symbol, and one number.” • Creating a password that meets the requirement will let the user use that password when logging in.
Multi-factor Authentication (Authenticity)	1. Attempt to use mobile number and type invalid OTP. 2. Attempt to use mobile number and type valid OTP sent via SMS.	• Typing the wrong OTP should display an error message saying “Wrong OTP. Please provide a valid OTP”. • Typing the correct OTP should redirect the user to the homepage.
Audit Trails (Accountability)	1. Click Audit Trails in the sidebar.	• Details of activities of administrators within the system should be displayed.
Cancel Transaction	1. Go to transaction history. 2. View details of transaction which	• Transaction status should be updated to

(Non-repudiation)	has pending status. 3. Click the Cancel Transaction button.	canceled. • Transaction could no longer be processed by the admin.

As shown in Table 32 below, the test data were collected and reported at the end of each test cycle. The system would be deemed acceptable if all the tests' expected results were met and all the specified test cases were completed.

Table 32

Test Execution Summary

Executions	**Result Expectation**
Total Number of Test Cases Executed	100%
Test Case Result	
Passed	100%
Failed	0%
Total Number of Test Cases Unexecuted	0%

Evaluation Procedure

The researchers regulated the overall quality of the system using the standards of ISO/IEC 25010 as an instrument. The researchers assessed the functional suitability and security of the system as criteria in the rating system's 4-point Likert scale shown in Table 33. There were 30 people gathered by the researchers, which consisted of 20 IT Professionals, 5

Municipal Staffs, and 5 Ordinary Users. In addition to achieving the objective of the research, a demonstration on how to properly use the system was executed. The participants reviewed and assessed the relevance and value of the project with the help of the criteria that had been set as benchmarks. Accordingly, with the results of the evaluation, the overall weighted mean ratings for each criterion were calculated and converted into a qualitative interpretation with the use of the range of mean ratings shown in Table 34.

Table 33

Four-Point Likert Scale

Scale	Descriptive Rating
4	Outstanding
3	Acceptable
2	Fair
1	Not Acceptable

Table 34

Range of Mean Ratings and the Equivalent Descriptive Rating

Scale	Descriptive Rating
3.26 – 4.0	Very Acceptable
2.51 – 3.25	Acceptable
1.76 – 2.50	Fair

1.00 – 1.75	Not Acceptable

Chapter 4

RESULTS AND DISCUSSION

This chapter presents the results of the system evaluation. It discusses the project description, project structure, project capabilities and limitations, and project evaluation.

Project Description

The Mid-Level Centralization Management System is developed to digitalize and centralize the transactions in the City of Manila which provides convenience to its users. In addition, it safeguards sensitive data which makes it an efficient solution to manage cross-departmental operations. This project is developed using Visual Studio Code (VS Code) utilizing React.js, a full stack framework that builds upon Node.js and Express.js. Tailwind CSS is used for the front-end development and MySQL Workbench is used to store the data provided by the users. APIs and other services are also utilized such as Firebase, PayMongo, IBM Watson Assistant, and Google SMTP to create the system.

An internet connection and a web browser that supports JavaScript is required to access the web application. If a user is unverified, he/she has limited access to the system such as managing their profile including personal information, contact information, and government information, and interacting with the AI Chatbot. The user must apply for verification in the account settings by uploading their Valid ID. Once the user is verified, he/she can now fill out and submit forms in several transactions like RP Tax, CTC/Cedula, Business Permit, and Local Civil Registry documents. The system also implemented a payment method so that the user's request can be paid. Additionally, a centralized admin platform is developed where admins can handle user transactions and generate reports based on their assigned module within the system.

Project Structure

This section displays the structure of the web application through screenshots. It is divided into two parts: for citizens and for admins.

For admins:

Figure 12 shows the login page for the admin. It features the system's logo along with the title "Admin", so the user is guided that the login is for administrators. The admin must provide his/her Admin ID and password. The system detects the role of an admin based on the login credentials provided.

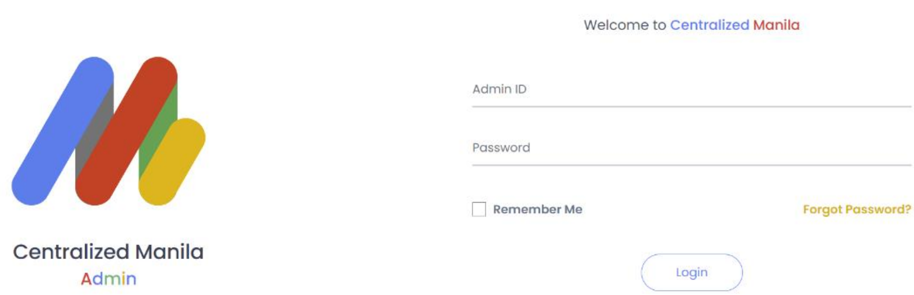

Figure 12. Admin Login Page

Figure 13 shows the account settings page for the admin. Once the admin clicks the "settings", it redirects to a page where he/she can change his avatar, as well as his/her password. The avatar section allows the admin to upload a new image to change the avatar. Meanwhile, the password section contains input fields labeled with current password, new password, and confirmation of the new password. A password guideline is also provided to guide the user in changing the password for added security.

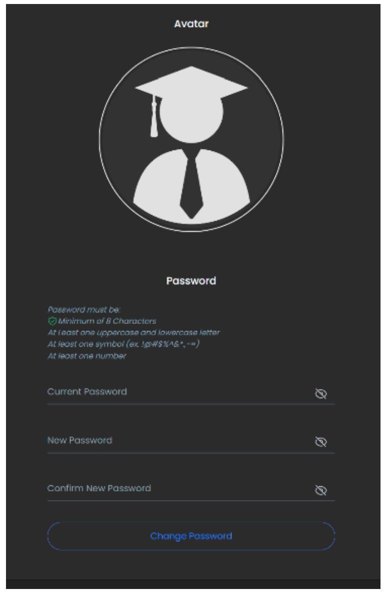

Figure 13. Admin Account Settings Page

Figure 14 shows the dashboard page for the Chief Admin. The dashboard displays service statistics (total transactions), total gross revenue, user registry (total number of users), total transactions for RP Tax Payments, Tax Clearances, Business Permits, CTC/Cedula, Birth Certificates, Marriage Certificates, Death Certificates, and Top locations of users which includes regions, provinces, and cities. The dashboard provides an overview of the said metrics as graphs equipped with title and color-coded lines and arrows according to categories. This enabled users to easily identify and understand what the graph displays. Also, the admin can toggle the color theme to dark or light using the switch. Moreover, by clicking "generate reports", it downloads the data from the dashboard to a pdf format.

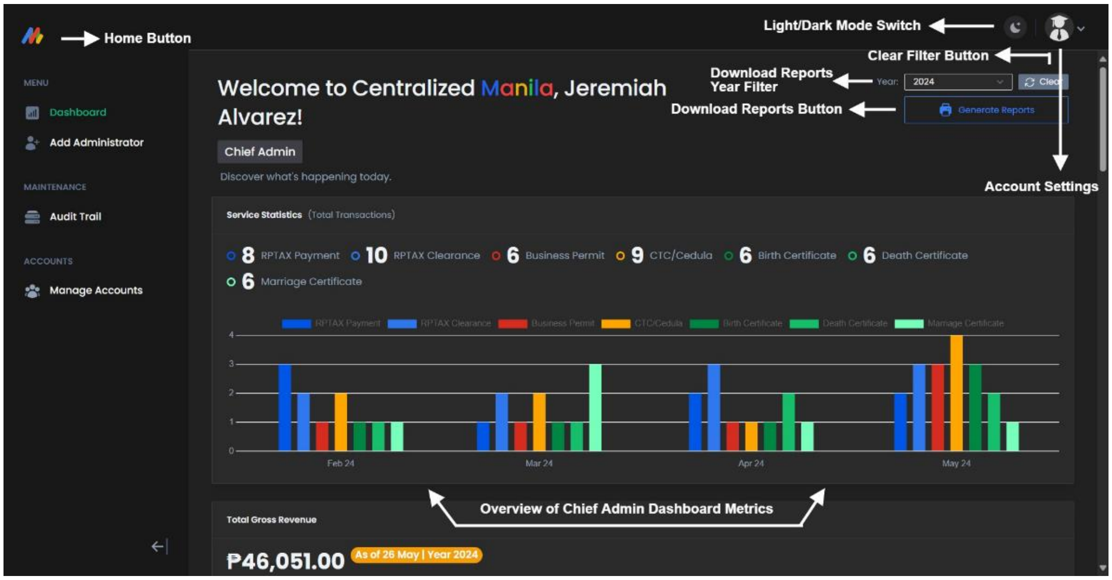

Figure 14. Chief Admin Dashboard Page

Figure 15 shows the Add Administration page which is only visible to the Chief Admin. In this page, the chief admin can add a new admin account to the system. A notable button labeled "Generate Stronger Password button" allows the admin to generate a password containing different symbols. Moreover, the user can select from the dropdown which admin type the new admin will be which includes RP Tax Admin, Business Permit Admin, CTC/Cedula Admin, Local Civil Registry Admin, and Registry Admin.

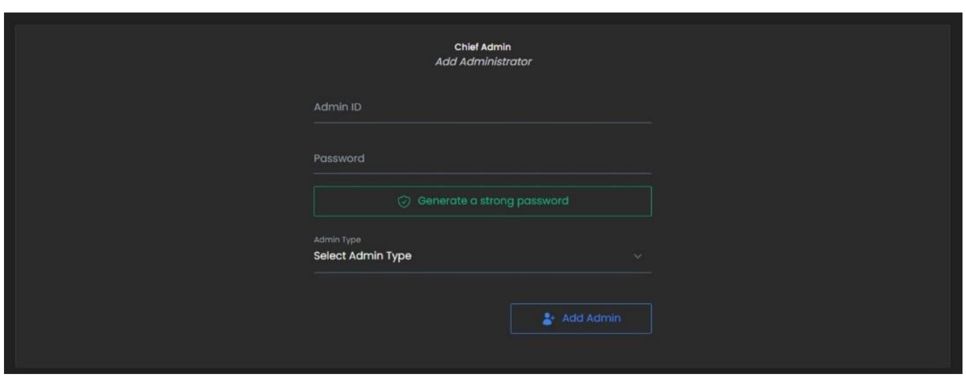

Figure 15. Add Administrator Page

Figure 16 shows the audit trail page visible only to the Chief Admin. It displays the activities committed by the other admins with details such as time stamp, admin, activity, date, identification number and changes. The user can also use the filter button to refine and narrow down the displayed information. Clicking the "clear" button resets any applied filter.

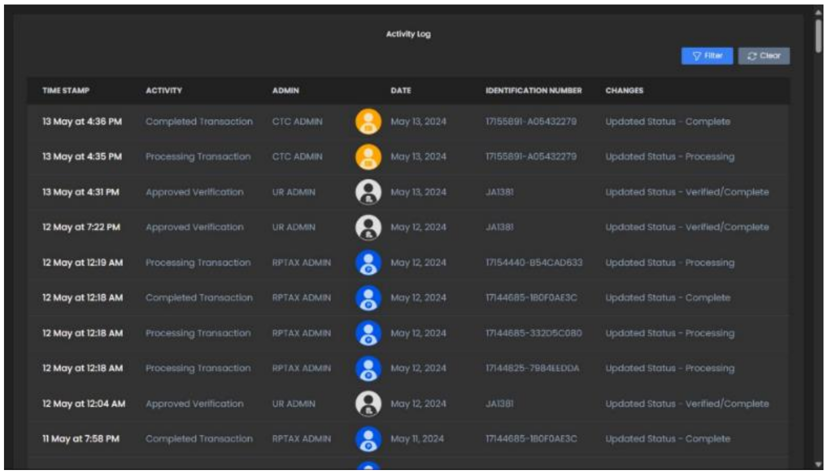

Figure 16. Audit Trail Page

Figure 17 shows the list of admin and other information. The Chief Admin can view all the admins that are in the system. The table is labeled with admin username, admin type, name of admin. Also, they can also view the information and other credentials of all admins by the eye symbol.

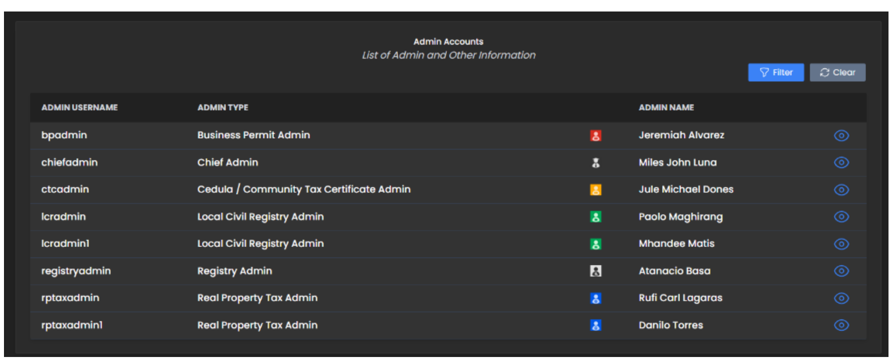

Figure 17. List of Admin and Other Information

Figure 18 shows the admin profile information which contains the information and credentials of a specific admin has. The Chief Admin can edit the credentials of a specific user by clicking the edit admin button. The avatar and admin information page is provided to easily identify the admin.

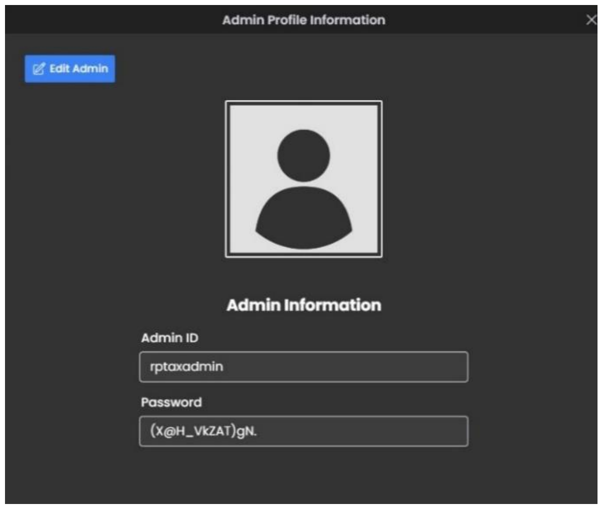

Figure 18. Admin Profile Information

Figure 19 shows the dashboard page for the Registry Admin. The page displays a welcome banner containing the name of the admin, as well as his/her role. The dashboard displays the user registry (total number of users), as well as the top locations of users which includes regions, provinces, and cities.

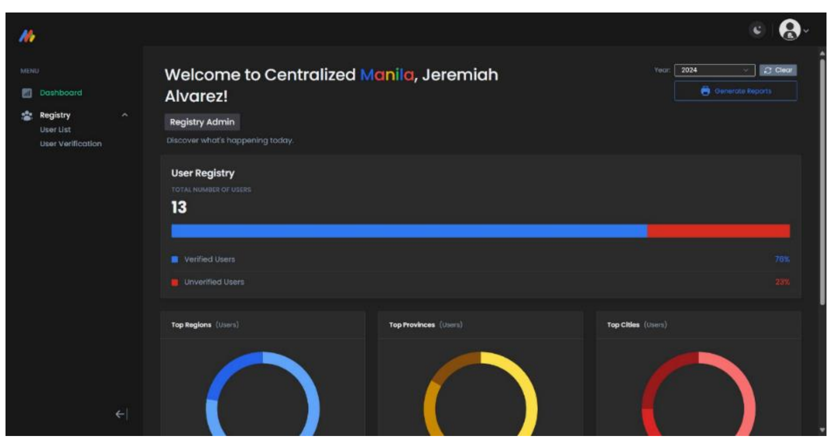

Figure 19. Registry Admin Dashboard Page

Figure 20 shows the user list under the registry page for the Registry Admin. This displays the list of users and their information, as well as their verification status. By clicking the eye icon, the admin can view other information of the user.

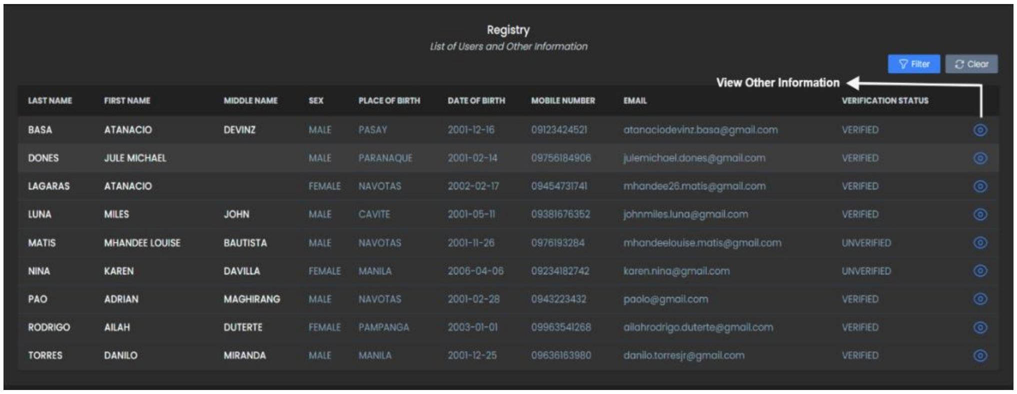

Figure 20. User List Page

Figure 21 shows the user profile information where personal information, contact information, and government information of the user is displayed. The profile picture and textboxes containing the details of the user allowed the admin to identify the important information of the user. Also, the admin can edit details by clicking the "edit user" button.

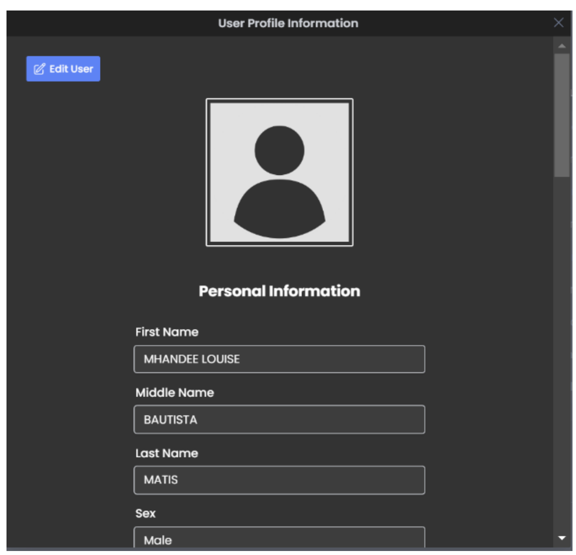

Figure 21. User Profile Information

Figure 22 shows the user verification requests where personal details of the user who applied for verification are displayed. The admin can either "decline" or "approve" a verification request. By clicking "view full details", the admin can view the user profile information. The user is already provided with the preview of the important details of the client to easily determine the transaction.

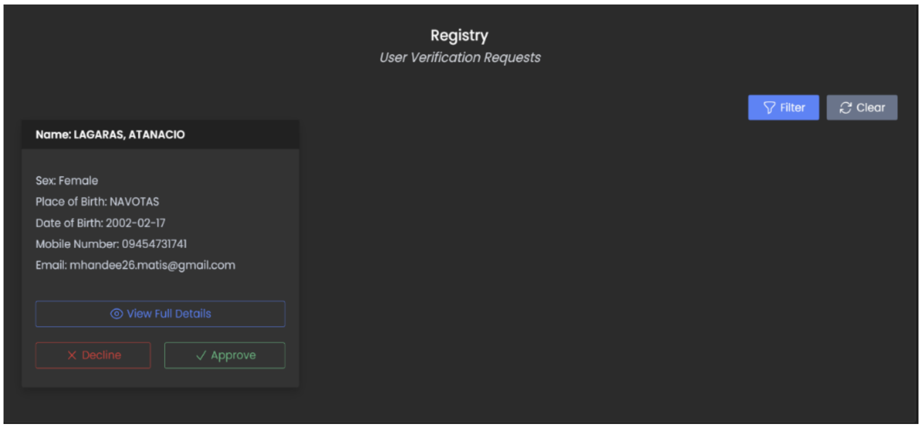

Figure 22. User Verification Page

Figure 23 shows the dashboard page for the RP Tax Admin. The dashboard displays total gross revenue, total transactions for RP Tax Payments, Tax Clearances, and Top locations of users which includes regions, provinces, and cities.

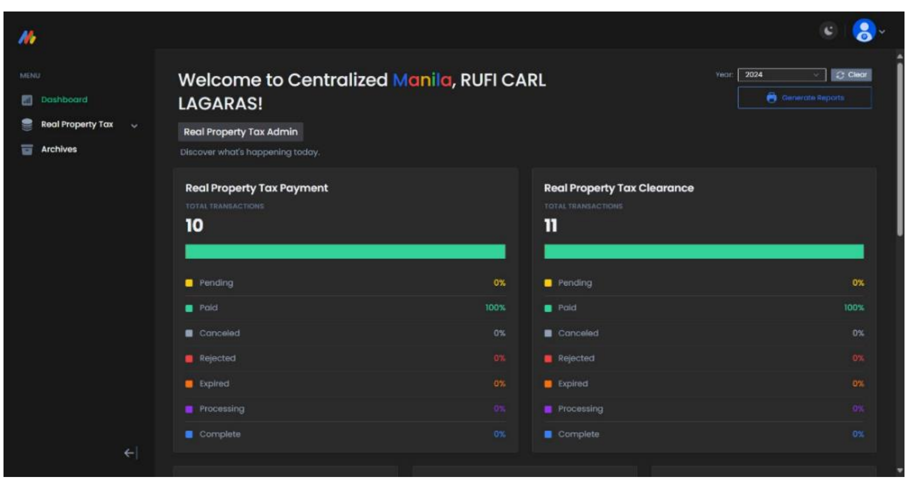

Figure 23. RP Tax Admin Dashboard Page

Figure 24 shows the tax charges page under the RP Tax for the RP Tax Admin. The left side contains the details of the transaction submitted by the user, while on the right side, it contains an input field for the amount to be paid by the user. A note was also provided which instructs the user. This dual perspective allowed the admin to easily view and process the transaction.

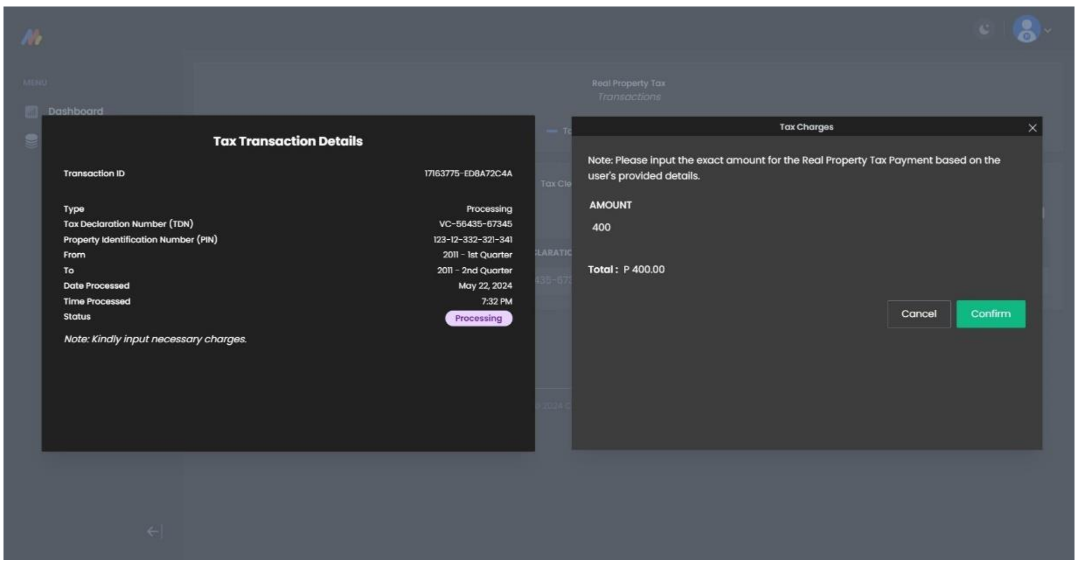

Figure 24. RP Tax – Tax Charges Page

Figure 25 shows the awaiting payments page under the RP Tax for the RP Tax Admin. The enabled the admin to view the details of the transaction. The color legend together with its description allows the admin to easily identify the type of transaction.

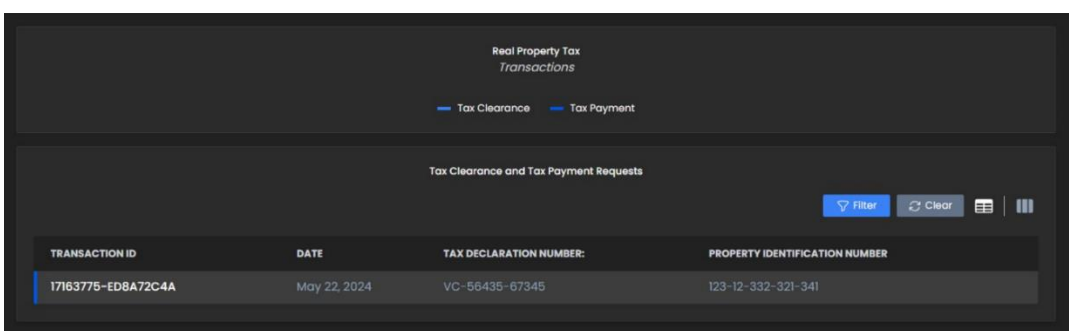

Figure 25. RP Tax Awaiting Payments Page

Figure 26 shows the processing page under the RP Tax for the RP Tax Admin. The admin can complete a transaction after reviewing its details. The check symbol allowed the user to efficiently process a transaction.

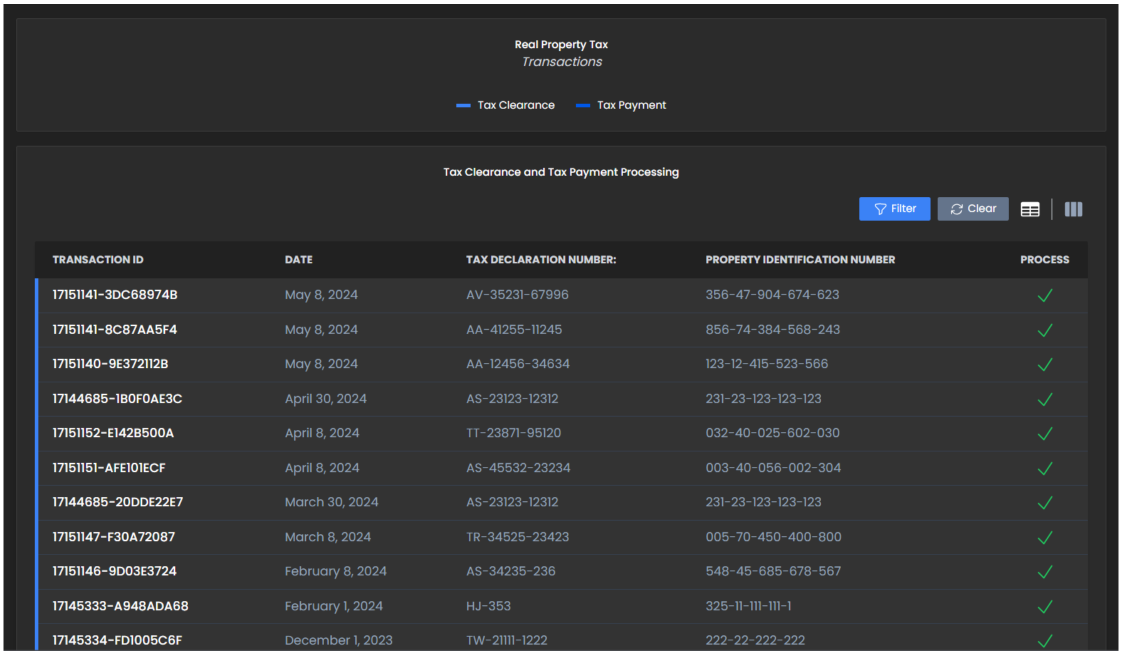

Figure 26. RP Tax Processing Section Page

Figure 27 shows the archives page of the RP Tax admin. RP Tax admins can view all the archived transactions on this page. This feature provides as the record-keeping system for all the transactions with cancelled, expired, rejected, and completed status.

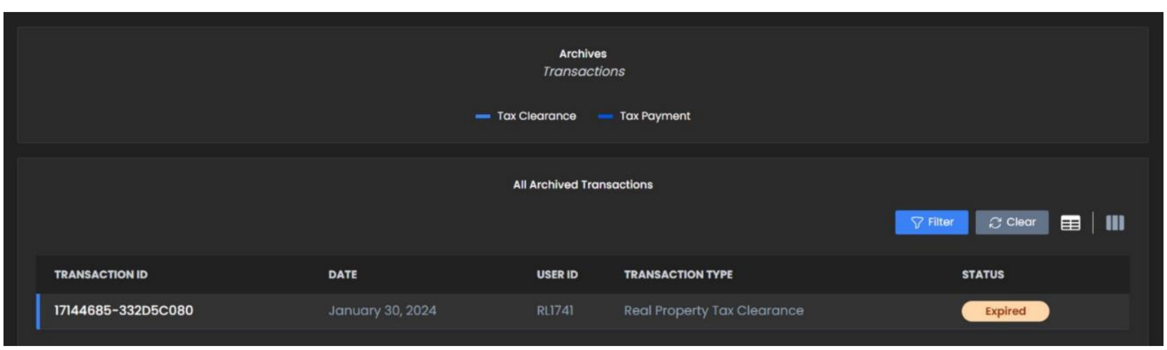

Figure 27. *RP Tax* Archives

Figure 28 shows the dashboard page for the Business Permit Admin. The web application included a dashboard for the business permit transactions which displays total gross revenue, total transactions for Business Pemit, and Top locations of users which includes regions, provinces, and cities. This enabled the Business Permit Admin to be supplied with relevant graphs and charts according to the Business Permit transactions created within the system.

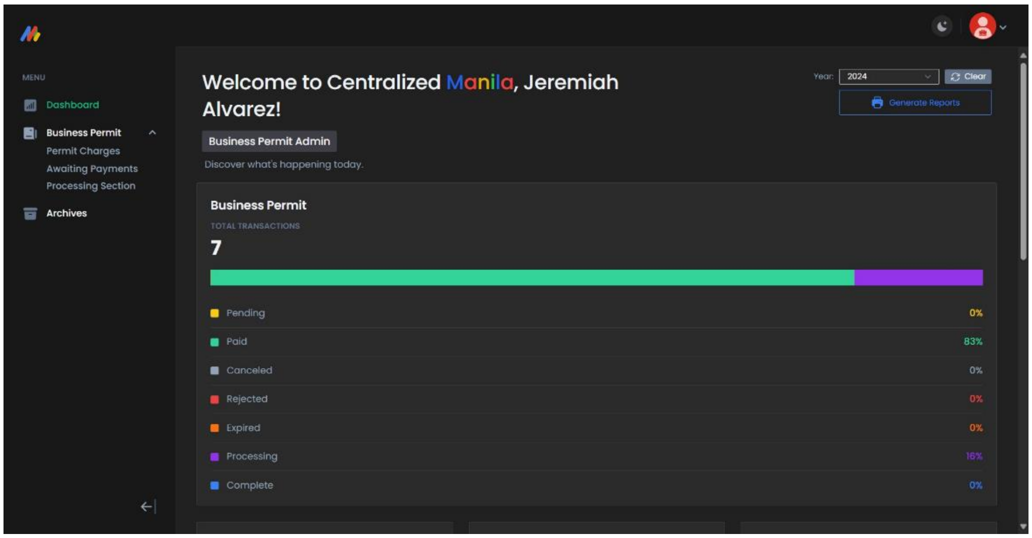

Figure 28. Business Permit Admin Dashboard Page

Figure 29 shows the business permit charges page under the Business Permit for the Business Permit Admin. The left side contains the details of the transaction submitted by the user, while on the right side, it contains an input field for the amount to be paid by the user. A note was also provided which instructs the user. This dual perspective allowed the admin to easily view and process the transaction.

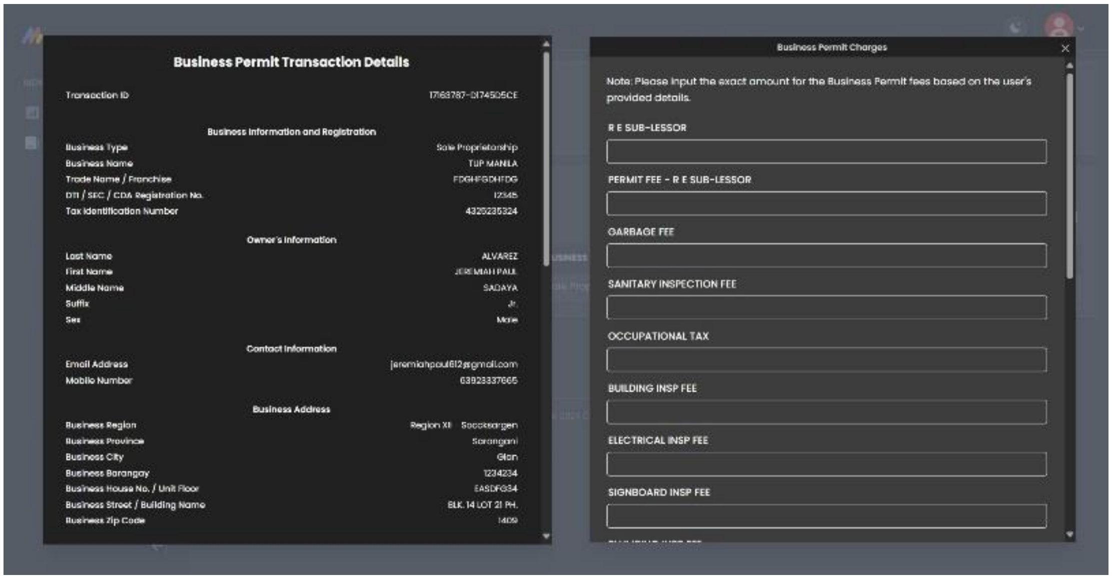

Figure 29. Business Permit – Permit Charges Page

Figure 30 shows the awaiting payments page under the Business Permit for the Business Permit Admin. The enabled the admin to view the details of the transaction. The color legend together with its description allows the admin to easily identify the type of transaction.

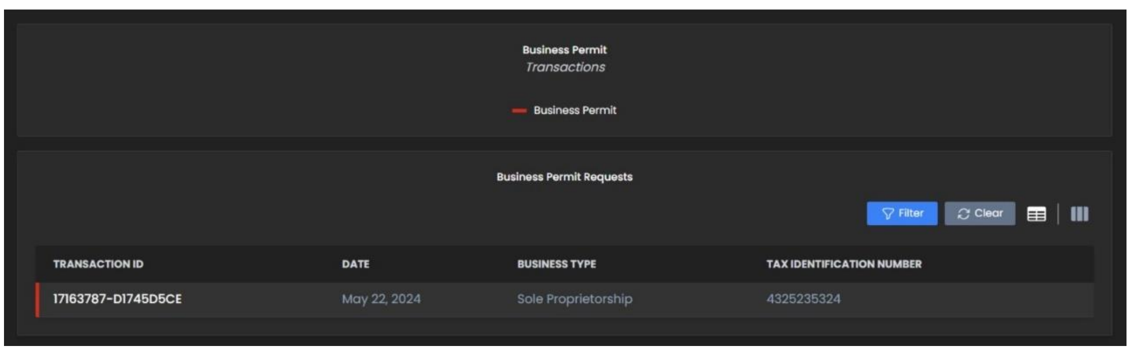

Figure 30. *Business Permit* Awaiting Payments Page

Figure 31 shows the processing page under the Business Permit for the Business Permit Admin. The admin can complete a transaction after reviewing its details. The check symbol allowed the user to efficiently process a transaction.

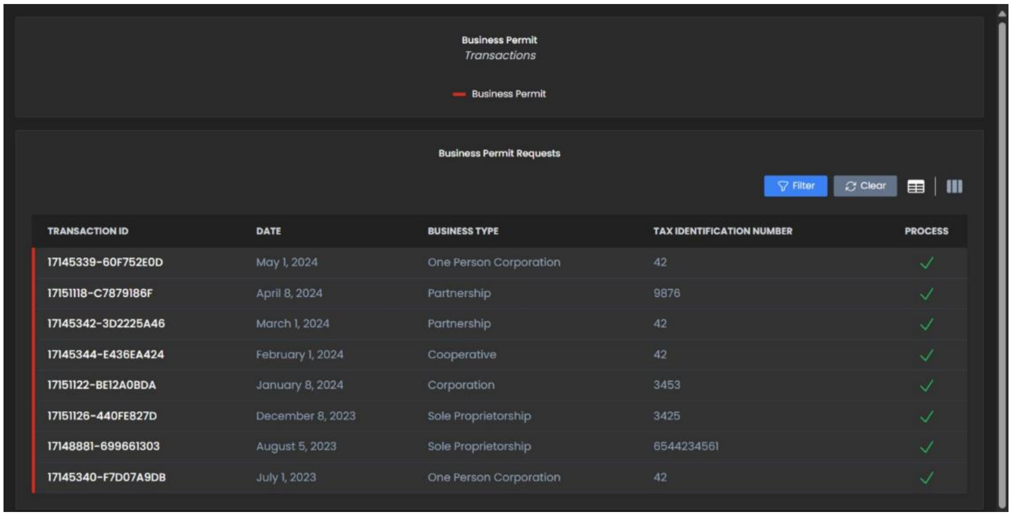

Figure 31. Business Permit Processing Section Page

Figure 32 shows the archives page of the business permit admin. Business Permit admins can view all the archived transactions on this page. This feature provides as the record-keeping system for all the transactions with cancelled, expired, rejected, and completed status.

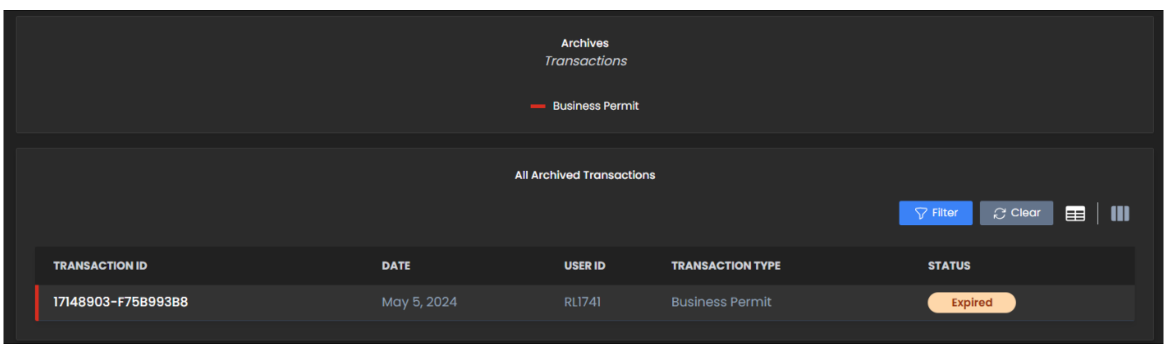

Figure 32. Business Permit Archives

Figure 33 shows the dashboard page for the Cedula Admin. The dashboard displays total gross revenue, total transactions for CTC/Cedula and Top locations of users which includes regions, provinces, and cities. This enabled the CTC/Cedula Admin to be supplied with relevant graphs and charts according to the CTC/Cedula transactions created within the system.

Figure 33. CTC/Cedula Admin Dashboard Page

Figure 34 shows the transaction requests page under the CTC/Cedula for the CTC/Cedula Admin. It displays details like transaction ID, date, last name, and first name of the user. Moreover, he/she can reject or process a transaction after reviewing its details. This table format is designed to display all important details submitted by the user.

TRANSACTION ID	DATE	LAST NAME	FIRST NAME	REJECT	PROCESS
17047868-CCA552F32	February 25, 2023	HERNANDEZ	ALEJANDRO	✕	✓
17047883-51B7F99E3	March 20, 2023	CRUZ	FATIMA	✕	✓
17047884-AFA5CB3FE	May 25, 2023	PUING	ALBERTO	✕	✓
17047885-804EF01E1	June 9, 2023	ALEJANDRINO	RENCE AARON	✕	✓

Figure 34. CTC/Cedula Transaction Requests Page

Figure 35 shows the processing page under the CTC/Cedula for the CTC/Cedula Admin. The admin can reject or complete a transaction after reviewing its details. The "check" and "x" symbol allowed the user to efficiently process a transaction.

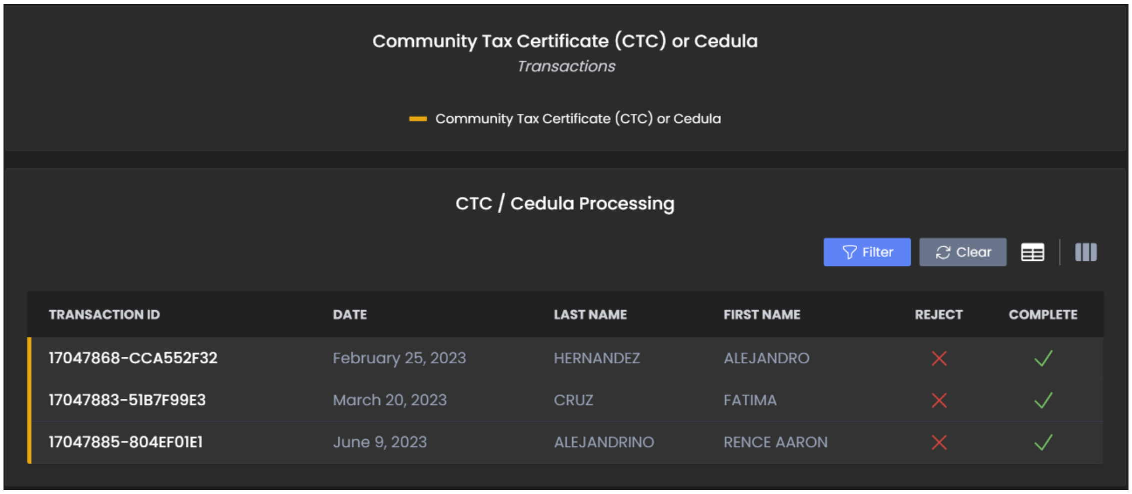

Figure 35. CTC/Cedula Permit Processing Section Page

Figure 36 shows the archives page of the CTC/Cedula admin. CTC/Cedula admins can view all the archived transactions on this page. This feature provides as the record-keeping system for all the transactions with cancelled, expired, rejected, and completed status.

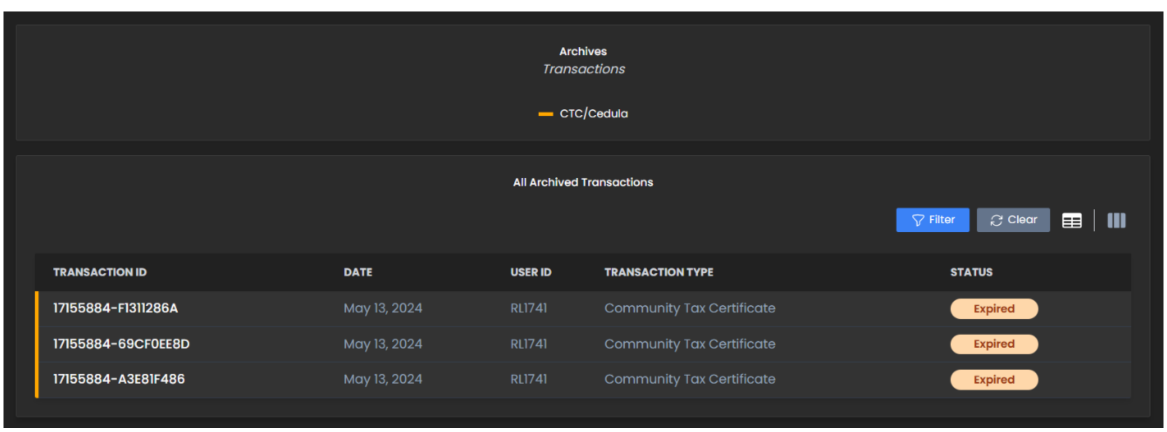

Figure 36. CTC/Cedula Archives

Figure 37 shows the dashboard page for the Local Civil Registry Admin. The dashboard displays total gross revenue, total transactions for Birth Certificate, Death Certificate, and Marriage Certificate and Top locations of users which includes regions, provinces, and cities. This enabled the CTC/Cedula Admin to be supplied with relevant graphs and charts according to the CTC/Cedula transactions created within the system.

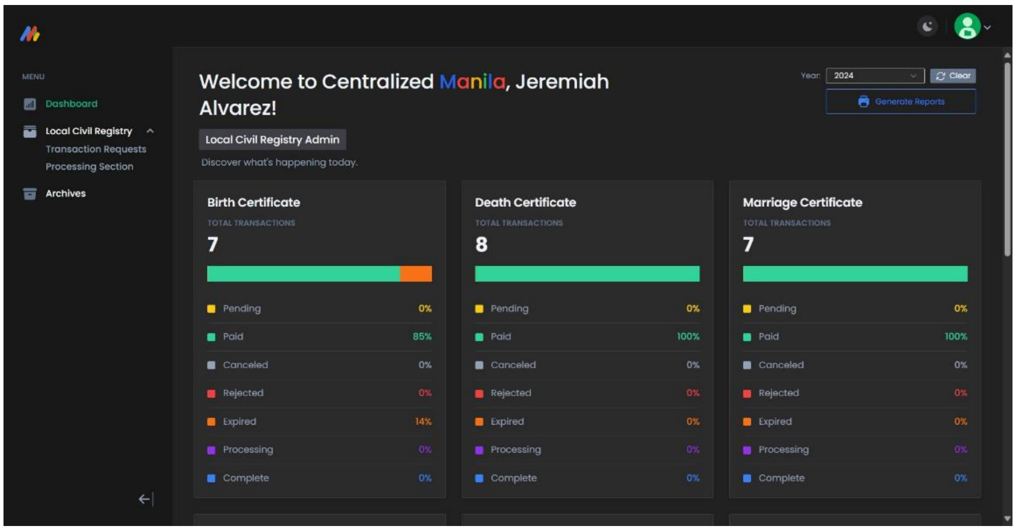

Figure 37. Local Civil Registry Admin Dashboard Page

Figure 38 shows the transaction requests page under the Local Civil Registry for the Local Civil Registry Admin. It displays details like transaction ID, date, last name, and first details. This table format is designed to display all important details submitted by the user.

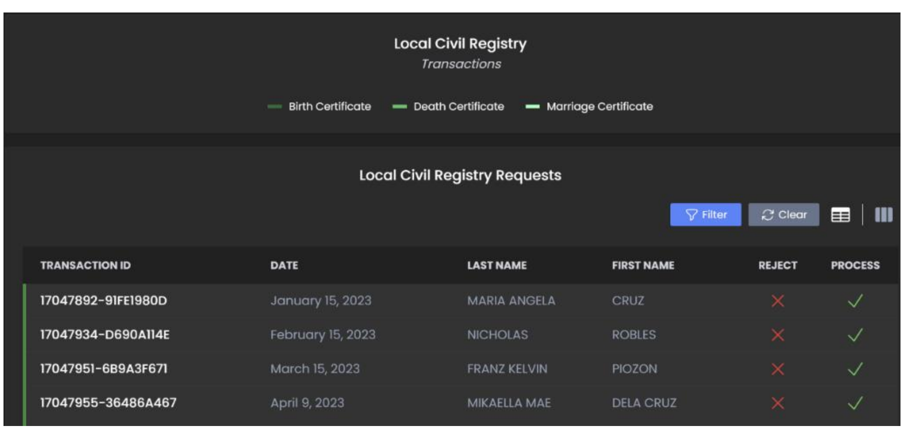

Figure 38. Local Civil Registry Transaction Requests Page

Figure 39 shows the processing page under the Local Civil Registry for the Local Civil Registry Admin. The admin can reject or complete a transaction after reviewing its details. The “check” and “x” symbol allowed the user to efficiently process a transaction.

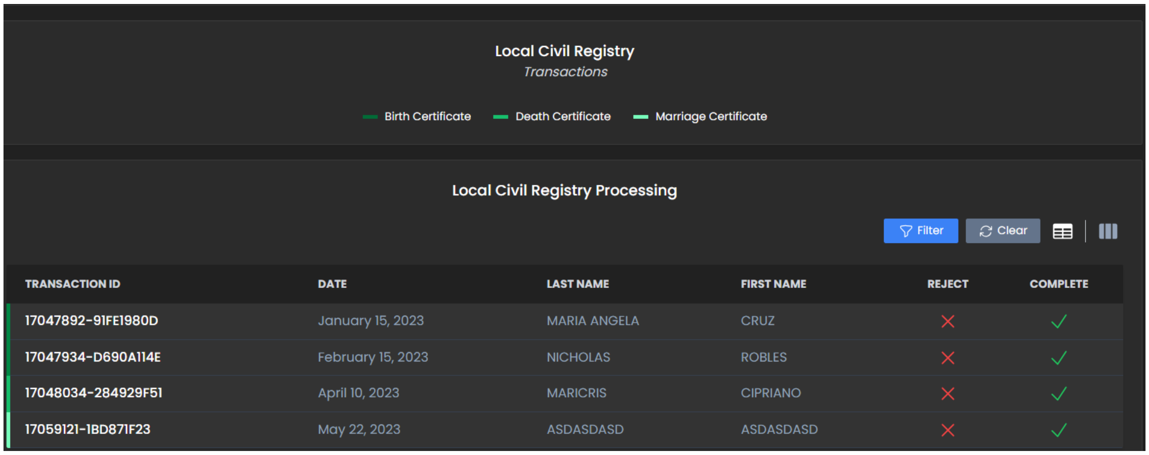

Figure 39. Local Civil Registry Processing Section Page

Figure 40 shows the archives page of the Local Civil Registry Admin. Local Civil Registry Admins can view all the archived transactions on this page. This enabled the Local Civil Registry Admin to be supplied with relevant graphs and charts according to the CTC/Cedula transactions created within the system.

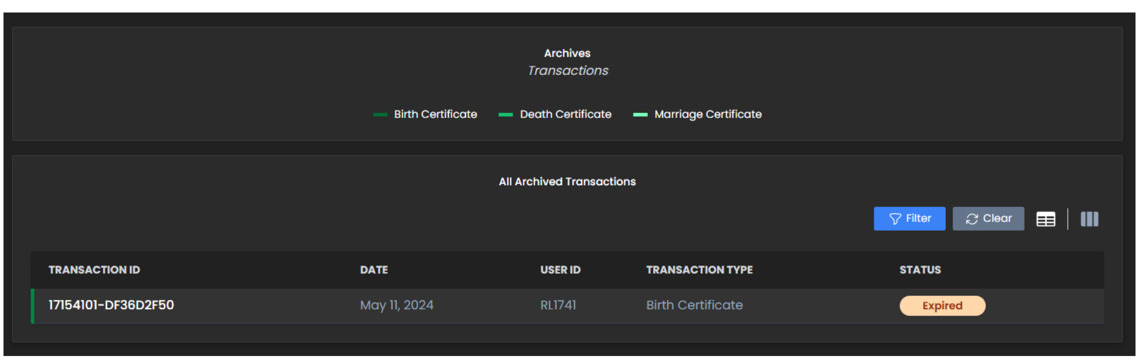

Figure 40. Local Civil Registry Archives

For citizens:

Figure 41 shows the login page for the citizens. The user must provide their Mobile Number and Password they provided when they registered their account. The landing page was designed to provide users with a variety of login methods like Google and Facebook. Also, text labels like “forgot password” and “register here” assist the user when logging in.

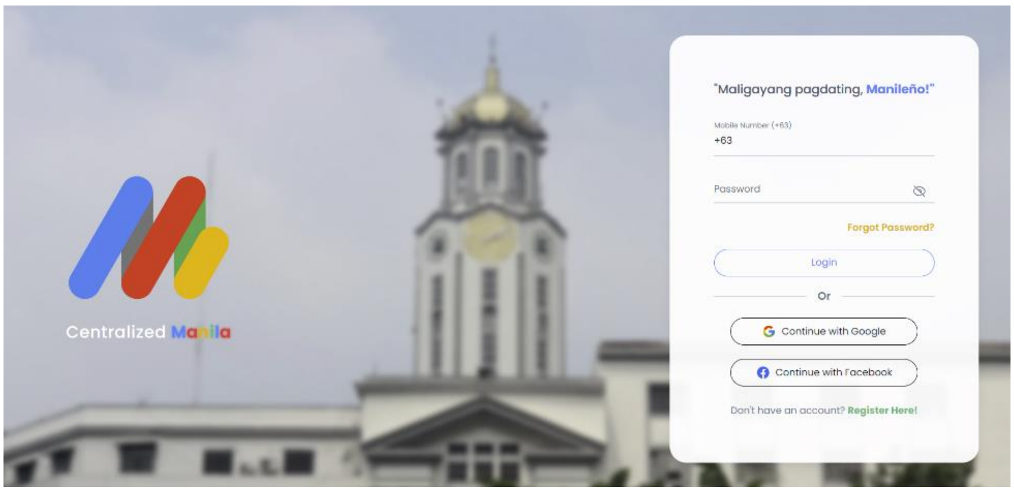

Figure 41. User Login Page

Figure 42 shows the forgot password page of the user side. This page was designed to provide users with an input field for their mobile number. A short description guides the user to provide a linked mobile number to an existing account. Users can change their password by providing the mobile number of their account and continue changing their password after entering the OTP they received with the corresponding number.

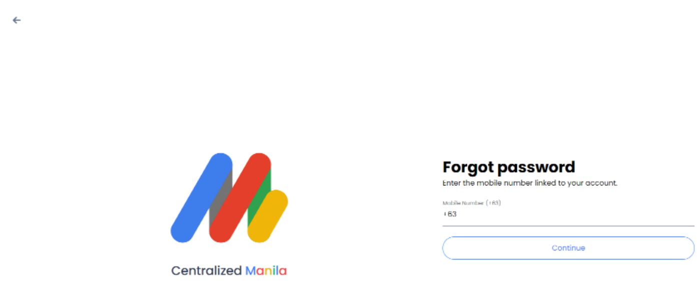

Figure 42. User Forgot Password Page

Figure 43 shows the registration page. This page is designed to gather all necessary personal details of the user. Users must fill up all input fields with their information to create their account. The mobile number and password they entered will be the credentials needed for them to log in. A password guideline helps the user in creating an ideal password for their account.

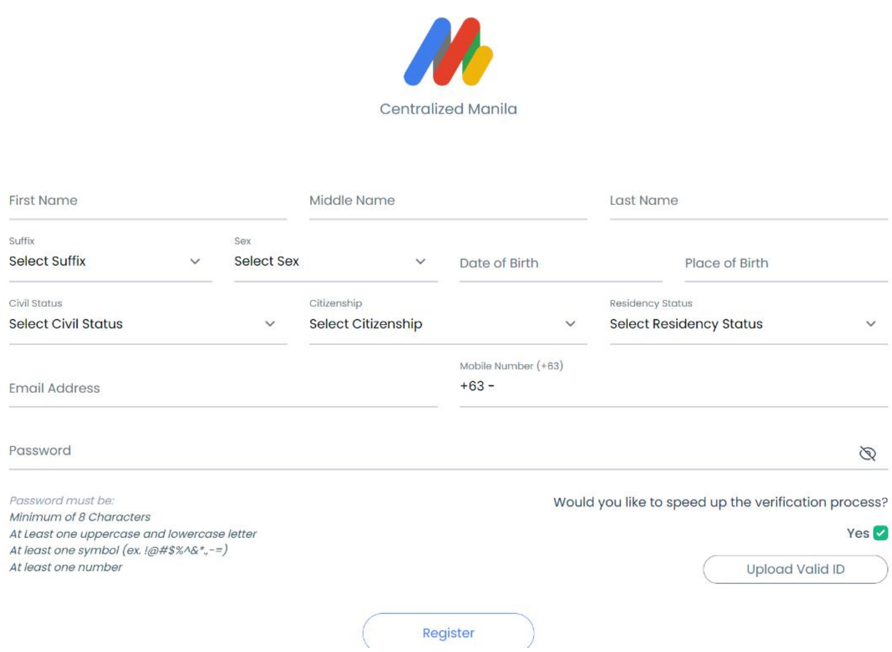

Figure 43. User Registration Page

Figure 44 shows the general interface of the user when logged in. Upon logging in, a detailed description of the services offered by the system was supplied to the user as he/she explores the system. The sidebar is where the user can access the different forms that they can use to create transactions. They can also access the profile pages to modify their personal information. The AI Chatbot is a feature that allows users to get answers to their inquiries related to the system. The header contains the button that allows them to change from light mode and dark mode. It also contains a notification button that allows users to see the updates they have in their transactions. The header also contains the account settings wherein users can modify and verify their account.

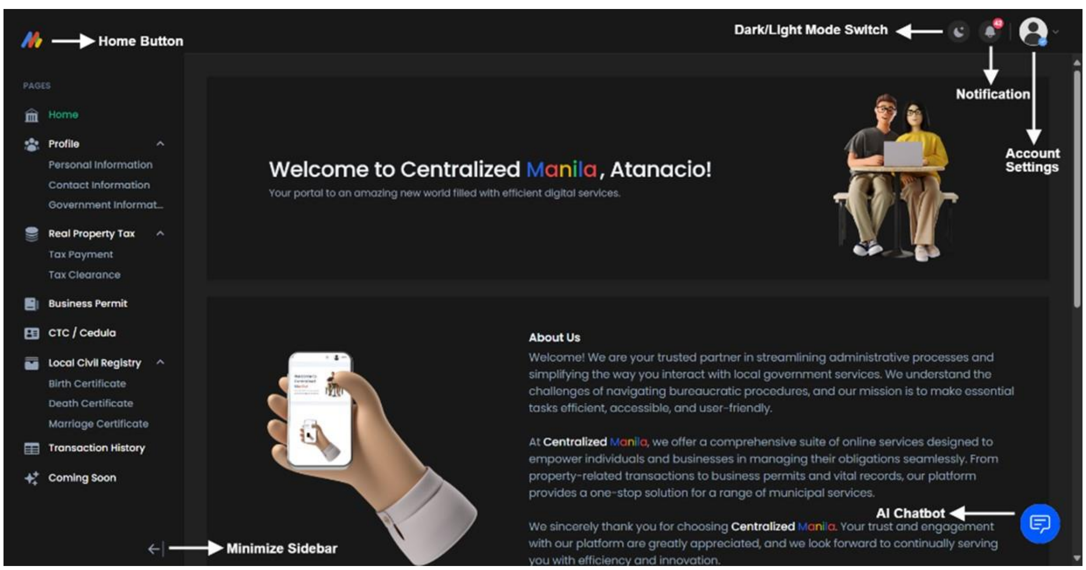

Figure 44. User General Interface

Figure 45 shows the notifications dropdown. Users can see the updates they have regarding their current and previous transactions. This feature was designed to inform the user regarding the status of their transaction, as well as their verification status. A notification will be sent to the user when an admin processed their transaction. By providing a real-time notification feature, it keeps the users engaged with the platform and updates them with relevant information.

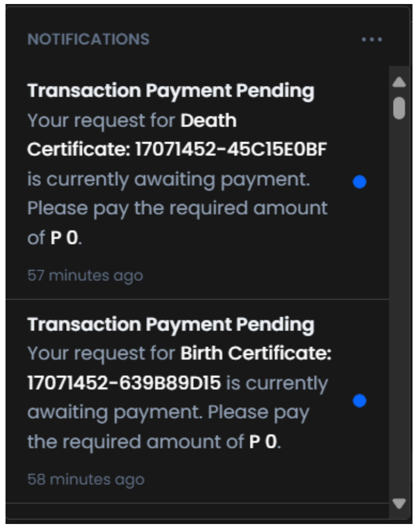

Figure 45. Notification Dropdown

Figure 46 shows the user settings webpage. Users can change their profile picture here, as well as the passwords they use to access their account when logging in. They can also delete their account on this page and apply for verification

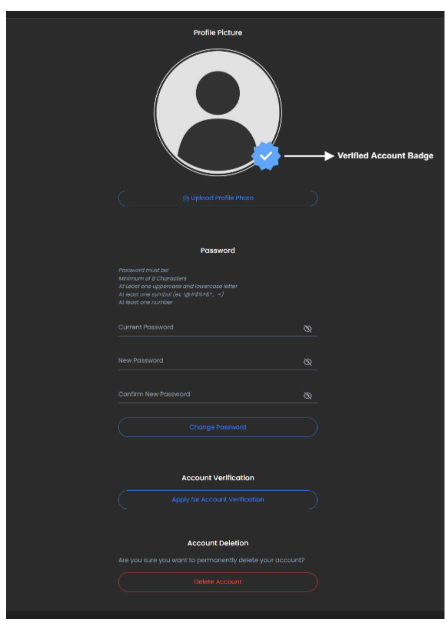

Figure 46. User Settings Page

In Figure 47, users can upload their ID to apply for verification, allowing them to use the services the system offers. It also provides instructions about the verification process.

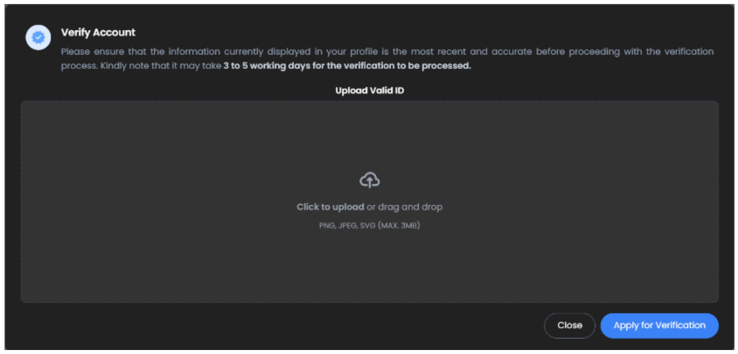

Figure 47. User Apply for Verification Modal

Figure 48 shows the home page of the user. In this page, users can read the "about us" which gives them an overview of the system. Moreover, it displays a clear description of every service the system provides.

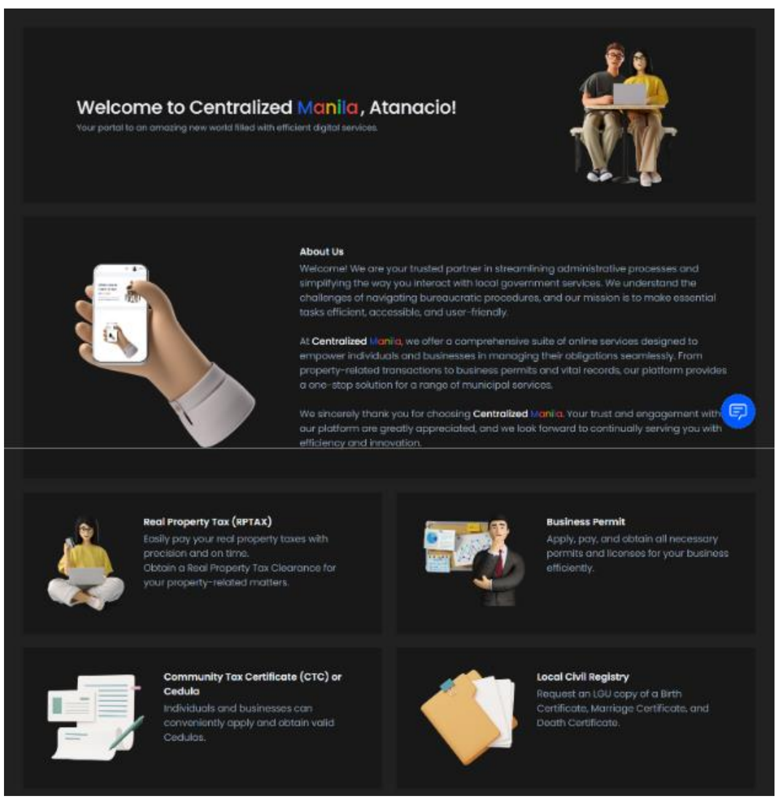

Figure 48. User Home Page

Figure 49 shows the personal information page of the user. This page was designed to provide users a platform to provide their necessary information regarding their personal details by typing in the corresponding input fields. Users can view and edit their personal information on this page such as first name, middle name, last name, etc.

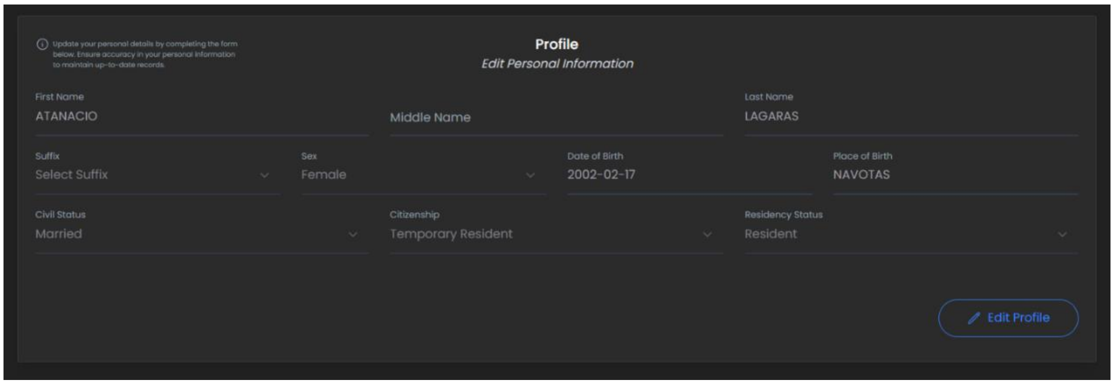

Figure 49. User Edit Personal Information Page

Figure 50 shows the contact information page of the user. This page was designed to provide users a platform to provide their necessary information regarding their contact details by typing in the corresponding input fields. Users can view and edit their contact information on this page such as their email, address, mobile number, etc.

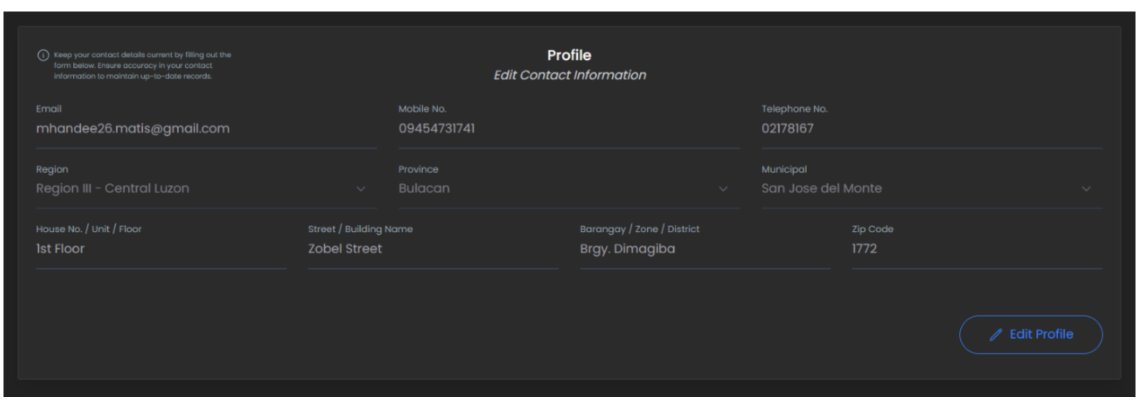

Figure 50. User Edit Contact Page

Figure 51 shows the government information page of the user. This page was designed to provide users a platform to provide their necessary information regarding their government details by typing in the corresponding input fields. Users can view and edit their government information such as PhilHealth number, National ID number, TIN, etc.

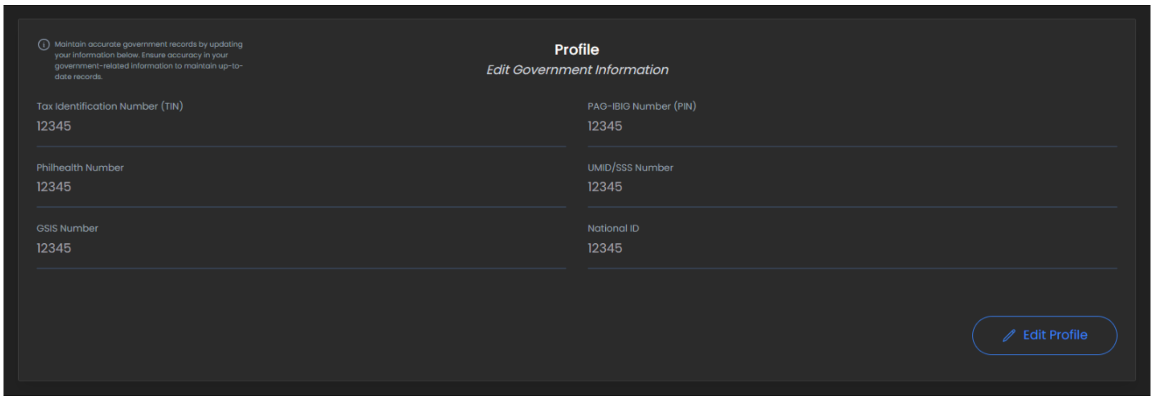

Figure 51. User Government Information Page

Figure 52 shows the access denied modal. This would block users from using the services the system offers when the account is unverified. Clicking the verify now button would redirect them into the verify account by uploading their ID.

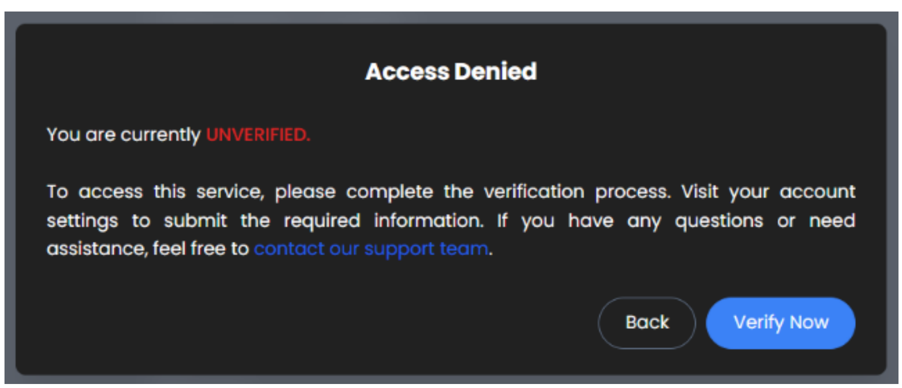

Figure 52. Access Denied Modal

Figure 53 shows terms & conditions modal. This feature was designed as a pop up modal where users can read the terms and conditions before they use the services of the system. Users need to click the checkbox to proceed through the forms.

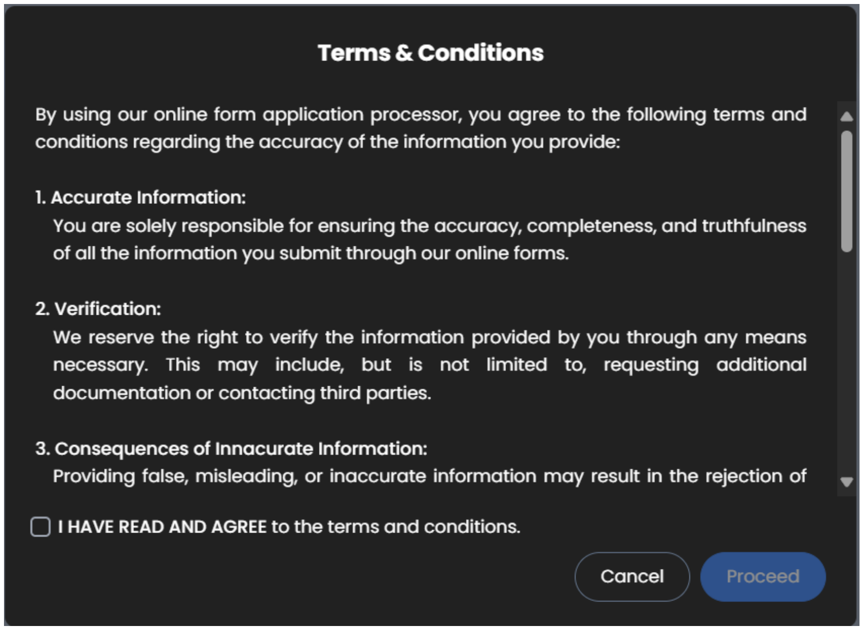

Figure 53. Terms & Conditions Modal

Figure 54 shows the real property tax payment application form page. In the header, a progress indicator shows the steps of the application which informs the user what actions were required to complete the process. The progress indicator was also visible to other services and step 2 and step 3 have the same structure. Users can fill out the input fields with their information to create a transaction in real property tax payment application form page. Users must enter their account name, tax declaration number, property identification number, year, period, and amount.

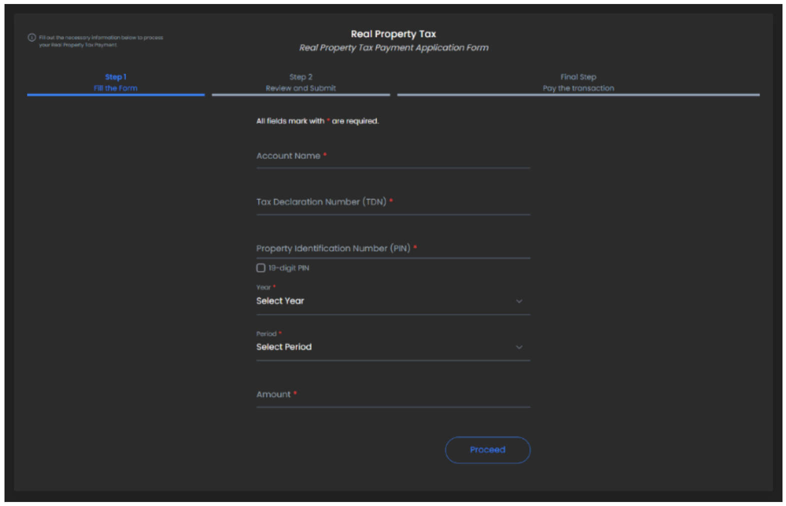

Figure 54. RP Tax Payment Step 1 Application Form

After entering all the required information and clicking the proceed button, a modal will appear, and they can review the information they entered which was shown in Figure 55.

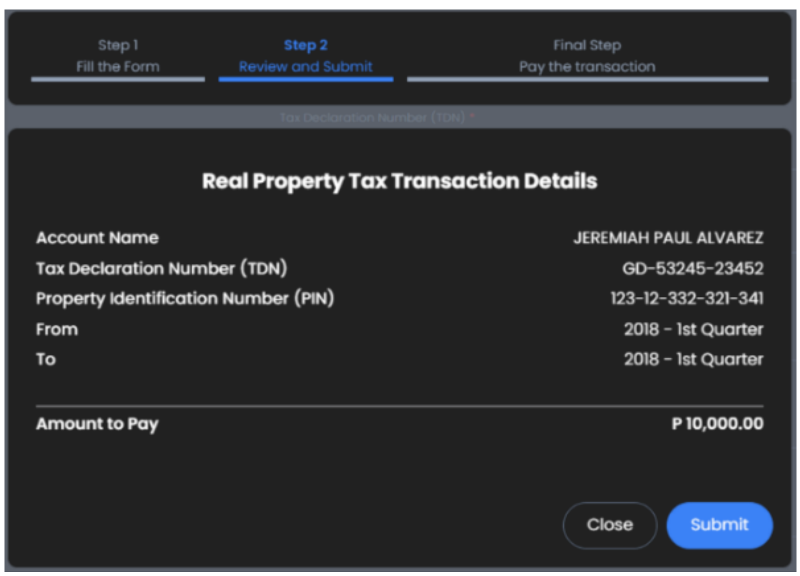

Figure 55. RP Tax Payment Step 2 Application Form

As shown in Figure 56, after they review and submit, they can view the transaction they made and see the modal with the pay button, which redirects the user to the payment webpage. Clicking the cancel transaction will cancel the pending transaction of the user. They can also view the details they entered when making the application. They can also view the details when scanning the QR code.

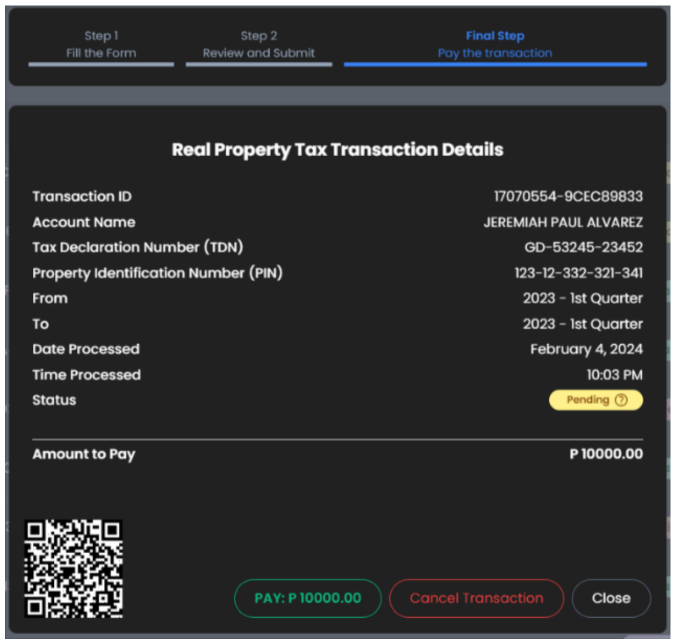

Figure 56. RP Tax Payment Step 3 Application Form

Figure 57 shows the real property tax clearance request form page. In the header, a progress indicator shows the steps of the application which informs the user what actions were required to complete the process. Users can fill up the input fields with their information to create a transaction in real property tax clearance request form page. Users must enter their tax declaration number and property identification number.

After entering all the required information and clicking the proceed button, a modal will appear, and they can review the information they entered. After they review and submit, they can view the transaction they made and see the modal with the pay button, which redirects the user to the payment webpage. Clicking the cancel transaction will cancel the pending transaction of the user. They can also view the details they entered when making the application. They can also view the details when scanning the QR code.

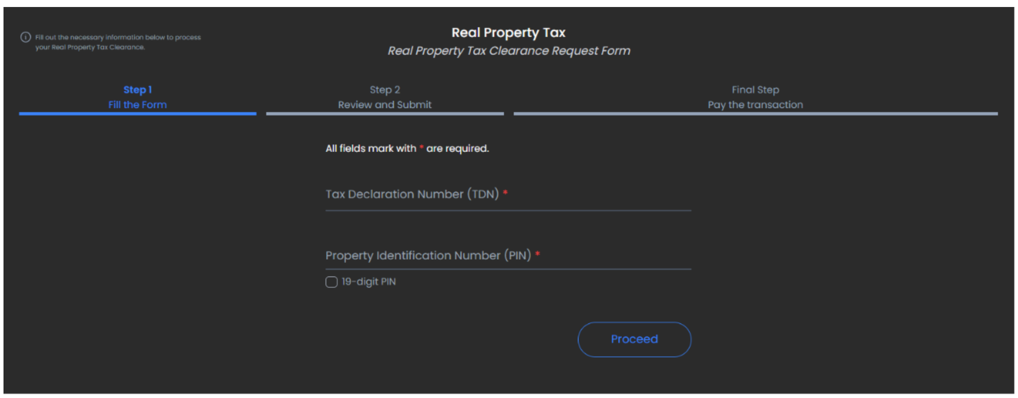

Figure 57. RP Tax Clearance Application Form

Figure 58 shows the business permit application form page. Users can fill up the input fields with their information to create a transaction in business permit. Users must enter the business information and registration, owner’s information, contact information, etc. After entering all the required information and clicking the proceed button, a modal will appear, and they can review the information they entered. After they review and submit, they can view the transaction they made and see the modal with the pay button, which redirects the user to the payment webpage. Clicking the cancel transaction will cancel the pending transaction of the user. They can also view the details they entered when making the application.

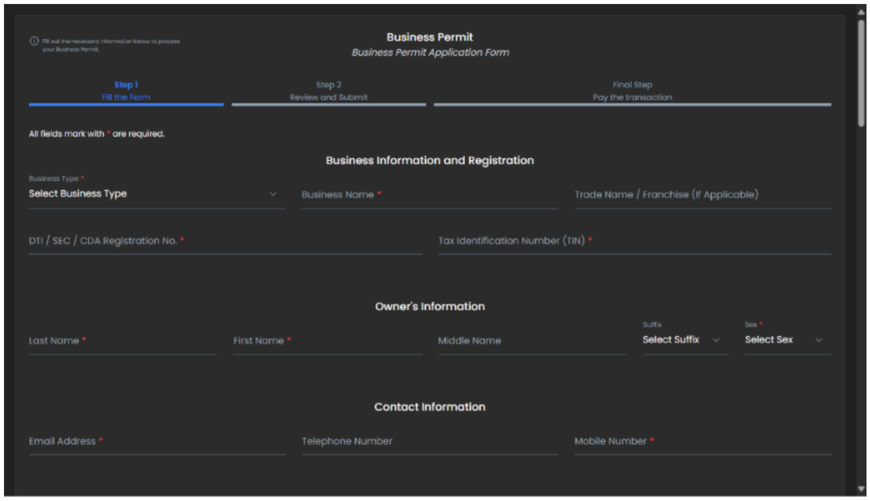

Figure 58. Business Permit Application Form

Figure 59 shows the cedula application form page. Users can fill up the input fields with their information to create a transaction in cedula. Users must enter the owner's personal information, owner's address, etc. After entering all the required information and clicking the proceed button, a modal will appear, and they can review the information they entered. After they review and submit, they can view the transaction they made and see the modal with the pay button, which redirects the user to the payment webpage. Clicking the cancel transaction will cancel the pending transaction of the user. They can also view the details they entered when making the application. They can also view the details when scanning the QR code.

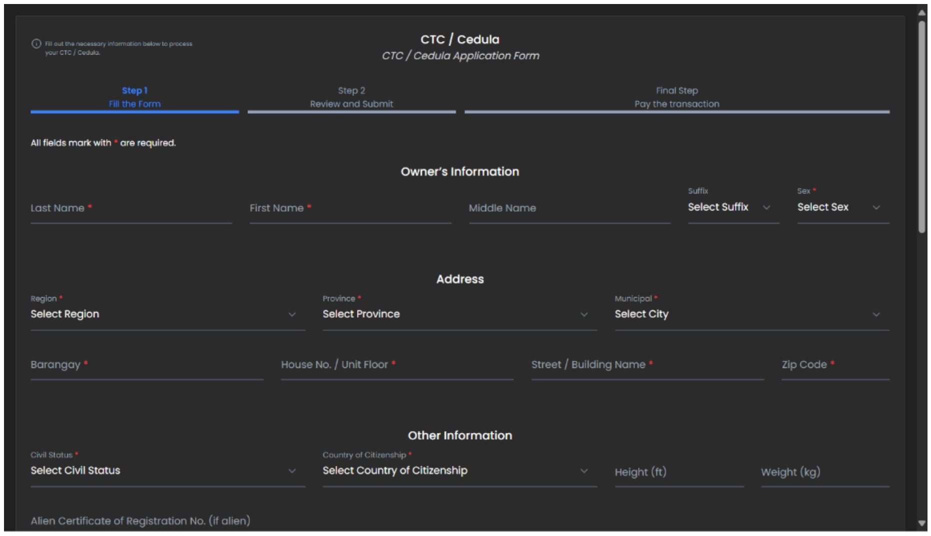

Figure 59. Cedula Application Form

Figure 60 shows the birth certificate request form page. Users can fill up the input fields with their information to create a transaction in birth permit. Users must enter the document owner's personal information, document owner's place of birth, requestor's personal information, father's personal information, etc. After entering all the required information and clicking the proceed button, a modal will appear, and they can review the information they entered. After they review and submit, they can view the transaction they made and see the modal with the pay button, which redirects the user to the payment webpage. Clicking the cancel transaction will cancel the pending transaction of the user. They can also view the details they entered when making the application. They can also view the details when scanning the QR code.

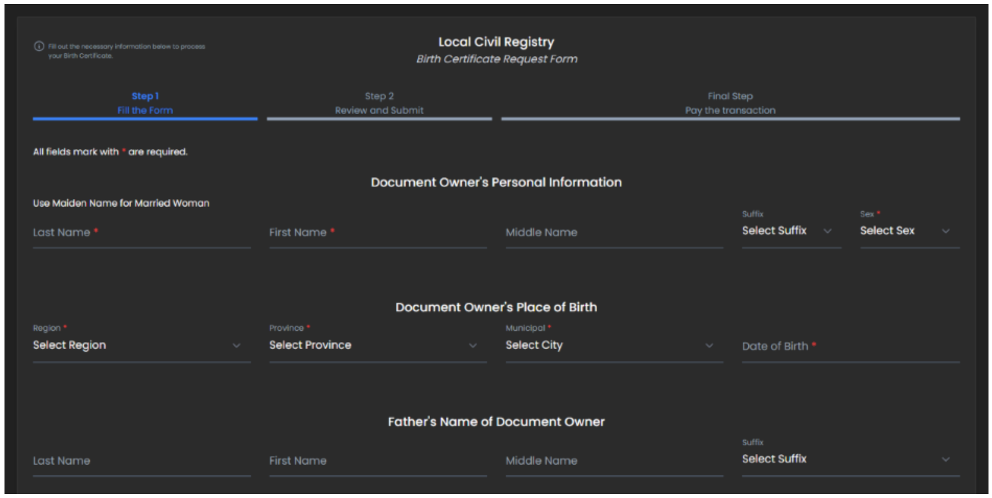

Figure 60. Birth Certificate Application Form

Figure 61 shows the death certificate request form page. Users can fill up the input fields with their information to create a transaction in death permit. Users must enter the document owner's personal information, place of death information, requestor's personal information, etc. After entering all the required information and clicking the proceed button, a modal will appear, and they can review the information they entered. After they review and submit, they can view the transaction they made and see the modal with the pay button, which redirects the user to the payment webpage. Clicking the cancel transaction will cancel the pending transaction of the user. They can also view the details they entered when making the application. They can also view the details when scanning the QR code.

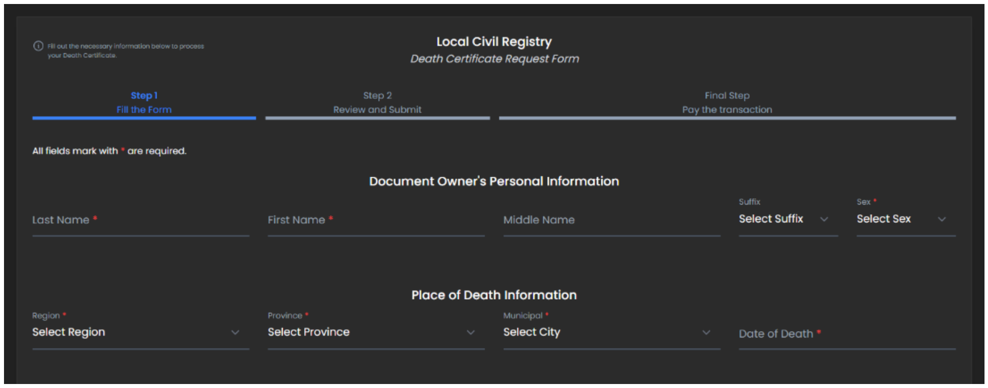

Figure 61. Death Certificate Application Form

Figure 62 shows the marriage certificate request form page. Users can fill up the input fields with their information to create a transaction in business permit. Users must enter the document owner's husband information, wife's information, etc. After entering all the required information and clicking the proceed button, a modal will appear, and they can review the information they entered. After they review and submit, they can view the transaction they made and see the modal with the pay button, which redirects the user to the payment webpage. Clicking the cancel transaction will cancel the pending transaction of the user. They can also view the details they entered when making the application. They can also view the details when scanning the QR code.

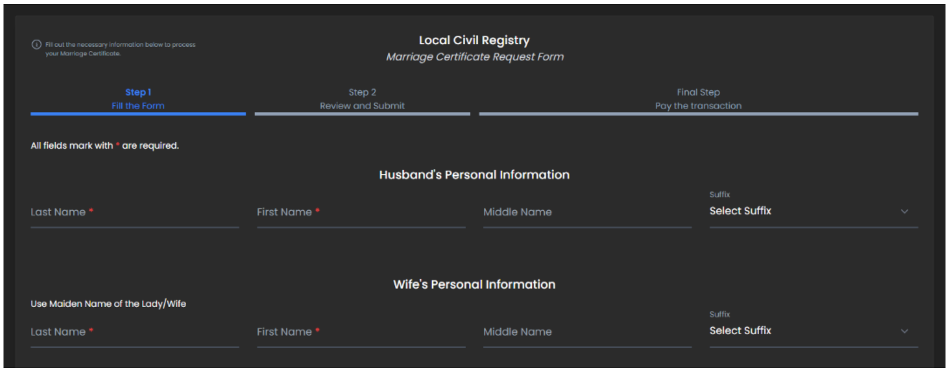

Figure 62. Marriage Certificate Application Form

Figure 63 shows the transaction history page of the user. Users can see the previous transactions they created in the system. They can also see the status of their transaction. The "pending" status means payment is still pending. The "paid" status means the transaction has been paid and can now be processed by the admin. The "canceled" status means the user canceled their transaction. The "rejected" status means an admin rejected the transaction requested by the user because of different causes such as incorrect information provided, failure in following specific requirements, etc. The "expired" status means the transaction became expired because the user failed to pay for a certain amount of time. The "processing" status means the application sent by the user is currently being processed by the admin. The "complete" status means the application sent by the user is finished and can now be claimed. Users can download their Statement of Account in the transaction history page.

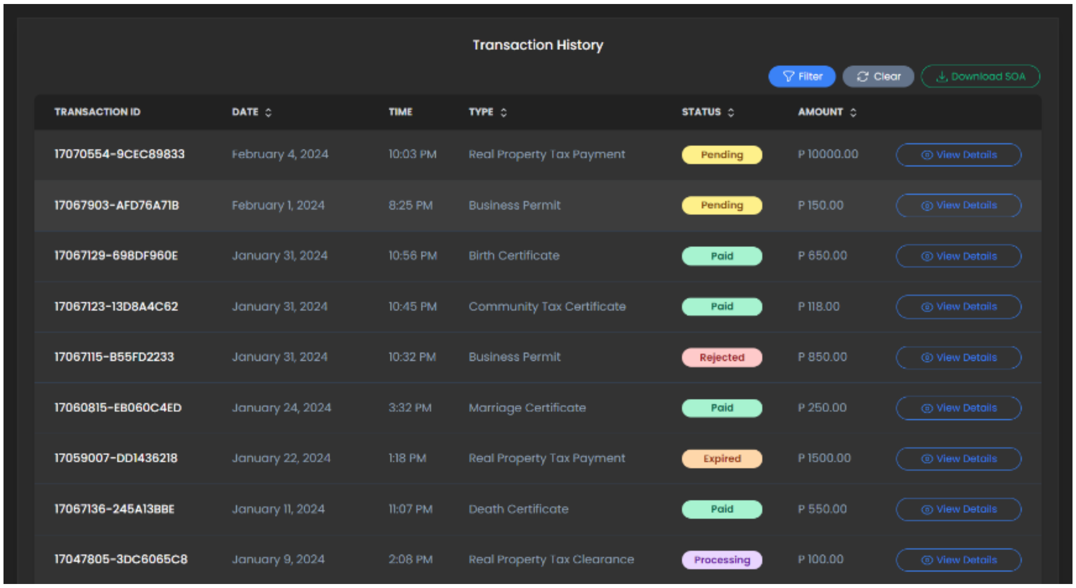

Figure 63. Transaction History Page

Figure 64 shows the filter dropdown in the transaction history which can be used by the user to search and find the specific transaction they are looking for easily. They can filter the transactions by date, transaction ID, type, and status.

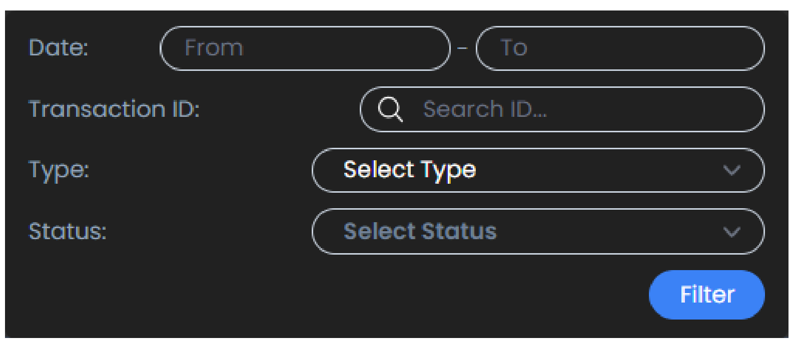

Figure 64. Transaction History Page - Filter

Figure 65 shows the payment webpage of the system. In this page, the user can pay for their pending transactions. They can choose different payment methods such as GCash, Grabpay, Maya, Online Banking, Credit Card, etc.

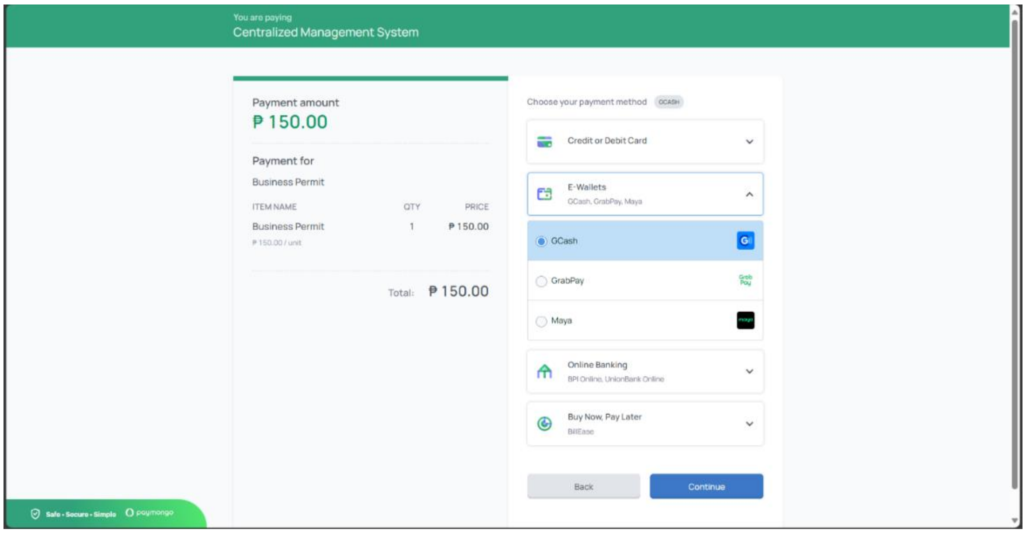

Figure 65. Payment Page

Figure 66 shows the contacts page of the system. Users can learn the location, opening and closing hours, and the email of the Manila City Hall. They can also view the location and other contacts of the different offices that users will go to as they claim the documents they applied for in the system.

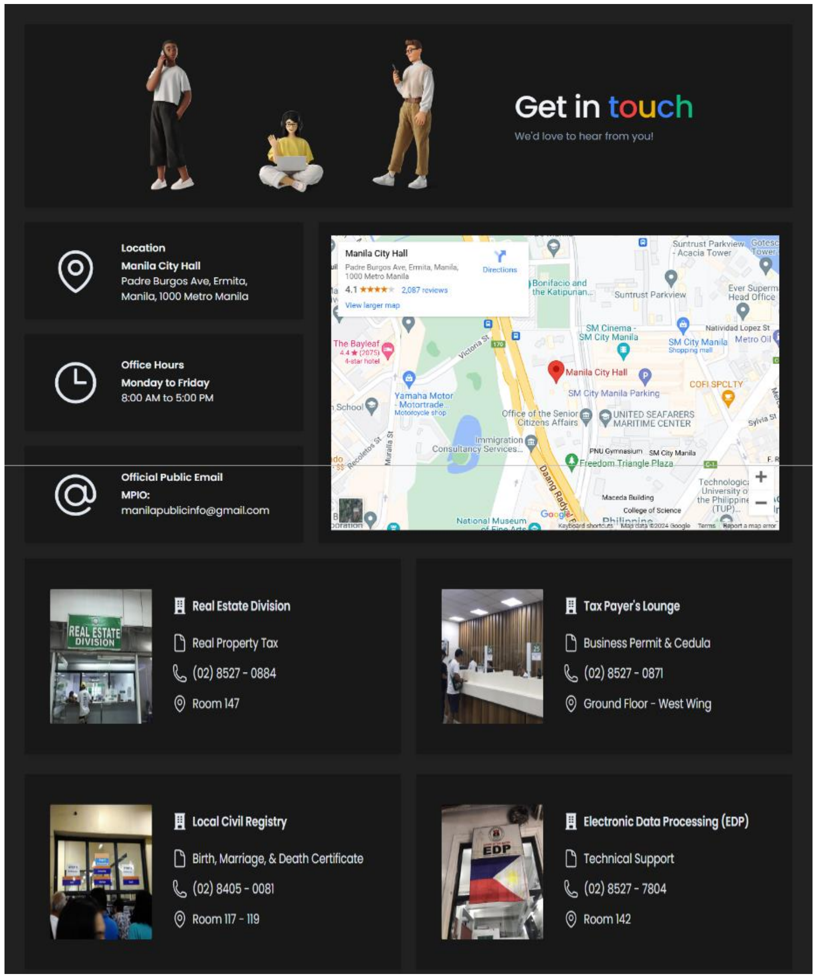

Figure 66. Contacts Page

Figure 66 shows the privacy policy page. This page contains the data privacy act that the system is committed to in following. The privacy policy page also states how the information could be collected, used, and analyzed when the user utilized the system.

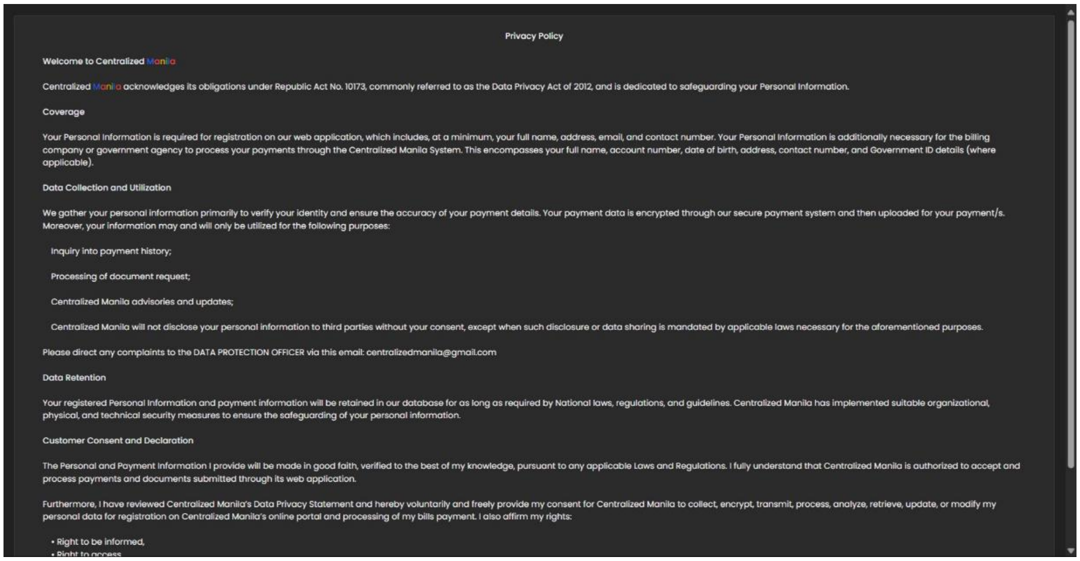

Figure 66. Privacy Policy Page

Figure 67 shows the terms and conditions page. This page contains the terms and conditions that the user must agree to before using the system.

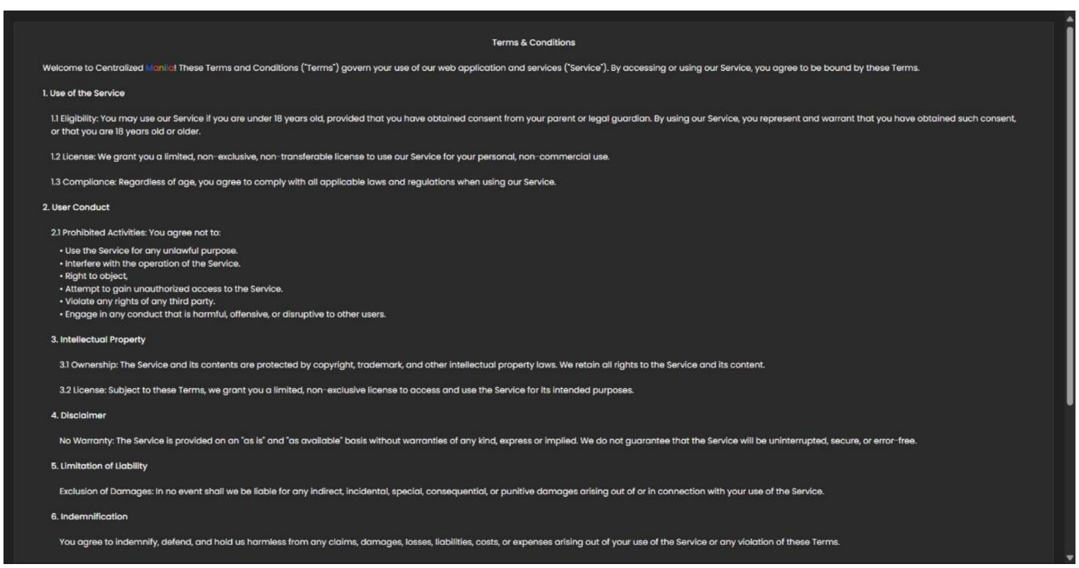

Figure 67. Terms and Conditions Page

Project Capabilities and Limitations

The developed system has the following capabilities:

1. The system provided transactions for Real Property Tax such as Tax Payments and Tax Clearance.
2. The system provided transactions for requesting a Business Permit.
3. The system provided transactions for requesting a CTC or Cedula.
4. The system provided transactions for requesting Local Civil Registry documents such as Birth Certificates, Marriage Certificates, and Death Certificates.
5. The system integrated PayMongo as its payment method.
6. The system provided a verification where users can apply to be able to access other modules of the system.
7. The system provided a transaction history where users can view their past transactions. Additionally, the system can generate Statement of Accounts which enabled users download a PDF file containing the details of the users' outstanding balance.
8. The system provided a QR code as a transaction reference where users can scan.
9. The system provided an AI assistant which answers user inquiries regarding the system.
10. The system provided a system notification and email notification feature which displays the following: (1) when the user pays for the processing of transaction, (2) once the transaction status has been updated, and (3) verification status of the user.
11. The system also featured a contact page with the following information: (1) details of the Manila City Hall including address, telephone number, and location map,

and (2) contact details where the user can receive their documents in the city hall.

12. The system provided an Admin perspective where specific admins can view transaction requests and processing section for their assigned module: CTC/Cedula for CTC/Cedula Admin, and Local Civil Registry for Local Civil Registry Admin.
13. The system provided an Admin perspective for the Real Property Tax Admin can view permit charges, awaiting payments, and processing section for their assigned module.
14. The system provided an Admin perspective for Registry Admin where the admin can view the Registry section which includes the user list and user verification.
15. The system provides an Audit Trail, Add Admins, and Manage Admins account section where the Chief Admin can see all the activity of all admins, create new admins, and oversee all admins within the system.
16. The system provides an Admin Dashboard for each admin which displays service statistics (total transactions), total gross revenue, user registry, specific total transactions for RP Tax, Business Permit, CTC/Cedula, and Local Civil Registry, and Top Regions, Provinces, and Cities for all transactions.
17. The system enabled the generation of comprehensive reports based on the presented data in the admin dashboard.
18. The system provided a filter button where the admin can filter data in the admin dashboard and each of the modules.
19. The system provided a search functionality where the admin can specifically search for a particular transaction using Transaction ID.

The developed system has the following limitations:

1. The system required internet to run and be accessed.
2. The system only had PayMongo as its payment gateway.
3. The AI Chatbot exclusively answers inquiries within the scope of the system.
4. The system does not have a feature where documents can be delivered.
5. The notifications of transaction updates were not provided in SMS but only in email and system notification.
6. The system provided each administrator a unique perspective in the system determined by their assigned modules. As a result, admins are prohibited from performing tasks outside of their specified modules. The information displayed in any administrator's dashboard was derived only from the modules assigned to them along with its corresponding reports.

Project Evaluation

This section displays the data collected during system testing in terms of functional suitability and security. The project's evaluation findings are also presented and discussed.

Functional Suitability Test Results

The system's functional suitability was tested in different test case scenarios for the different actors of the system. Table 35 shows an overview of the summary of the test cases executed for different actors of the system in terms of functional suitability.

Table 35

Overall Summary of Functional Suitability Test Cases

Use Case	No. of Test Cases
Unregistered User	7
Unverified User	36
Verified User	64
Registry Admin	18
Real Property Tax Admin	24
Business Permit Admin	24
CTC/Cedula Admin	23
Local Civil Registry Admin	23
Chief Admin	14
Total	**233**

Table 36 shows the executed testing which was done in two cycles. It also highlights the summary of the percentage of passed and failed test cases in these cycles. The first cycle of testing yielded 91% of the test cases as “passed”. A second cycle of testing is executed due to the remaining 9% which obtained ‘failed” remarks. On the second cycle, 100% of the test cases to be performed received a “passed” remarks. Appendix D contains completed test cases, while Appendix F contains failed test cases.

Table 36

Functional Suitability Test Execution Summary

Test Execution	Expected Result	Actual Result	
		Cycle 1	Cycle 2
No. of Test Cases Executed	100%	100%	100%
Results of Test Cases			
Passed	100%	91%	100%
Failed	0%	9%	0%
No. of Test Cases Not Executed	0%	0%	0%

Security Test Results

Table 37 displays the test cases summary for security. Also presented here is the objective for each of the test cases for security. Meanwhile, Table 36 shows the test execution summary for security testing. Another round of testing was executed for the second cycle as some of the tests have failed alongside the testing for functional suitability during the first cycle. In this cycle, “passed” has been remark for all test cases which indicates the successful outcome of all the testing executed. Appendix E contains the test cases for security, while Appendix F shows the failed test cases.

Table 37

Security Test Cases Summary

Test Case ID	Objective
S-001	To be able to login with valid user credentials
S-002	To be able to display error message when logging in with invalid user credentials.

S-003	To be able to set up password that meets password requirements.
S-004	To be able to display error message when creating password that doesn't meet password requirements.
S-005	To be able to login when typing valid OTP
S-006	To be able to display error message when typing invalid OTP.
S-007	To be able to view admin activity in audit trail.
S-008	To be able to completely cancel transaction.

Table 38

Security Test Execution Summary

Test Execution	**Expected Result**	**Actual Result**	
		Cycle 1	**Cycle 2**
No. of Test Cases Executed	100%	100%	100%
Results of Test Cases			
Passed	100%	86%	100%
Failed	0%	14%	0%
No. of Test Cases Not Executed	0%	0%	0%

Evaluation Results

The developed web application was evaluated by IT professionals, Municipal Staffs, and Ordinary Users. A total of 30 respondents from this group evaluated the system according to ISO/IEC 25010 in terms of functional suitability and security, resulting in a weighted average grade of 3.89. The overall weighted mean rating is considered “Very Acceptable” since it lies between 3.26 and 4.0 on the scale.

Table 39

Functional Suitability Evaluation Result

Criteria	**Weighted Mean**	**Descriptive Rating**
Functional completeness	3.93	Very Acceptable
Functional correctness	3.90	Very Acceptable
Functional appropriateness	4.00	Very Acceptable
Overall Weighted Mean	**3.94**	**Very Acceptable**

Table 39 shows that the functional completeness of the system obtained a weighted mean of 3.93 with an equivalent descriptive rating of “Very Acceptable”. This signifies that all the specified tasks and user objectives that were described were covered by the developed web application.

In terms of functional correctness, the developed web application yielded a rating of 3.90 with an equivalent descriptive rating of “Very Acceptable”. This means that the system consistently delivers accurate results with precision. This is evident when data supplied by the users of the application are altered, showcasing the system’s proficiency handling data.

In terms of functional appropriateness, the developed web application obtained a weighted mean of 4.00 with an equivalent descriptive rating of “Very Acceptable”. This indicates that the system can complete the tasks or features required to achieve a specific goal. This can be reflected in the system's notifications feature and alert notice to the users when completing a transaction. The developed web application obtained a 3.94 for the overall weighted mean with an equivalent descriptive rating as "Very Acceptable" for functional suitability.

Table 40

Security Evaluation Result

Criteria	Weighted Mean	Descriptive Rating
Confidentiality	3.77	Very Acceptable
Integrity	3.83	Very Acceptable
Non-repudiation	3.77	Very Acceptable
Accountability	3.90	Very Acceptable
Authenticity	3.87	Very Acceptable
Overall Mean	**3.83**	**Very Acceptable**

In Table 40, it displays the evaluation results for security. In terms of confidentiality, the system obtained a weighted mean of 3.77 with an equivalent descriptive rating as "Very Acceptable". This means that the system ensures that accessing information is accessible to those who have authorization which meets the need for security. This is evident with the system's capability to properly provide access privileges to users.

In terms of integrity, the system obtained a weighted mean of 3.83 with an equivalent descriptive rating as "Very Acceptable". This suggests that users deemed the system as trustworthy and dependable in safeguarding their sensitive data.

In terms of non-repudiation, the system obtained a weighted mean of 3.77 with an equivalent descriptive rating as “Very Acceptable”. This indicates that the system reassures users that the documentation of their information is recorded securely.

In terms of accountability, the system obtained a weighted mean of 3.90 with an equivalent descriptive rating as “Very Acceptable”. This reflects the ability of the system to effectively track and monitor user interactions within the system.

Lastly, in terms of authenticity, the system obtained a weighted mean of 3.87 with an equivalent descriptive rating as “Very Acceptable”. This indicates that the system provides an effective authentication mechanism which verifies the user’s identity when entering the system.

Table 41

Software Evaluation Results Summary

Criteria	Mean	Descriptive Rating
Functional Suitability	3.94	Very Acceptable
Security	3.83	Very Acceptable
Overall Mean	**3.89**	**Very Acceptable**

It is shown in Table 41 the summary of the two evaluation criteria employed to the system. It obtained an overall weighted mean of 3.89 with an equivalent descriptive rating as "Very Acceptable". This indicates that the system met the functional suitability and security requirements in accordance with ISO/IEC 25010.

Chapter 5

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents the summary of findings, conclusions, and the corresponding recommendations based on the results of the system's testing and evaluation.

Summary of Findings

The system was developed to enhance efficiency and centralize the transactions in the Local Government of Manila. Furthermore, it gives users the capability to process their transactions online, which alleviates the need for lengthy queues physically. By analyzing the evaluation results for the acceptability of the web application titled “Development of a Mid-level Centralization Management System for the City of Manila”, the application have greatly assisted users in managing their transactions online and help the admins in managing these user transactions from the platform.

The actual result of the test demonstrates the system’s functional suitability and security. The functional suitability of the system was further defined by its functional correctness, functional completeness, and functional appropriateness where it was evaluated as “Very Acceptable”. This signifies that the system was highly functional because it provided features which satisfied the required outcome when utilized under predetermined conditions and in different scenarios. When it comes to security, the evaluation of the system was “Very Acceptable”, this indicates that the system performed effectively when it comes to securing user data and appropriately authorizing its users’ level and type of access within the system. This criterion is further defined by the confidentiality, integrity, non-repudiation, accountability, and authenticity of the system.

Conclusions

The following are the conclusions derived from the study's findings:

1. The developed "Mid-level Centralization Management for the City of Manila" is successful such that:
    a. Allowed the users to submit application for transactions Real Property Tax Transaction including Tax Payment and Tax Clearance, Business Permit, CTC or Cedula, and Local Civil Registry documents such as Birth Certificate, Marriage Certificate, and Death Certificate.
    b. Allowed the user to manage their transaction history where they utilize PayMongo as payment gateway and downloading Statement of Accounts, and scanning QR code is functional.
    c. Allowed the user to view and edit profile information such as personal, contact, and government information, interacting with AI chatbot responds to user inquiries, application for verification and user settings are functional.
    d. Provided the user with system notification, making it easier for users to monitor the status of the transactions and verification.
    e. A centralized platform for administrators is provided, allowing Registry Admin, RP Tax Admin, Business Permit Admin, CTC or Cedula Admin, Local Civil Registry Admin, and Chief

Admin to process user transactions in their designated module.

f. Provided the Chief Admin an audit trail to track admin activities, permitted it to create new admins within the system, and enabled all admins to view dashboards and generate reports based on the dashboard display.

2. The web application is successfully developed using various development tools such as Visual Studio Code, MySQL Workbench, Express.js, React.js, Node.js, and Git/Github. Additionally, successfully integrated APIs which includes Firebase, PayMongo, IBM Watson Assistant, and Google SMTP.
3. Test results revealed that the system performed well in terms of functional suitability and security.
4. Using ISO/IEC 25010, the developed web application was evaluated as Very Acceptable in terms of functional suitability and security.

Recommendations

To further enhance the capabilities and potentials of the developed system as identified by the conducted survey, the following suggestions are as follows:

1. Include an autofill checkbox when a user fills up personal information in other service transactions to avoid repetition and ease filling out the form.

2. Create a dropdown when uploading a document in the Business Permit requirements to guide the user about what specific documents must be uploaded.

3. Enhance the application for verification list as a table format so the admin can easily view important details of the user.

4. Provide a reason for denial when the Registry Admin rejects an application for verification submitted by the citizens. Also, when a user applied for verification, it should have an expiration in the system.

5. Enable a lock feature in the personal information which prohibits the user from changing it. The way the information could be updated is when the user provided a reason for edit sent to the Registry Administrator.

6. Allow the administrators to generate reports on a monthly period instead of in a year only.

References

Abramitov, S. A., & Dneprovskaya, M. A. (2021). On the issue of digitalization of municipal services in the construction sector. IOP Conference Series: Earth and Environmental Science, 751(1), 012095. https://doi.org/10.1088/1755-1315/751/1/012095

Alyabes, A. F. (2018). Factors affecting consumers' perception of electronic payment in Saudi Arabia. CORE.https://core.ac.uk/display/234628573?utm_source=pdf&utm_medium=banner&utm_campaign=pdf-decoration-v1

Apkarian, A. (2022). How e-Government Can Benefit Your Community. https://www.neoledge.com/us/how-e-government-can-benefit-your-community/

Baghla, A. (2018). A STUDY ON THE FUTURE OF DIGITAL PAYMENTS IN INDIA (e ISSN 2348 –1269,). 5(4), e ISSN 2348 –1269,.

Bent, S.,(2016). The Use Of The Internet By Municipal Governments: Great Expectations. Retrieved from https://library.usask.ca/gic/v3n3/bent/bent.html

Beutler, A., Fabunmi, B., Wiltermood, K., & Talaver, T. (2020). City of San Marcos Payment Processes.

Bianca, A. (2019, February 12). The Disadvantages to Centralized Control in a Business. Small Business - Chron.com. https://smallbusiness.chron.com/disadvantages-centralized-control-business-20670.html

Cederlöv, J., & Hagman, E. (2021). Software quality characteristics and where to find them: A qualitative study of how developers in Örebro work with design quality.

Chang, C & Almaghalsah, H. (2020). Usability evaluation of e-government websites: A case study from Taiwan. International Journal of Data and Network Science, 4(2), 127-138. http://m.growingscience.com/beta/ijds/3749-usability-evaluation-of-e-government-websites-a-case-study-from-taiwan.html

Chatterji, T. (2018). Digital urbanism in a transitional economy–a review of India's municipal e-governance policy. Journal of Asian Public Policy, 11(3), 334-349.

Christudas, B. (2019). MySQL. In: Practical Microservices Architectural Patterns. Apress, Berkeley, CA. https://doi.org/10.1007/978-1-4842-4501-9_27

Dela Cerna, M. A. (2023). Development and implementation of an office automation system for Barangay Local Government units. 2023 4th International Conference for Emerging Technology (INCET). https://doi.org/10.1109/incet57972.2023.10170650

Diegtiar, O. A., Kravchenko, T. A., Yevmieshkina, O. L., Sych, T. V., & Linetska, Y. M. (2021). Innovative foundations for optimizing the information and communication system of local government. Linguistics and Culture Review, 5(S4), 955-967.

E-Governance (2018). ICT for Government. https://ega.ee/wp-content/uploads/2015/02/project_ICT_for_Local_Government.pdf

E-Spin. (2023, February 15). Advantages and Disadvantages of E-Government: Exploring the Pros and Cons of Digital Government Services. Retrieved from https://www.e-spincorp.com/the-advantages-and-disadvantages-of-e-government/

Fisher, J. E. (2023, March 22). Payment systems for local governments. https://www.linkedin.com/pulse/payment-systems-local-governments-jeremy-e-fisher

Ford, J. (2023, March 29). Doing more with less: Utilizing centralization and online payments. LinkedIn. https://www.linkedin.com/pulse/doing-more-less-utilizing-centralization-online-payments-jeremy-ford

GovOS. (2023). The Importance and Purpose of an Effective Government Website. https://govos.com/blog/importance-of-an-effective-government-website/

Granicus (2023). What Is Digital Government Service?. https://granicus.com/dictionary/digital-government-services/

Harris, L. (2020). "Centralizing Transactions: A Case Study of New York City's Success." Public Administration Review, 35(3), 421-435.].

Hlaing, K. M., & Nyaung, D. E. (2019, November 1). Electricity Billing System using Ethereum and Firebase. IEEE Conference Publication | IEEE Xplore. https://ieeexplore.ieee.org/document/8920931

Hossain, R., Sarker, D., Meem, S. S., & Amin, M. (2020). Analysis of Centralized Payment eco-system: A Systematic Review on e-payments. ResearchGate. https://www.researchgate.net/publication/344223983_Analysis_of_Centralized_Payment_Eco-System_A_Systematic_Review_on_E-Payment

Indeed Editorial Team. (2022, July 25). Centralized Management: Definition and Key Features. Indeed. https://www.indeed.com/career-advice/career-development/centralized-management

Jackson, L. (2023) Centralize Workforce Management to Achieve Business Goals. SmartLinx. Retrieved from https://www.smartlinx.com/resources/blog/centralize-workforce-management-better-quality-less-cost

Kalinichenko, L. A., Urzha, O. A., Adamskaya, L. V., Evstratova, T. A., & Medvedeva, N. V. (2021, March 17). Source Municipal Management in Russia: The National Base of the president and system digitalization. Dialnet. https://dialnet.unirioja.es/servlet/articulo?codigo=8108863

Kumar, S. (2023, January 30). Express.js: A Powerful Node.js Framework. Retrieved from https://www.linkedin.com/pulse/expressjs-powerful-nodejs-framework-suneel-kumar

Kumari, R. (2023). Why would the government also provide services online?. https://qr.ae/pKnSrE

Lailiyah, N., & Sebayang, L. K. B. (2020). Effectiveness of E-Billing system in tax payments for taxpayers. Economics Development Analysis Journal, 8(4), 267–280. https://doi.org/10.15294/edaj.v8i4.35266

Liwanag, H.J., Wyss, K. Who should decide for local health services? A mixed methods study of preferences for decision-making in the decentralized Philippine health system. BMC Health Serv Res 20, 305 (2020). https://doi.org/10.1186/s12913-020-05174-w

Mahula, S., Lindquist, M., Norström, L., & Lindman, J. (2022). Digital transformation in local government organisations: Empirical evidence from Blockchain Initiatives. DG.O 2022: The 23rd Annual International Conference on Digital Government Research. https://doi.org/10.1145/3543434.3543474

Malodia, S., Dhir, A., Mishra, M., & Bhatti, Z. A. (2021). Future of e-Government: An integrated conceptual framework. Technological Forecasting and Social Change, 173, 121102.

Manoharan, A. P., & Ingrams, A. (2018). Conceptualizing e-government from local government perspectives. State and Local Government Review, 50(1), 56-66.

MasterClass. (2022, May 10). Centralization Explained: Pros and Cons of Centralization. https://www.masterclass.com/articles/centralization

Melton, P. (2022, March 31). Why integrate a payment gateway into local government customer service? - District. https://www.district.au/article/why-integrate-payment-gateway-local-government-customer-service

Murali, M. (2023, February 08). What Is Visual Studio? HubSpot Blog. https://blog.hubspot.com/website/what-is-visual-studio

Nani, D. A., & Ali, S. (2020). Determinants of effective e-procurement system: Empirical evidence from Indonesian local governments. Jurnal Dinamika Akuntansi dan Bisnis. https://jurnal.usk.ac.id/JDAB/article/view/15671

Nita, A. M., & Goga, C. I. (2018). Strategic Management in the Local Public Administration Institutions. Case study: Application of the Balanced Scorecard instrument in the Zalau City Hall.

Paul, G. S., Agangiba, M., & Mumuni, F. (2021, September 30). Smart Energy Meter with Flexible Billing and Payment Options. Paul | Ghana Journal of Technology. http://www2.umat.edu.gh/gjt/index.php/gjt/article/view/338

Quimba, F. M. A., & Calizo, S. C. (2018). Going Digital: From innovation to inclusive growth in the Philippines. EconStor. https://www.econstor.eu/handle/10419/211039

Ranjitha, H. T., & Chethana, M. (2019). Advanced billing system for government departments. International Journal of Advance Research, Ideas and Innovations in Technology, 5(2).

Ringenson, T., Höjer, M., Kramers, A., & Viggedal, A. (2018, April 21). Digitalization and environmental aims in municipalities. MDPI. https://www.mdpi.com/2071-1050/10/4/1278

Samonte, M. J., Oray, E., & San Juan, K. S. (2023). Exploratory analysis of e-government implementations and blockchain technology on document and identity verification of Overseas Filipino Workers. Proceedings of the 2022 6th International Conference on E-Business and Internet. https://doi.org/10.1145/3572647.3572680

Schmuck, R. (2021). Online Services of Municipal Websites. https://www.researchgate.net/publication/338634052_Online_Services_of_Municipal_Websites

Silva, P., Mota, L. F., Carneiro, R., Valentim, R., & Teles, F. (2023). The Inner Functioning of Local Governance Networks in Centralized Countries: A 'Brave New World'? Social Sciences, 12(5), 289. https://doi.org/10.3390/socsci12050289

Simplilearn. (2023, March 9). Understand The Differences Between React.js and Node.js. https://www.simplilearn.com/tutorials/nodejs-tutorial/reactjs-vs-nodejs

Singhal, R. (2021). IMPACT AND IMPORTANCE OF DIGITAL PAYMENT IN INDIA. INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY EDUCATIONAL RESEARCH, 10(2(3)).

Smith, J. (2017). "Enhancing Efficiency through Transaction Centralization in Local Government." Journal of Public Administration, 23(4), 567-580].

Suryu, J. (2023). 10 Benefits Of The Internet In The Field Of Government. https://sinaumedia.com/10-benefits-of-the-internet-in-the-field-of-government/

The Digital Economy. (2018). Online government services could change your life. But only if you have access to the internet. https://www.weforum.org/agenda/2018/07/government-digital-equal-access-internet-mobile

The Role of Payment Systems in Philippine Tax Administration. (2020). NTRC Tax Research Journal, XXXII.4, 11.

Uster, A., & Cohen, N. (2022). Local government's response to dissatisfaction with centralized policies: the "do-it-yourself" approach. Journal of Cross-Cultural Psychology, 89(3). https://journals.sagepub.com/doi/full/10.1177/00208523221094414

Verkijika, S., & De Wet, L. (2018). A usability assessment of e-government websites in Sub-Saharan africa. International Journal of Information Management, 39, 20–29. https://doi.org/10.1016/j.ijinfomgt.2017.11.003

Vibora, E., P., & Mandigma, Ma. B., S. (2022). Implementation of the Online Tax Payment Facility in a Philippine Local Government Unit. The International Journal of Interdisciplinary Organizational Studies, 17(2).

Whitell, M., Cao, Y., McCabe, B. Y., Shahi, A., De Lint, M., & Shahi, K. (2020, November 9). Standardizing ontario's permitting process for E-permitting Implementation. https://ascelibrary.org/doi/abs/10.1061/9780784482889.143

Yamin, N. Y., Amir, A. M., & Angraini, M. (2018, July). Proceedings of the 5th International Conference on Community Development (AMCA 2018). Retrieved from https://www.atlantis-press.com/proceedings/amca-18/25901800

Yusop, O. M., Mahbub, M. N., Ismail, S. A., Azmi, A., Kama, N., & Sarkan, H. M. (2019). Experiences in Software Development Model Selection and MVC Design Pattern

Implementation for Kuala Lumpur City Hall Traffic Offence Management System. Open International Journal of Informatics, 7(1), 26-34.

Zinca, D., & Negrean, V.-A. (2018, November 1). Development of a Road Tax Payment Application using the Ethereum Platform. IEEE Conference Publication | IEEE Xplore. https://ieeexplore.ieee.org/document/8583975

Appendix A

EVALUATION INSTRUMENT

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**EVALUATION INSTRUMENT FOR
DEVELOPMENT OF A MID-LEVEL CENTRALIZATION MANAGEMENT
SYSTEM FOR THE CITY OF MANILA**

Name (optional): ______________________

Respondent's Category: ☐ IT Professional ☐ Ordinary User
☐ Municipality Staff

Instruction: This evaluation sheet will be used to analyze and improve the presented system. Kindly answer the following questions by placing a check (✓) under the corresponding numerical rating.

Numerical Rating	Equivalent
4	Very Acceptable
3	Acceptable
2	Fairly Acceptable
1	Not Acceptable

CRITERIA	RATING			
	4	**3**	**2**	**1**
A. Functional Suitability				
1. ***Functional Completeness.*** The system meets all the set of specific functions covers all the task and user objection.				
2. ***Functional Correctness.*** The system provides features aligned with the user expectation and provides the correct result with the needed degree of precision.				
3. ***Functional Appropriateness.*** The system facilitates the accomplishment of the specified tasks and objectives.				
B. Performance Efficiency				
1. ***Time Behavior.*** The system response and process user inputs swiftly when performing its function.				
2. ***Resource Utilization.*** The system meets the requirement on utilization of the only required amount and type of resources.				
3. ***Capacity.*** The system performs well on peak load conditions.				
C. Compatibility				
1. ***Co-Existence.*** The system functions correctly and meets its requirement while running with other applications.				
2. ***Interoperability.*** The system interacts and integrates seamlessly with other relevant software.				
D. Usability				
1. ***Appropriateness.*** The system is appropriate to the needs of the users.				

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2. ***Learnability.*** The system can be easy to learn and still use the system with effectiveness, efficiency, freedom from risk, and satisfaction in a specified context of use.				
3. ***Operability.*** The system provides generic input fields, buttons, tabs and other tools so that the user can easily use the system.				
4. ***User Interface Protection.*** The system has specific labels and prompt messages to protect the user from making errors on using the system.				
5. ***User Interface Aesthetics.*** The system has a pleasing and satisfying user interface and it is friendly to use.				
6. ***Accessibility.*** The system can be accessed easily on its intended place.				
E. Maintainability				
1. ***Modularity.*** The system's set of features will not be affected by a change to one component.				
2. ***Reusability.*** The system can still be used by different organizations and companies without affecting one another.				
3. ***Testability.*** The system can be tested easily according to criteria.				
4. ***Analyzability.*** The system can be analyzed quickly and fixed.				
F. Security				
1. ***Confidentiality.*** The system's data is only accessed by the authorized organization and not all information is available to the public consumption, and only authorized higher personnel can access the data.				
2. ***Integrity.*** The system cannot be easily accessed by an unauthorized user.				
3. ***Non-Repudiation.*** The system records all the processes that have been done within the system.				
4. ***Accountability.*** The system can trace the actions and person and prove to be the one claimed.				
5. ***Authenticity.*** The system records and validates all the entities' identification and changes that will be made within the system.				
G. Portability				
1. ***Adaptability.*** The system can be easily deployed on different platforms.				
2. ***Installability.*** The system has the feature to install the user side module as Web Application.				
3. ***Replaceability.*** The system can replace old and other manual processes and software that has the same use.				
H. Reliability				
1. ***Maturity.*** The system meets needs for reliability under normal operation.				
2. ***Availability.*** The system is operational and accessible when required for use.				

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3. ***Fault Tolerance.*** The system operates as intended despite the presence of hardware or software faults.				
4. ***Recoverability.*** In the event of an interruption or failure, the system can recover the data directly affected and re-establish the desired state of the system.				

Recommendations:

____
____
____
____

Appendix B

SAMPLE ANSWERED EVALUATION SHEET

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EVALUATION INSTRUMENT FOR
DEVELOPMENT OF A MID-LEVEL CENTRALIZATION MANAGEMENT SYSTEM FOR THE CITY OF MANILA

Name (optional): SIDNY LIBRADO

Respondent's Category:
- ☐ IT Professional
- ☐ Ordinary User
- ☑ Municipality Staff

Instruction: This evaluation sheet will be used to analyze and improve the presented system. Kindly answer the following questions by placing a check (✓) under the corresponding numerical rating.

Numerical Rating	Equivalent
4	Very Acceptable
3	Acceptable
2	Fairly Acceptable
1	Not Acceptable

CRITERIA	RATING			
	4	3	2	1
A. Functional Suitability				
1. ***Functional Completeness.*** The system meets all the set of specific functions covers all the task and user objection.		✓		
2. ***Functional Correctness.*** The system provides features aligned with the user expectation and provides the correct result with the needed degree of precision.	✓			
3. ***Functional Appropriateness.*** The system facilitates the accomplishment of the specified tasks and objectives.	✓			
B. Performance Efficiency				
1. ***Time Behavior.*** The system response and process user inputs swiftly when performing its function.	✓			
2. ***Resource Utilization.*** The system meets the requirement on utilization of the only required amount and type of resources.	✓			
3. ***Capacity.*** The system performs well on peak load conditions.	✓			
C. Compatibility				
1. ***Co-Existence.*** The system functions correctly and meets its requirement while running with other applications.	✓			
2. ***Interoperability.*** The system interacts and integrates seamlessly with other relevant software.	✓			
D. Usability				
1. ***Appropriateness.*** The system is appropriate to the needs of the users.	✓			

TECHNOLOGICAL UNIVERSITY OF THE PHILIPPINES
College of Science
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2. ***Learnability.*** The system can be easy to learn and still use the system with effectiveness, efficiency, freedom from risk, and satisfaction in a specified context of use.	✓			
3. ***Operability.*** The system provides generic input fields, buttons, tabs and other tools so that the user can easily use the system.	✓			
4. ***User Interface Protection.*** The system has specific labels and prompt messages to protect the user from making errors on using the system.	✓			
5. ***User Interface Aesthetics.*** The system has a pleasing and satisfying user interface and it is friendly to use.	✓			
6. ***Accessibility.*** The system can be accessed easily on its intended place.	✓			
E. Maintainability				
1. ***Modularity.*** The system's set of features will not be affected by a change to one component.	✓			
2. ***Reusability.*** The system can still be used by different organizations and companies without affecting one another.		✓		
3. ***Testability.*** The system can be tested easily according to criteria.	✓			
4. ***Analyzability.*** The system can be analyzed quickly and fixed.	✓			
F. Security				
1. ***Confidentiality.*** The system's data is only accessed by the authorized organization and not all information is available to the public consumption, and only authorized higher personnel can access the data.	✓			
2. ***Integrity.*** The system cannot be easily accessed by an unauthorized user.	✓			
3. ***Non-Reputation.*** The system records all the processes that have been done within the system.	✓			
4. ***Accountability.*** The system can trace the actions and person and prove to be the one claimed.	✓			
5. ***Authenticity.*** The system records and validates all the entities' identification and changes that will be made within the system.	✓			
G. Portability				
1. ***Adaptability.*** The system can be easily deployed on different platforms.	✓			
2. ***Installability.*** The system has the feature to install the user side module as Web Application.	✓			
3. ***Replaceability.*** The system can replace old and other manual processes and software that has the same use.		✓		
H. Reliability				
1. ***Maturity.*** The system meets needs for reliability under normal operation.	✓			
2. ***Availability.*** The system is operational and accessible when required for use.	✓			

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3. ***Fault Tolerance.*** The system operates as intended despite the presence of hardware or software faults.		✓		
4. ***Recoverability.*** In the event of an interruption or failure, the system can recover the data directly affected and re-establish the desired state of the system.	✓			

Recommendations:

Appendix C

SUMMARY OF RESPONDENTS' EVALUATION

Respondent	Functional Suitability			Security				
	Functional Completeness	Functional Correctness	Functional Appropriateness	Confidentiality	Integrity	Non-repudiation	Accountability	Authenticity
1	4	4	4	4	4	4	4	4
2	4	4	4	4	4	4	4	4
3	4	4	4	4	4	4	4	4
4	3	4	4	4	4	4	4	4
5	4	4	4	4	4	4	4	4
6	4	4	4	4	4	4	4	3
7	4	4	4	3	4	4	3	4
8	4	4	4	3	4	4	4	4
9	4	4	4	3	4	3	4	3
10	4	4	4	4	4	3	4	3
11	4	4	4	4	4	4	4	4
12	4	3	4	4	4	3	4	4
13	4	4	4	4	4	3	4	4
14	4	4	4	4	4	4	4	4
15	4	4	4	4	4	4	4	4
16	4	4	4	4	4	4	4	4
17	4	4	4	4	4	4	4	4
18	4	4	4	3	4	4	4	4
19	4	3	4	3	3	4	4	4
20	4	4	4	4	3	4	3	4
21	4	4	4	4	4	4	4	4
22	4	4	4	4	4	4	4	4
23	4	4	4	4	3	3	4	4
24	4	4	4	4	4	4	4	4
25	4	4	4	4	4	4	4	4
26	4	4	4	4	4	4	4	4
27	4	4	4	3	3	3	3	4
28	4	4	4	3	4	4	4	4
29	3	3	4	4	3	3	4	3
30	4	4	4	4	4	4	4	4
Weighted Mean	3.93	3.9	4	3.77	3.83	3.77	3.9	3.87

Appendix D

TEST CASES FOR FUNCTIONAL SUITABILITY

Test Case ID		F-001		UC Reference	Unregistered User
Objective		Register with new mobile number			
Assumptions/Preconditions					
Actions		Expected Result		Actual Result	
1. Click 'register here' on the landing page 2. Fill out the form and put new mobile number 3. Click "Register"		1. User must be redirected to the homepage and an email must be sent to the user		1. User was redirected to the homepage and an email was sent to the user.	
Status	PASSED	Severity		Priority	

Test Case ID		F-002		UC Reference	Unregistered User
Objective		Register with existing mobile number			
Assumptions/Preconditions		An account with existing mobile number is stored in the system			
Actions		Expected Result		Actual Result	
1. Click 'register here' on the landing page 2. Fill out the form with existing mobile number 3. Click "Register"		1. A validation error message should be shown accordingly and positioned correctly in the interface		1. A validation error message was shown accordingly and positioned correctly in the interface	
Status	PASSED	Severity		Priority	

Test Case ID		F-003		UC Reference	Unregistered User
Objective		Register an account			
Assumptions/Preconditions		Not all fields are filled by the user			
Actions		Expected Result		Actual Result	
1. Click "Register"		1. A validation error message requiring the user to fill out all the fields must be displayed		1. A validation error message requiring the user to fill out all the fields was displayed	
Status	PASSED	Severity		Priority	

Test Case ID		F-004		UC Reference	Unregistered User
Objective		Register with invalid password condition			
Assumptions/Preconditions					
Actions		Expected Result		Actual Result	
1. Click 'register here' on the landing page 2. Fill out the form with password that doesn't fit the condition 3. Click "Register"		1. A validation error message should be shown accordingly and positioned correctly in the interface		1. A validation error message was shown accordingly and positioned correctly in the interface	
Status	PASSED	Severity		Priority	

Test Case ID		F-005		**UC Reference**	Unregistered User
Objective		Be able to submit valid ID while registering an account			
Assumptions/Preconditions					
Actions		**Expected Result**		**Actual Result**	
1. Click 'register here' on the landing page 2. Fill out the form and check the box with "yes" label 3. Click the upload valid id and attach the valid id, then click "apply for verification". 4. Click "Register"		1. User must be redirected to the homepage and an email must be sent to the user		1. User was redirected to the homepage and an email was sent to the user	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-006		**UC Reference**	Unverified User, Verified User, All Admin
Objective		Be able to login with valid user credentials			
Assumptions/Preconditions		User has an existing account in the system			
Actions		**Expected Result**		**Actual Result**	
1. On the landing page, enter valid credentials 2. Click login		1. User must be redirected to the home page		1. User was redirected to the home page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-007		**UC Reference**	Unverified User, Verified User, All Admin
Objective		Login with invalid user credentials			
Assumptions/Preconditions		User has an existing account in the system			
Actions		**Expected Result**		**Actual Result**	
3. On the landing page, enter invalid credentials 4. Click login		2. A validation error message must be shown accordingly and positioned correctly in the interface		2. A validation error message was shown accordingly and positioned correctly in the interface	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-008		**UC Reference**	Unregistered User
Objective		Be able to login with Google account			
Assumptions/Preconditions		User is first time signing in using Google account			
Actions		**Expected Result**		**Actual Result**	
1. On the landing page, click "Continue with Google" 2. Provide Google account credentials		1. User must be redirected to register form where user can fill up his/her information		1. User was redirected to register form where user can fill up his/her information	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-009		**UC Reference**	Unverified User, Verified User
Objective		Be able to login with Google account			
Assumptions/Preconditions		The user has previously logged in using their Google account			
Actions		**Expected Result**		**Actual Result**	
1. On the landing page, click "Continue with Google" 2. Provide Google account credentials		1. User must be redirected to the homepage		1. User was redirected to the register form	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-010		**UC Reference**	Unregistered User
Objective		Be able to login with Facebook account			
Assumptions/Preconditions		User is first time singing in using Facebook account			
Actions		**Expected Result**		**Actual Result**	
1. 1. On the landing page, click "Continue with Facebook" 2. Provide Facebook account credentials		1. User must be redirected to register form where user can fill up his/her information		1. User was redirected to register form,	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-011		**UC Reference**	Unverified User, Verified User
Objective		Be able to login with Facebook account			
Assumptions/Preconditions		The user has previously logged in using their Facebook account			
Actions		**Expected Result**		**Actual Result**	
1. On the landing page, click "Continue with Facebook" 2. Provide Facebook account credentials		1. User must be redirected to the home page		1. User was redirected to the home page.	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-012		**UC Reference**	Unverified User, Verified User
Objective		Be able to reset password using mobile number linked to the account			
Assumptions/Preconditions		Account already exists			
Actions		**Expected Result**		**Actual Result**	
1. Click "forgot password?" 2. Enter the mobile number linked to the account3 3. Type the correct OTP sent by the system. 4. Provide new password, then click submit		1. OTP must be sent to the user after providing correct mobile number 2. User must be able to submit password reset and must be redirected to login page		1. OTP was sent to the user after providing correct mobile number 2. User was able to submit password reset and was redirected to login page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-013		**UC Reference**	Unverified User, Verified User
Objective		Be able to login after resetting password			
Assumptions/Preconditions		Password reset is successful			
Actions		**Expected Result**		**Actual Result**	
1. Enter login credentials including new password 2. Verify login using sent OTP		1. User must be redirected to the home page		1. User was redirected to the home page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-014		**UC Reference**	Unverified User, Verified User
Objective		Be reset password using mobile number not linked to the account			
Assumptions/Preconditions		Account already exists			
Actions		**Expected Result**		**Actual Result**	
1. Click "forgot password?" 2. Enter a mobile number not linked to the account		1. A validation error message must be shown accordingly and positioned correctly in the interface		1. A validation error message must be shown accordingly and positioned correctly in the interface	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-015		**UC Reference**	Verified User
Objective		Be able to pay using Gcash			
Assumptions/Preconditions		The user have a Gcash account with available funds			
Actions		**Expected Result**		**Actual Result**	
1. Select Gcash as the payment method during the payment process. 2. Enter Gcash account credentials. 3. Confirm the payment.		1. User must be redirected to a page stating that the payment is successful 2. User should receive an email containing the receipt of the payment 3. The transaction status must be updated to "paid" in the users' transaction history		1. User was redirected to a page stating that the payment is successful. 2. User have received an email containing the receipt of the payment. 3. The transaction status was updated to "paid" in the users' transaction history.	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-016		**UC Reference**	Verified User
Objective		Be able to pay using GrabPay			
Assumptions/Preconditions		The user have a GrabPay account with available funds			
Actions		**Expected Result**		**Actual Result**	
1. Select GrabPay as the payment method during the payment process. 2. Enter GrabPay account credentials. 3. Confirm the payment.		1. User must be redirected to a page stating that the payment is successful. 2. User should receive an email containing the receipt of the payment. 3. The transaction status must be updated to "paid" in the users' transaction history.		1. User was redirected to a pag stating that the payment is successful. 2. User have received an email containing the receipt of the payment. 3. The transaction status was updated to "paid" in the users' transaction history.	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-017		UC Reference	Verified User
Objective		Be able to pay using Maya			
Assumptions/Preconditions		The user have a Maya account with available funds			
Actions		Expected Result		Actual Result	
1. Select Maya as the payment method during the payment process. 2. Enter Maya account credentials. 3. Confirm the payment.		1. User must be redirected to a page stating that the payment is successful. 2. User should receive an email containing the receipt of the payment. 3. The transaction status must be updated to "paid" in the users' transaction history.		1. User was redirected to a page stating that the payment is successful. 2. User have received an email containing the receipt of the payment. 3. The transaction status was updated to "paid" in the users' transaction history.	
Status	PASSED	Severity		Priority	

Test Case ID		F-018		UC Reference	Verified User
Objective		Be able to pay using BillEase			
Assumptions/Preconditions		The user have a BillEase account with available funds			
Actions		Expected Result		Actual Result	
1. Select BillEase as the payment method during the payment process. 2. Enter BillEase account credentials. 3. Confirm the payment.		1. User must be redirected to a page stating that the payment is successful. 2. User should receive an email containing the receipt of the payment. 3. The transaction status must be updated to "paid" in the users' transaction history.		1. User was redirected to a page stating that the payment is successful. 2. User have received an email containing the receipt of the payment. 3. The transaction status was updated to "paid" in the users' transaction history.	
Status	PASSED	Severity		Priority	

Test Case ID		F-019		UC Reference	Verified User
Objective		Be able to download SOA			
Assumptions/Preconditions		User has transactions with status as pending in Transactions History			
Actions		Expected Result		Actual Result	
1. Navigate to the "Transaction History" section. 2. Locate and click on the Download SOA button		1. The Statement of Account must be downloaded in PDF format and the documents downloaded are the ones with pending status reflected in the page.		1. The Statement of Account was downloaded in PDF format and the documents downloaded are the ones with pending status reflected in the page.	
Status	PASSED	Severity		Priority	

Test Case ID		F-020		UC Reference	Verified User
Objective		Be able to download SOA while using filter			
Assumptions/Preconditions		User has past transactions in Transactions History			
Actions		Expected Result		Actual Result	
1. Navigate to the "Transaction History" section. 2. Filter the data by transaction status as pending 3. Click on the Download SOA button.		1. The Statement of Account should be downloaded in PDF format and the documents downloaded are the ones with pending status reflected in the page after using the filter.		1. The Statement of Account should be downloaded in PDF format and the documents downloaded are the ones with pending status reflected in the page after using the filter.	
Status	PASSED	Severity		Priority	

Test Case ID		F-021		**UC Reference**	Verified User
Objective		Download SOA while using filter			
Assumptions/Preconditions		User has past transactions in Transactions History			
Actions		**Expected Result**		**Actual Result**	
1. Navigate to the "Transaction History" section. 2. Filter the data by range of date, transaction ID, type of transaction, and transaction status is not pending. 3. click on the Download SOA button.		1. Download SOA button must be disabled.		1. Download SOA button was disabled	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-022		**UC Reference**	Verified User
Objective		Be able to manage terms & conditions			
Assumptions/Preconditions		User clicked on any type of document request in the sidebar			
Actions		**Expected Result**		**Actual Result**	
1. In the sidebar, click any module like Real Property Tax (Tax Payment/Tax Clearance), Business Permit, CTC/Cedula, or Local Civil Registry (Birth Certificate/Marriage Certificate/Death Certificate). 2. Click the checkbox agreeing to the Terms & Conditions 3. Click "Proceed"		1. User must be able to see the terms & condition prompt before creating a transaction 2. The terms & conditions prompt must blur the background 3. The "proceed" button must be disabled when the checkbox is left uncheck 4. The user must be redirected to the form after clicking proceed		1. User was able to see the terms & condition prompt before creating a transaction 2. The terms & conditions prompt was able to blur the background 3. The "proceed" button was disabled when the checkbox is left uncheck 4. The user was redirected to the form after clicking proceed	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-023		**UC Reference**	Verified User
Objective		Be able to cancel terms & conditions			
Assumptions/Preconditions		User clicked on any type of document request in the sidebar			
Actions		**Expected Result**		**Actual Result**	
1. In the sidebar, click any module like Real Property Tax (Tax Payment/Tax Clearance), Business Permit, CTC/Cedula, or Local Civil Registry (Birth Certificate/Marriage Certificate/Death Certificate). 2. Click "Cancel" in the Terms & Conditions prompt		1. User must be able to see the terms & condition prompt before creating a transaction 2. The terms & conditions prompt must blur the background 3. User must be redirected to the home page		1. User was able to see the terms & condition prompt before creating a transaction 2. The terms & conditions prompt was able to blur the background 3. User was redirected to the home page	
Status	PASSED	**Severity**		**Priority**	

<table>
<tr><th colspan="2">Test Case ID</th><td colspan="2">F-024</td><th>UC Reference</th><td>Verified User</td></tr>
<tr><th colspan="2">Objective</th><td colspan="4">Be able to submit request for Real Property Tax Payment</td></tr>
<tr><th colspan="2">Assumptions/Preconditions</th><td colspan="4">User is on the tax payment page, agreed to the terms and conditions, and has field out all the required fields</td></tr>
<tr><th colspan="2">Actions</th><th colspan="2">Expected Result</th><th colspan="2">Actual Result</th></tr>
<tr><td colspan="2">1. Fill out all the required fields in the form with correct information. Then, click Proceed.
2. Click submit after reviewing the entered information</td><td colspan="2">1. A pop-up modal must correctly display all user-entered information for review.
2. User must be redirected to transaction history where the recent transaction is displayed and must be labeled as processing
3. Email and system notification must be sent to the user.</td><td colspan="2">1. A pop-up modal was able to correctly display all user-entered information for review.
2. User was redirected to transaction history where the recent transaction is displayed and was labeled as processing.
3. Email and system notification was sent to the user.</td></tr>
<tr><th>Status</th><td>PASSED</td><th>Severity</th><td></td><th>Priority</th><td></td></tr>
</table>

<table>
<tr><th colspan="2">Test Case ID</th><td colspan="2">F-025</td><th>UC Reference</th><td>Verified User</td></tr>
<tr><th colspan="2">Objective</th><td colspan="4">Be able to submit request for Real Property Tax Payment</td></tr>
<tr><th colspan="2">Assumptions/Preconditions</th><td colspan="4">User is on the tax payment page and has not field out all the required fields</td></tr>
<tr><th colspan="2">Actions</th><th colspan="2">Expected Result</th><th colspan="2">Actual Result</th></tr>
<tr><td colspan="2">1. Leave some of the required fields empty in the form with correct information.Then, click proceed.</td><td colspan="2">1. A validation error message must be shown accordingly and positioned correctly in the interface</td><td colspan="2">1. A validation error message was shown accordingly and positioned correctly in the interface</td></tr>
<tr><th>Status</th><td>PASSED</td><th>Severity</th><td></td><th>Priority</th><td></td></tr>
</table>

<table>
<tr><th colspan="2">Test Case ID</th><td colspan="2">F-026</td><th>UC Reference</th><td>Verified User</td></tr>
<tr><th colspan="2">Objective</th><td colspan="4">Be able to submit request for Real Property Tax Clearance</td></tr>
<tr><th colspan="2">Assumptions/Preconditions</th><td colspan="4">User is on the tax clearance page and has not field out all the required fields</td></tr>
<tr><th colspan="2">Actions</th><th colspan="2">Expected Result</th><th colspan="2">Actual Result</th></tr>
<tr><td colspan="2">1. Fill out all the required fields in the form with correct information. Then, click Proceed.
2. Click submit after reviewing the entered information</td><td colspan="2">1. A pop-up modal must correctly display all user-entered information for review.
2. User must be redirected to transaction history where the recent transaction is displayed and must be labeled as pending
3. Email and system notification must be sent to the user.</td><td colspan="2">1. A pop-up modal was able to correctly display all user-entered information for review.
2. User was redirected to transaction history where the recent transaction is displayed and was labeled as pending.
3. Email and system notification was sent to the user.</td></tr>
<tr><th>Status</th><td>PASSED</td><th>Severity</th><td></td><th>Priority</th><td></td></tr>
</table>

Test Case ID		F-027		UC Reference	Verified User
Objective		Be able to submit request for Real Property Tax Clearance			
Assumptions/Preconditions		User is on the tax clearance page and has not field out all the required fields			
Actions		Expected Result		Actual Result	
1. Leave some of the required fields empty in the form with correct information.Then, click proceed.		1. A validation error message must be shown accordingly and positioned correctly in the interface		1. A validation error message was shown accordingly and positioned correctly in the interface	
Status	PASSED	Severity		Priority	

Test Case ID		F-028		UC Reference	Verified User
Objective		Be able to submit request for Business Permit			
Assumptions/Preconditions		User is on the business permit page and has field out all the required fields			
Actions		Expected Result		Actual Result	
1. Fill out all the required fields in the form with correct information. Then, click Proceed. 2. Click submit after reviewing the entered information		1. A pop-up modal must correctly display all user-entered information for review. 2. User must be redirected to transaction history where the recent transaction is displayed and must be labeled as processing 3. Email and system notification must be sent to the user.		1. A pop-up modal was able to correctly display all user-entered information for review. 2. User must be redirected to transaction history where the recent transaction is displayed and was labeled as processing 3. Email and system notification was sent to the user.	
Status	PASSED	Severity		Priority	

Test Case ID		F-029		UC Reference	Verified User
Objective		Be able to submit request for Business Permit			
Assumptions/Preconditions		User is on the business permit page, agreed to the terms and conditions, and has not field out all the required fields			
Actions		Expected Result		Actual Result	
1. Leave some of the required fields empty in the form with correct information.Then, click proceed.		1. A validation error message must be shown accordingly and positioned correctly in the interface.		1. A validation error message was shown accordingly and positioned correctly in the interface	
Status	PASSED	Severity		Priority	

Test Case ID		F-030		UC Reference	Verified User
Objective		Be able to upload documents in business requirements			
Assumptions/Preconditions		User is on the business permit page and agreed to the terms and conditions			
Actions		Expected Result		Actual Result	
1. Find the business requirements section then click any upload button. 2. Upload a document by dragging and dropping a file or click the box to upload. Then, click upload.		1. File window should be displayed and must let the user attach a file and upload it.		1. File window was displayed and allowed the user to attach a file and upload it.	
Status	PASSED	Severity		Priority	

Test Case ID		F-031		UC Reference	Verified User
Objective		Be able to remove documents in business requirements			
Assumptions/Preconditions		User is on the business permit page and agreed to the terms and conditions			
Actions		Expected Result		Actual Result	
1. Find the business requirements section then click any upload button. 2. Upload a document by dragging and dropping a file or click the box to upload. Then, click upload. 3. Click remove button		1. Remove button must appear after uploading an attachment 2. Uploaded document must be removed .		1. Remove button must appear after uploading an attachment 2. Uploaded document must be removed .	
Status	PASSED	Severity		Priority	

Test Case ID		F-032		UC Reference	Verified User
Objective		Be able to upload a document in tax incentive			
Assumptions/Preconditions		User is on the business permit page and agreed to the terms and conditions			
Actions		Expected Result		Actual Result	
1. Find the tax incentive section then click the yes radio button. 2. Click Upload. Upload a document by dragging and dropping a file or click the box to upload. Then, click upload.		1. File window should be displayed and must let the user attach a file and upload it.		1. File window was displayed and allowed the user to attach a file and upload it.	
Status	PASSED	Severity		Priority	

Test Case ID		F-033		UC Reference	Verified User
Objective		Be able to remove a document in tax incentives			
Assumptions/Preconditions		User is on the business permit page and agreed to the terms and conditions			
Actions		Expected Result		Actual Result	
1. Find the tax incentive section then click any upload button. 2. Upload a document by dragging and dropping a file or click the box to upload. Then, click upload. 3. Click remove button		1. Remove button must appear after uploading an attachment 2. Uploaded document must be removed .		1. Remove button must appear after uploading an attachment 2. Uploaded document must be removed .	
Status	PASSED	Severity		Priority	

Test Case ID		F-034		UC Reference	Verified User
Objective		Be able to add information in the business activity table			
Assumptions/Preconditions		User is on the business permit page, agreed to the terms and conditions, and filled out the required fields in the business activity section			
Actions		Expected Result		Actual Result	
1. Fill out the necessary details and click the Add button.		1. A row must be added to the table reflecting the information filled out by the user.		1. A row was added to the table reflecting the information filled out by the user.	
Status	PASSED	Severity		Priority	

Test Case ID		F-035		**UC Reference**	Verified User
Objective		Be able to add information in the business activity table			
Assumptions/Preconditions		User is on the business permit page, agreed to the terms and conditions, and left blank the required fields in the business activity section			
Actions		**Expected Result**		**Actual Result**	
2. Leave empty the required fields and click the Add button.		1. A validation error message must be shown accordingly and positioned correctly in the interface.		1. A validation error message was shown accordingly and positioned correctly in the interface.	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-036		**UC Reference**	Verified User
Objective		Be able to update information in the business activity table			
Assumptions/Preconditions		User is on the business permit page, agreed to the terms and conditions, and already has an existing entry in the table			
Actions		**Expected Result**		**Actual Result**	
1. Click the edit icon 3. Change some details then click the check symbol		2. User must have updated the entry in the table		2. User have updated the entry in the table	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-037		**UC Reference**	Verified User
Objective		Be able to delete information in the business activity table			
Assumptions/Preconditions		User is on the business permit page, agreed to the terms and conditions, and already has an existing entry in the table			
Actions		**Expected Result**		**Actual Result**	
1. Click the trash icon.		1. User must have deleted the entry in the table.			
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-038		**UC Reference**	Verified User
Objective		Be able to submit request for CTC/Cedula			
Assumptions/Preconditions		User is on the CTC/Cedula page, agreed to the terms and conditions, and has field out all the required fields			
Actions		**Expected Result**		**Actual Result**	
1. Fill out all the required fields in the form with correct information. Then, click Proceed. 2. Click submit after reviewing the entered information		1. A pop-up modal must correctly display all user-entered information for review. 2. User must be redirected to transaction history where the recent transaction is displayed and must be labeled as pending		1. A pop-up modal was able to correctly display all user-entered information for review. 2. User must be redirected to transaction history where the recent transaction is displayed and was labeled as pending	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-039		**UC Reference**	Verified User
Objective		Be able to submit request for CTC/Cedula			
Assumptions/Preconditions		User is on the CTC/Cedula page, agreed to the terms and conditions, and has not field out all the required fields			
Actions		**Expected Result**		**Actual Result**	
1. Leave some of the required fields empty in the form with correct information.Then, click proceed.		1. A validation error message should be shown accordingly and positioned correctly in the interface		1. A validation error message was shown accordingly and positioned correctly in the interface	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-040		**UC Reference**	Verified User
Objective		Be able to submit request for Birth Certificate			
Assumptions/Preconditions		User is on the Birth Certificate page, agreed to the terms and conditions, and has field out all the required fields			
Actions		**Expected Result**		**Actual Result**	
1. Fill out all the required fields in the form with correct information. Then, click Proceed. 2. Click submit after reviewing the entered information		1. A pop-up modal must correctly display all user-entered information for review. 2. User must be redirected to transaction history where the recent transaction is displayed and must be labeled as pending		1. A pop-up modal was able to correctly display all user-entered information for review. 2. User must be redirected to transaction history where the recent transaction is displayed and must be labeled as pending	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-041		**UC Reference**	Verified User
Objective		Be able to submit request for Birth Certificate			
Assumptions/Preconditions		User is on the Birth Certificate page, agreed to the terms and conditions, and has not field out all the required fields			
Actions		**Expected Result**		**Actual Result**	
1. Leave some of the required fields empty in the form with correct information.Then, click proceed.		1. A validation error message must be shown accordingly and positioned correctly in the interface		1. A validation error message was shown accordingly and positioned correctly in the interface	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-042		**UC Reference**	Verified User
Objective		Be able to submit request for Marriage Certificate			
Assumptions/Preconditions		User is on the Marriage Certificate page, agreed to the terms and conditions, and has field out all the required fields			
Actions		**Expected Result**		**Actual Result**	
1. Fill out all the required fields in the form with correct information. Then, click Proceed. 2. Click submit after reviewing the entered information		1. A pop-up modal must correctly display all user-entered information for review. 2. User must be redirected to transaction history where the recent transaction is displayed and must be labeled as pending		1. A pop-up modal was able to correctly display all user-entered information for review. 2. User was redirected to transaction history where the recent transaction is displayed and was labeled as pending	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-043		UC Reference	Verified User
Objective		Be able to submit request for Marriage Certificate			
Assumptions/Preconditions		User is on the Marriage Certificate page, agreed to the terms and conditions, and has not field out all the required fields			
Actions		Expected Result		Actual Result	
1. Leave some of the required fields empty in the form with correct information.Then, click proceed.		1. A validation error message must be shown accordingly and positioned correctly in the interface		1. A validation error message was shown accordingly and positioned correctly in the interface	
Status	PASSED	Severity		Priority	

Test Case ID		F-044		UC Reference	Verified User
Objective		Be able to submit request for Death Certificate			
Assumptions/Preconditions		User is on the Death Certificate page, agreed to the terms and conditions, and has field out all the required fields			
Actions		Expected Result		Actual Result	
1. Fill out all the required fields in the form with correct information. Then, click Proceed. 2. Click submit after reviewing the entered information		1. A pop-up modal must correctly display all user-entered information for review. 2. User must be redirected to transaction history where the recent transaction is displayed and must be labeled as pending		1. A pop-up modal was able to correctly display all user-entered information for review. 2. User was redirected to transaction history where the recent transaction is displayed and was labeled as pending	
Status	PASSED	Severity		Priority	

Test Case ID		F-045		UC Reference	Verified User
Objective		Be able to submit request for Death Certificate			
Assumptions/Preconditions		User is on the Death Certificate page, agreed to the terms and conditions, and has not field out all the required fields			
Actions		Expected Result		Actual Result	
1. Leave some of the required fields empty in the form with correct information.Then, click proceed.		1. A validation error message must be shown accordingly and positioned correctly in the interface		1. A validation error message was shown accordingly and positioned correctly in the interface	
Status	PASSED	Severity		Priority	

Test Case ID		F-046		UC Reference	Unverified User, Verified User
Objective		Be able to view notifications			
Assumptions/Preconditions		Click the notifications icon			
Actions		Expected Result		Actual Result	
1. Click the notifications icon.		1. Notifications of user must be displayed		1. Notifications of were displayed	
Status	PASSED	Severity		Priority	

Test Case ID		F-047		UC Reference	Unverified User, Verified User
Objective		Be able to mark read all notifications			
Assumptions/Preconditions		User has unread notifications			
Actions		Expected Result		Actual Result	
1. Click the notifications icon 2. Click the "Mark all notifications as read"		1. All unread notifications must be mark as read		1. All unread notifications were mark as read	
Status	PASSED	Severity		Priority	

Test Case ID		F-048		UC Reference	Unverified User, Verified User
Objective		Be able to show unread notifications			
Assumptions/Preconditions		User has unread notifications			
Actions		Expected Result		Actual Result	
1. Click the notifications icon 2. Click the toggle button labeled as "only show unread"		1. All unread notifications must be displayed in the notifications		1. All unread notifications were displayed in the notifications	
Status	PASSED	Severity		Priority	

Test Case ID		F-049		UC Reference	Unverified User, Verified User
Objective		Be able to view and update personal information			
Assumptions/Preconditions		User is on the personal information page			
Actions		Expected Result		Actual Result	
1. Click the edit profile button 2. Fill out the fields, then click save changes.		1. User should have updated his/her personal information		1. User have updated his/her personal information	
Status	PASSED	Severity		Priority	

Test Case ID		F-050		UC Reference	Unverified User, Verified User
Objective		Be able to view and update personal information			
Assumptions/Preconditions		User left out some fields blank			
Actions		Expected Result		Actual Result	
1. Click the edit profile button 2. Fill out the fields while leaving some fields blank, then click save changes.		1. A validation error message must be shown accordingly and positioned correctly in the interface		1. A validation error message was shown accordingly and positioned correctly in the interface	
Status	PASSED	Severity		Priority	

Test Case ID		F-051		UC Reference	Unverified User, Verified User
Objective		Be able to view and update government information			
Assumptions/Preconditions		User is on the government information page			
Actions		Expected Result		Actual Result	
1. Click the edit profile button 2. Fill out the fields, then click save changes.		1. User should have updated his/her government information		1. User have updated his/her government information	
Status	PASSED	Severity		Priority	

Test Case ID		F-052		UC Reference	Unverified User, Verified User
Objective		Be able to view and update government information			
Assumptions/Preconditions		User left out some fields blank			
Actions		Expected Result		Actual Result	
1. Click the edit profile button 2. Fill out the fields while leaving some fields blank, then click save changes.		1. A validation error message must be shown accordingly and positioned correctly in the interface		1. A validation error message was shown accordingly and positioned correctly in the interface	
Status	PASSED	Severity		Priority	

Test Case ID		F-053		UC Reference	Unverified User, Verified User
Objective		Be able to view and update contact information			
Assumptions/Preconditions		User is on the contact information page			
Actions		Expected Result		Actual Result	
1. Click the edit profile button 2. Fill out the fields, then click save changes.		1. User should have updated his/her contact information		1. User should have updated his/her contact information	
Status	PASSED	Severity		Priority	

Test Case ID		F-054		UC Reference	Unverified User, Verified User
Objective		Be able to view and update contact information			
Assumptions/Preconditions		User left out some fields blank			
Actions		Expected Result		Actual Result	
1. Click the edit profile button 2. Fill out the fields while leaving some fields blank, then click save changes.		1. A validation error message must be shown accordingly and positioned correctly in the interface		1. A validation error message must be shown accordingly and positioned correctly in the interface	
Status	PASSED	Severity		Priority	

Test Case ID	F-055	**UC Reference**	Unverified User, Verified User
Objective	Be able to interact with AI chatbot		
Assumptions/Preconditions	User is logged in		
Actions	**Expected Result**	**Actual Result**	
1. Click the pop up with the label as virtual assistant	1. AI Chatbot must respond to the users prompt/questions	1. AI Chatbot was able to respond to the users prompt/questions	
Status PASSED	**Severity**	**Priority**	

Test Case ID	F-056	**UC Reference**	Unverified User, Verified User
Objective	Be able view past transactions		
Assumptions/Preconditions	User has past transactions		
Actions	**Expected Result**	**Actual Result**	
1. Click the transaction history on the sidebar.	1. User must be redirected to the Transactions history page where his/her past transactions is displayed	1. User was redirected to the Transactions history page where his/her past transactions were displayed	
Status PASSED	**Severity**	**Priority**	

Test Case ID	F-057	**UC Reference**	Unverified User, Verified User
Objective	Be able view details of past transaction		
Assumptions/Preconditions	User has past transactions		
Actions	**Expected Result**	**Actual Result**	
1. Click the transactions history on the sidebar 2. Click view details button	1. User must be redirected to a pop up displaying the transaction details of a specific transaction	1. User was redirected to a pop up displaying the transaction details of a specific transaction	
Status PASSED	**Severity**	**Priority**	

Test Case ID	F-058	**UC Reference**	Unverified User, Verified User
Objective	Be able to cancel transaction		
Assumptions/Preconditions	User is on the transactions history page and past transaction is labeled as pending		
Actions	**Expected Result**	**Actual Result**	
1. Click view details button 2. Click the cancel transaction button 3. In the confirmation pop up, click cancel transaction	1. User must be redirected back to transaction history and the status of the transaction was changed from pending to canceled.	1. User was redirected back to transaction history and the status of the transaction was changed from pending to canceled.	
Status PASSED	**Severity**	**Priority**	

Test Case ID		F-059		**UC Reference**	Unverified User, Verified User
Objective		Be able to pay transaction			
Assumptions/Preconditions		User is on the transactions history page and past transaction is labeled as pending			
Actions		**Expected Result**		**Actual Result**	
1. Click view details button 2. Click the pay transaction button		1. User must be redirected to Paymongo page		1. User was redirected to Paymongo page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-060		**UC Reference**	Unverified User, Verified User
Objective		Be able to filter transactions			
Assumptions/Preconditions		User is on the transactions history page and has past transactions			
Actions		**Expected Result**		**Actual Result**	
1. Click the filter button 2. Filter the transactions by range of date, transaction id, transaction type, and status of transaction		1. User transactions must be displayed according to the filter.		1. User transactions were displayed according to the filter	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-061		**UC Reference**	Unverified User, Verified User
Objective		Be able to clear filter			
Assumptions/Preconditions		User filtered the transactions			
Actions		**Expected Result**		**Actual Result**	
1. Click the clear button.		1. The default view of the transactions must be displayed to the user 2. The fields in the filter button should be cleared		1. The default view of the transactions were displayed to the user 2. The fields in the filter button were cleared	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-062		**UC Reference**	Unverified User, Verified User
Objective		Be able to scan QR code			
Assumptions/Preconditions		User has past transaction in transaction history			
Actions		**Expected Result**		**Actual Result**	
1. Click view details of a specific transaction 2. Scan the QR Code using mobile phone		1. File must be downloaded containing the details of the transaction.		1. File was downloaded containing the details of the transaction.	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-063		UC Reference	Unverified User, Verified User
Objective		Be able to view contacts page			
Assumptions/Preconditions		The user is logged in their account			
Actions		Expected Result		Actual Result	
1. Click contact on the footer.		1. User must be able to view contacts		1. User was able to view contacts	
Status	PASSED	Severity		Priority	

Test Case ID		F-064		UC Reference	Unverified User, Verified User
Objective		Be able to navigate map			
Assumptions/Preconditions		The user is logged in their account and on the contacts page			
Actions		Expected Result		Actual Result	
1. Click and move the maps 2. Press 'Ctrl' on keyboard and scroll the mouse		1. User must be able to move the map 2. User must be able to zoom in and zoom out the map		1. User was able to move the map 2. User was able to zoom in and zoom out the map	
Status	PASSED	Severity		Priority	

Test Case ID		F-065		UC Reference	Unverified User, Verified User
Objective		Be able to view privacy policy page			
Assumptions/Preconditions		The user is logged in their account			
Actions		Expected Result		Actual Result	
1. Click the 'Privacy Policy' button at the footer.		1. User must be able to view the privacy policy page		1. User was able to view the privacy policy page	
Status	PASSED	Severity		Priority	

Test Case ID		F-066		UC Reference	Unverified User, Verified User
Objective		Be able to view settings page			
Assumptions/Preconditions		The user is logged in their account			
Actions		Expected Result		Actual Result	
1. Click the user's profile picture at the upper right 2. Click the 'Settings" button		1. User must be redirected to the settings page		1. User was redirected to the settings page	
Status	PASSED	Severity		Priority	

Test Case ID		F-067		UC Reference	Unverified User, Verified User
Objective		Be able to change profile photo			
Assumptions/Preconditions		The user is at the settings page			
Actions		Expected Result		Actual Result	
1. Click 'upload profile photo' button 2. Click 'choose file' button 3. Select a 'PNG', 'JPEG' or 'JPG' image 4. Press the 'open' button 5. Press 'save changes' button		1. New profile image should be saved and displayed. 2. 'Upload Image Successful' message should appear. 3. Profile icon must change to new uploaded image.		1. New profile image is saved and displayed. 2. 'Upload Image Successful' message appeared. 3. Profile icon was changed to the newly uploaded image.	
Status	PASSED	Severity		Priority	

Test Case ID		F-068		UC Reference	Unverified User, Verified User
Objective		Be able to change the password			
Assumptions/Preconditions		The user is at the settings page			
Actions		Expected Result		Actual Result	
1. Enter current password at the 'current password' textbox 2. Enter new password at the 'new password' textbox 3. Enter new password at the 'confirm new password' textbox 4. Press 'change password' button		1. User must be able to change the old password.		1. Password was successfully changed,	
Status	PASSED	Severity		Priority	

Test Case ID		F-069		UC Reference	Unverified User
Objective		Be able to apply for account verification			
Assumptions/Preconditions		The user is at the settings page			
Actions		Expected Result		Actual Result	
1. Click apply for account verification button 2. Upload a valid ID 3. Click apply for verification button		1. User must be able to send a verification request 2. File window should be displayed and must let the user attach a file and upload it. 3. A successful message must be displayed and an email must be sent to the user		1. User was able to send a verification request 2. File window was displayed and allowed the user to attach a file and upload it. 3. A successful message was displayed an email was sent to the user	
Status	PASSED	Severity		Priority	

Test Case ID		F-070		UC Reference	Unverified User, Verified User
Objective		Be able to delete account			
Assumptions/Preconditions		The user is at the settings page			
Actions		Expected Result		Actual Result	
1. Click the delete account button. 2. Click Ok		1. User must be redirected to the landing page. 2. User account must be deleted.		1. User was redirected to the landing page. 2. User account is deleted.	
Status	PASSED	Severity		Priority	

Test Case ID		F-071		UC Reference	Unverified User, Verified User, All Admin
Objective		Be able to logout account			
Assumptions/Preconditions		The user is logged in their account			
Actions		Expected Result		Actual Result	
1. Click logout.		1. User must be redirected to the landing page 2. User must be logged out the session		1. User must be redirected to the landing page 2. User must be logged out the session	
Status	PASSED	Severity		Priority	

Test Case ID		F-072		UC Reference	Unverified User, Verified User, All Admin
Objective		Be able to remove profile photo			
Assumptions/Preconditions		The user is logged in their account			
Actions		Expected Result		Actual Result	
1. Click remove profile photo.		1. Display must be reloaded showing a default profile photo		1. Display reloaded and default profile photo was displayed.	
Status	PASSED	Severity		Priority	

Test Case ID		F-073		UC Reference	Unverified User
Objective		Access service request as unverified user			
Assumptions/Preconditions		The user is logged in their account			
Actions		Expected Result		Actual Result	
1. In the sidebar, click any module like Real Property Tax (Tax Payment/Tax Clearance), Business Permit, CTC/Cedula, or Local Civil Registry (Birth Certificate/Marriage Certificate/Death Certificate).		1. User access must be denied. 2. A pop-up must show obliging the user to verify the account.		1. User access was denied. 2. A pop-up was shown obliging the user to verify the account.	
Status	PASSED	Severity		Priority	

Test Case ID		F-074		UC Reference	Unverified User
Objective		Be able to verify account			
Assumptions/Preconditions		The user has clicked to any service request on the sidebar			
Actions		Expected Result		Actual Result	
1. Click Verify Now		1. User access must be redirected to the settings.		1. User access was redirected to the settings	
Status	PASSED	Severity		Priority	

Test Case ID		F-075		**UC Reference**	Chief Admin, Real Property Tax Admin, Business Permit Admin, CTC/Cedula Admin, Local Civil Registry Admin
Objective		Be able to view the dashboard			
Assumptions/Preconditions		Admin is logged in the system			
Actions		**Expected Result**		**Actual Result**	
1. Click the 'Dashboard' button at the sidebar		1. Must view the dashboard page		1. Viewed the dashboard page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-076		**UC Reference**	Chief Admin, Real Property Tax Admin, Business Permit Admin, CTC/Cedula Admin, Local Civil Registry Admin
Objective		Download the Generated Reports in Dashboard			
Assumptions/Preconditions		There are data about the transactions in the dashboard and Admin is at the Dashboard page			
Actions		**Expected Result**		**Actual Result**	
1. Click the 'generate reports' button in the Admin Dashboard		1. Admin will get the file containing information about the transactions processed in the system		1. Admin got the file containing information about the transactions processed in the system.	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-077		**UC Reference**	Chief Admin, Real Property Tax Admin, Business Permit Admin, CTC/Cedula Admin, Local Civil Registry Admin
Objective		Download the Generated Reports in Dashboard with specific year in the dropdown			
Assumptions/Preconditions		There are data about the transactions in the dashboard			
Actions		**Expected Result**		**Actual Result**	
1. Select a specific year on the dropdown button on top of the generate reports button 2. Click the 'generate reports' button in the Admin Dashboard		1. Admin will get the file containing information on a specific year about the transactions processed in the system.		1. Admin got the file containing information on a specific year about the transactions processed in the system.	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-078		**UC Reference**	Real Property Tax Admin, Business Permit Admin, CTC/Cedula Admin, Local Civil Registry Admin
Objective		Change the perspective type of transactions into card mode			
Assumptions/Preconditions		The view type is in table mode			
Actions		**Expected Result**		**Actual Result**	
1. Click the button with three column icon		1. The transactions will be in card mode displaying more details		1. The transactions is in card mode displaying more details	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-079		**UC Reference**	Real Property Tax Admin, Business Permit Admin, CTC/Cedula Admin, Local Civil Registry Admin
Objective		Change the perspective type of transactions into table mode			
Assumptions/Preconditions		The view type is in card mode			
Actions		**Expected Result**		**Actual Result**	
1. Click the button with the table icon		1. The transactions will be in table mode allowing user to see more transactions at the same time		1. The transactions is in table mode allowing user to see more transactions at the same time	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-080		**UC Reference**	Real Property Tax Admin
Objective		View the Real Property Tax Charges page			
Assumptions/Preconditions		Admin is logged in the system			
Actions		**Expected Result**		**Actual Result**	
1. Click the 'Real Property Tax' dropdown button at the sidebar 2. Click the 'Tax Charges' button		1. Must view the real property tax charges page		1. Viewed the real property tax charges page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-081		**UC Reference**	Real Property Tax Admin
Objective		Transfer a Real Property Tax Charges transaction into the awaiting payments			
Assumptions/Preconditions		There are existing transaction in the real property tax charges			
Actions		**Expected Result**		**Actual Result**	
1. Choose a transaction in the table and click the check/process button 2. Type the amount 3. Click the 'confirm' button on the modal that appeared		1. The transaction in the tax charges page will transfer into the awaiting payments page 2. A modal will appear with the information and input field after clicking the check/process button 3. The transaction will transfer from tax charges to awaiting payments		1. The transaction in the tax charges page transferred into the awaiting payments page 2. A modal appeared with the information and input field after clicking the check/process button 3. The transaction transferred from tax charges to awaiting payments	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-082		**UC Reference**	Real Property Tax Admin
Objective		Canceling the transfer of a transaction in the real property tax charges after clicking the process button			
Assumptions/Preconditions		There are existing transaction request in the real property tax charges			
Actions		**Expected Result**		**Actual Result**	
1. Choose a transaction in the table and click the check/process button 2. Input amount 3. Click the 'cancel' button on the modal that appeared		1. The transaction will not be transferred into the awaiting payments and will still be at the tax charges page		1. The transaction in the tax charges page is not transferred into the awaiting payments and is still at the tax charges page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-083		**UC Reference**	Real Property Tax Admin
Objective		View the Real Property Tax awaiting payments page			
Assumptions/Preconditions		Admin is logged in the system			
Actions		**Expected Result**		**Actual Result**	
1. Click the 'Real Property Tax' dropdown button at the sidebar 2. Click the 'awaiting payments' button		1. Must to view the real property tax awaiting payments page		1. Viewed the real property tax awaiting payments page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-084		**UC Reference**	Real Property Tax Admin
Objective		View the Real Property Tax Processing Section page			
Assumptions/Preconditions		Admin is logged in the system			
Actions		**Expected Result**		**Actual Result**	
1. Click the 'Real Property Tax' dropdown button at the sidebar 2. Click the 'Processing Section' button		1. Must view the real property tax processing section page		1. Viewed the real property tax processing section page	
Status	PASSED	**Severity**		**Priority**	

<table>
<tr><td>Test Case ID</td><td colspan="2">F-085</td><td>UC Reference</td><td colspan="2">Real Property Tax Admin</td></tr>
<tr><td>Objective</td><td colspan="5">Complete a real property tax processing transaction at the processing section</td></tr>
<tr><td>Assumptions/Preconditions</td><td colspan="5">There are existing processing transaction in the real property tax processing section</td></tr>
<tr><td colspan="2">Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td colspan="2">1. Choose a processing transaction in the table and click the check/complete button
2. Click the ‘confirm’ button on the modal that appeared</td><td colspan="2">1. The processing transaction at the processing section webpage will complete the transaction removing it from the webpage and changing the status of the transaction into ‘complete’
2. A modal will appear after clicking the check/complete button
3. The processing transaction made by the user in their transaction history will have a ‘complete’ status</td><td colspan="2">1. The processing transaction at the processing section webpage will complete the transaction removing it from the webpage and changing the status of the transaction into ‘complete’
2. A modal appeared after clicking the check/complete button with a message to confirm the action with ‘cancel’ and ‘confirm’ button
3. The processing transaction made by the user in their transaction history became a ‘complete’ status</td></tr>
<tr><td>Status</td><td>PASSED</td><td>Severity</td><td></td><td>Priority</td><td></td></tr>
</table>

<table>
<tr><td>Test Case ID</td><td colspan="2">F-086</td><td>UC Reference</td><td colspan="2">Real Property Tax Admin</td></tr>
<tr><td>Objective</td><td colspan="5">Canceling the completion of a processing transaction in the real property tax after clicking the process button</td></tr>
<tr><td>Assumptions/Preconditions</td><td colspan="5">There are existing processing transaction in the real property tax processing section</td></tr>
<tr><td colspan="2">Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td colspan="2">1. Choose a processing transaction in the table and click the check/complete button
2. Click the ‘cancel’ button on the modal that appeared</td><td colspan="2">1. The processing transaction will not be completed and will still be at the processing section page</td><td colspan="2">1. The processing transaction is not completed and is still at the processing section page</td></tr>
<tr><td>Status</td><td>PASSED</td><td>Severity</td><td></td><td>Priority</td><td></td></tr>
</table>

<table>
<tr><td>Test Case ID</td><td colspan="2">F-087</td><td>UC Reference</td><td colspan="2">Real Property Tax Admin</td></tr>
<tr><td>Objective</td><td colspan="5">Be able to use the filter in the Tax Charges, Awaiting Payments, Processing Section, and Archives of Real Property Tax</td></tr>
<tr><td>Assumptions/Preconditions</td><td colspan="5">There are existing transactions in the real property tax awaiting payments, processing section, and tax charges and the user is either at the Tax Charges Awaiting Payments, and Processing Section of Real Property Tax</td></tr>
<tr><td colspan="2">Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td colspan="2">1. Click ‘filter’ button
2. Fill the filter by date, type, transaction id, TDN, and PIN
3. Click ‘filter’ button at the popover</td><td colspan="2">1. User transactions must be displayed according to the filter</td><td colspan="2">1. User transactions were displayed according to the filter</td></tr>
<tr><td>Status</td><td>PASSED</td><td>Severity</td><td></td><td>Priority</td><td></td></tr>
</table>

<table>
<tr><td colspan="2">Test Case ID</td><td colspan="2">F-088</td><td>UC Reference</td><td>Real Property Tax Admin</td></tr>
<tr><td colspan="2">Objective</td><td colspan="4">Remove all the information entered/selected at the filter popover at real property tax charges, awaiting payments, processing section, or archives</td></tr>
<tr><td colspan="2">Assumptions/Preconditions</td><td colspan="4">There are information entered/selected at the filter popover</td></tr>
<tr><td colspan="2">Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td colspan="2">1. Click 'clear' button</td><td colspan="2">1. The previous information entered/selected at the filter popover should be cleared</td><td colspan="2">1. The previous information entered/selected at the filter popover are cleared</td></tr>
<tr><td>Status</td><td>PASSED</td><td>Severity</td><td></td><td>Priority</td><td></td></tr>
</table>

<table>
<tr><td colspan="2">Test Case ID</td><td colspan="2">F-089</td><td>UC Reference</td><td>Real Property Tax Admin</td></tr>
<tr><td colspan="2">Objective</td><td colspan="4">Be able to view more details of a transaction in the Awaiting Payments, Processing Section, Tax Charges, and Archives of Real Property Tax</td></tr>
<tr><td colspan="2">Assumptions/Preconditions</td><td colspan="4">There are existing transactions in the real property tax awaiting payments, processing section, and tax charges and the user is either at the Awaiting Payments, Processing Section, and Tax Charges of Real Property Tax</td></tr>
<tr><td colspan="2">Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td colspan="2">1. Click the body of a specific transaction</td><td colspan="2">1. A modal will appear containing the details of a specific transaction</td><td colspan="2">1. A modal appeared containing the details of a specific transaction</td></tr>
<tr><td>Status</td><td>PASSED</td><td>Severity</td><td></td><td>Priority</td><td></td></tr>
</table>

<table>
<tr><td colspan="2">Test Case ID</td><td colspan="2">F-090</td><td>UC Reference</td><td>Business Permit Admin</td></tr>
<tr><td colspan="2">Objective</td><td colspan="4">View the Business Permit Charges page</td></tr>
<tr><td colspan="2">Assumptions/Preconditions</td><td colspan="4">Admin is logged in the system</td></tr>
<tr><td colspan="2">Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td colspan="2">1. Click the 'Business Permit' dropdown button at the sidebar
2. Click the 'Permit Charges' button</td><td colspan="2">1. Must to view the business permit charges page</td><td colspan="2">1. Viewed the business permit charges page</td></tr>
<tr><td>Status</td><td>PASSED</td><td>Severity</td><td></td><td>Priority</td><td></td></tr>
</table>

<table>
<tr><td colspan="2">Test Case ID</td><td colspan="2">F-091</td><td>UC Reference</td><td>Business Permit Admin</td></tr>
<tr><td colspan="2">Objective</td><td colspan="4">Transfer a Business Permit Charges transaction into the awaiting payments</td></tr>
<tr><td colspan="2">Assumptions/Preconditions</td><td colspan="4">There are existing transaction in the business permit charges</td></tr>
<tr><td colspan="2">Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td colspan="2">1. Choose a transaction in the table and click the check/process button
2. Fill the required fields
3. Click the 'confirm' button on the modal that appeared</td><td colspan="2">1. The transaction in the business permit tax page will transfer into the awaiting payments page
2. A modal will appear with the information and input field after clicking the check/process button
3. The transaction will transfer from permit charges to awaiting payments</td><td colspan="2">1. The transaction in the permit charges page transferred into the awaiting payments page
2. A modal appeared with the information and input field after clicking the check/process button
3. The transaction transferred from tax charges to awaiting payments</td></tr>
<tr><td>Status</td><td>PASSED</td><td>Severity</td><td></td><td>Priority</td><td></td></tr>
</table>

<table>
<tr><td>Test Case ID</td><td colspan="2">F-092</td><td>UC Reference</td><td>Business Permit Admin</td></tr>
<tr><td>Objective</td><td colspan="4">Canceling the transfer of a transaction in the business permit charges after clicking the process button</td></tr>
<tr><td>Assumptions/Preconditions</td><td colspan="4">There are existing transaction request in the business permit charges</td></tr>
<tr><td>Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td>1. Choose a transaction in the table and click the check/process button
2. Fill the required fields
3. Click the ‘cancel’ button on the modal that appeared</td><td colspan="2">1. The transaction will not be transferred into the awaiting payments and will still be at the business permit charges page</td><td colspan="2">1. The transaction in the permit charges page is not transferred into the awaiting payments and is still at the business permit charges page</td></tr>
<tr><td>Status</td><td>PASSED</td><td>Severity</td><td></td><td>Priority</td></tr>
</table>

<table>
<tr><td>Test Case ID</td><td colspan="2">F-093</td><td>UC Reference</td><td>Business Permit Admin</td></tr>
<tr><td>Objective</td><td colspan="4">View the Business Permit Awaiting Payments page</td></tr>
<tr><td>Assumptions/Preconditions</td><td colspan="4">Admin is logged in the system</td></tr>
<tr><td>Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td>1. Click the ‘Business Permit’ dropdown button at the sidebar
2. Click the ‘Awaiting Payments’ button</td><td colspan="2">1. Must view the business permit awaiting payments page</td><td colspan="2">1. Viewed the business permit awaiting payments page</td></tr>
<tr><td>Status</td><td>PASSED</td><td>Severity</td><td></td><td>Priority</td></tr>
</table>

<table>
<tr><td>Test Case ID</td><td colspan="2">F-094</td><td>UC Reference</td><td>Business Permit Admin</td></tr>
<tr><td>Objective</td><td colspan="4">View the Business Permit Processing Section page</td></tr>
<tr><td>Assumptions/Preconditions</td><td colspan="4">Admin is logged in the system</td></tr>
<tr><td>Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td>1. Click the ‘Business Permit’ dropdown button at the sidebar
2. Click the ‘Processing Section’ button</td><td colspan="2">1. Must view the business permit processing section page</td><td colspan="2">1. Viewed the business permit processing section page</td></tr>
<tr><td>Status</td><td>PASSED</td><td>Severity</td><td></td><td>Priority</td></tr>
</table>

<table>
<tr><td>Test Case ID</td><td colspan="2">F-095</td><td>UC Reference</td><td>Business Permit Admin</td></tr>
<tr><td>Objective</td><td colspan="4">Complete a business permit processing transaction at the processing section</td></tr>
<tr><td>Assumptions/Preconditions</td><td colspan="4">There are existing processing transaction in the business permit processing section</td></tr>
<tr><td>Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td>3. Choose a processing transaction in the table and click the check/complete button
4. Click the ‘confirm’ button on the modal that appeared</td><td colspan="2">4. The processing transaction at the processing section webpage will complete the transaction removing it from the webpage and changing the status of the transaction into ‘complete’
5. A modal will appear after clicking the check/complete button
6. The processing transaction made by the user in their transaction history will have a ‘complete’ status</td><td colspan="2">4. The processing transaction at the processing section webpage will complete the transaction removing it from the webpage and changing the status of the transaction into ‘complete’
5. A modal appeared after clicking the check/complete button with a message to confirm the action with ‘cancel’ and ‘confirm’ button
6. The processing transaction made by the user in their transaction history became a ‘complete’ status</td></tr>
<tr><td>Status</td><td>PASSED</td><td>Severity</td><td></td><td>Priority</td></tr>
</table>

<table>
<tr><td>Test Case ID</td><td colspan="2">F-088</td><td>UC Reference</td><td>Real Property Tax Admin</td></tr>
<tr><td>Objective</td><td colspan="4">Remove all the information entered/selected at the filter popover at real property tax charges, awaiting payments, or processing section</td></tr>
<tr><td>Assumptions/Preconditions</td><td colspan="4">There are information entered/selected at the filter popover</td></tr>
<tr><td>Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td>1. Click 'clear' button</td><td colspan="2">1. The previous information entered/selected at the filter popover should be cleared</td><td colspan="2">1. The previous information entered/selected at the filter popover are cleared</td></tr>
<tr><td>Status PASSED</td><td>Severity</td><td></td><td>Priority</td><td></td></tr>
</table>

<table>
<tr><td>Test Case ID</td><td colspan="2">F-089</td><td>UC Reference</td><td>Real Property Tax Admin</td></tr>
<tr><td>Objective</td><td colspan="4">Be able to view more details of a transaction in the Awaiting Payments, Processing Section, and Tax Charges of Real Property Tax</td></tr>
<tr><td>Assumptions/Preconditions</td><td colspan="4">There are existing transactions in the real property tax awaiting payments, processing section, and tax charges and the user is either at the Awaiting Payments, Processing Section, and Tax Charges of Real Property Tax</td></tr>
<tr><td>Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td>1. Click the body of a specific transaction</td><td colspan="2">1. A modal will appear containing the details of a specific transaction</td><td colspan="2">1. A modal appeared containing the details of a specific transaction</td></tr>
<tr><td>Status PASSED</td><td>Severity</td><td></td><td>Priority</td><td></td></tr>
</table>

<table>
<tr><td>Test Case ID</td><td colspan="2">F-090</td><td>UC Reference</td><td>Business Permit Admin</td></tr>
<tr><td>Objective</td><td colspan="4">View the Business Permit Charges page</td></tr>
<tr><td>Assumptions/Preconditions</td><td colspan="4">Admin is logged in the system</td></tr>
<tr><td>Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td>1. Click the 'Business Permit' dropdown button at the sidebar
2. Click the 'Permit Charges' button</td><td colspan="2">1. Must to view the business permit charges page</td><td colspan="2">1. Viewed the business permit charges page</td></tr>
<tr><td>Status PASSED</td><td>Severity</td><td></td><td>Priority</td><td></td></tr>
</table>

<table>
<tr><td>Test Case ID</td><td colspan="2">F-091</td><td>UC Reference</td><td>Business Permit Admin</td></tr>
<tr><td>Objective</td><td colspan="4">Transfer a Business Permit Charges transaction into the awaiting payments</td></tr>
<tr><td>Assumptions/Preconditions</td><td colspan="4">There are existing transaction in the business permit charges</td></tr>
<tr><td>Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td>1. Choose a transaction in the table and click the check/process button
2. Fill the required fields
3. Click the 'confirm' button on the modal that appeared</td><td colspan="2">1. The transaction in the business permit tax page will transfer into the awaiting payments page
2. A modal will appear with the information and input field after clicking the check/process button
3. The transaction will transfer from permit charges to awaiting payments</td><td colspan="2">1. The transaction in the permit charges page transferred into the awaiting payments page
2. A modal appeared with the information and input field after clicking the check/process button
3. The transaction transferred from tax charges to awaiting payments</td></tr>
<tr><td>Status PASSED</td><td>Severity</td><td></td><td>Priority</td><td></td></tr>
</table>

Test Case ID		F-092		UC Reference	Business Permit Admin
Objective		Canceling the transfer of a transaction in the business permit charges after clicking the process button			
Assumptions/Preconditions		There are existing transaction request in the business permit charges			
Actions		Expected Result		Actual Result	
1. Choose a transaction in the table and click the check/process button 2. Fill the required fields 3. Click the 'cancel' button on the modal that appeared		1. The transaction will not be transferred into the awaiting payments and will still be at the business permit charges page		1. The transaction in the permit charges page is not transferred into the awaiting payments and is still at the business permit charges page	
Status	PASSED	Severity		Priority	

Test Case ID		F-093		UC Reference	Business Permit Admin
Objective		View the Business Permit Awaiting Payments page			
Assumptions/Preconditions		Admin is logged in the system			
Actions		Expected Result		Actual Result	
1. Click the 'Business Permit' dropdown button at the sidebar 2. Click the 'Awaiting Payments' button		1. Must view the business permit awaiting payments page		1. Viewed the business permit awaiting payments page	
Status	PASSED	Severity		Priority	

Test Case ID		F-094		UC Reference	Business Permit Admin
Objective		View the Business Permit Processing Section page			
Assumptions/Preconditions		Admin is logged in the system			
Actions		Expected Result		Actual Result	
1. Click the 'Business Permit' dropdown button at the sidebar		1. Must view the business permit processing section page		1. Viewed the business permit processing section page	

Test Case ID		F-095		UC Reference	Business Permit Admin
Objective		Complete a business permit processing transaction at the processing section			
Assumptions/Preconditions		There are existing processing transaction in the business permit processing section			
Actions		Expected Result		Actual Result	
3. Choose a processing transaction in the table and click the check/complete button 4. Click the 'confirm' button on the modal that appeared		4. The processing transaction at the processing section webpage will complete the transaction removing it from the webpage and changing the status of the transaction into 'complete' 5. A modal will appear after clicking the check/complete button 6. The processing transaction made by the user in their transaction history will have a 'complete' status		4. The processing transaction at the processing section webpage will complete the transaction removing it from the webpage and changing the status of the transaction into 'complete' 5. A modal appeared after clicking the check/complete button with a message to confirm the action with 'cancel' and 'confirm' button 6. The processing transaction made by the user in their transaction history became a 'complete' status	
Status	PASSED	Severity		Priority	

Test Case ID		F-096		**UC Reference**	Business Permit Admin
Objective		Canceling the completion of a processing transaction in the real property tax after clicking the process button			
Assumptions/Preconditions		There are existing processing transaction in the real property tax processing section			
Actions		**Expected Result**		**Actual Result**	
3. Choose a processing transaction in the table and click the check/complete button 4. Click the 'cancel' button on the modal that appeared		2. The processing transaction will not be completed and will still be at the processing section page		2. The processing transaction is not completed and is still at the processing section page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-097		**UC Reference**	Business Permit Admin
Objective		Be able to use the filter in the Tax Charges, Awaiting Payments, and Processing Section of Real Property Tax			
Assumptions/Preconditions		There are existing transactions in the real property tax awaiting payments, processing section, and tax charges and the user is either at the Tax Charges Awaiting Payments, and Processing Section of Real Property Tax			
Actions		**Expected Result**		**Actual Result**	
4. Click 'filter' button 5. Fill the filter button by date, type, transaction id, TDN, and PIN 6. Click 'filter' button at the popover		2. User transactions must be displayed according to the filter		2. User transactions were displayed according to the filter	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-098		**UC Reference**	Business Permit Admin
Objective		Remove all the information entered/selected at the filter popover at business permit charges, transaction requests, or processing section			
Assumptions/Preconditions		There are information entered/selected at the filter popover			
Actions		**Expected Result**		**Actual Result**	
2. Click 'clear' button		2. The previous information entered/selected at the filter popover should be cleared		2. The previous information entered/selected at the filter popover are cleared	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-099		**UC Reference**	Business Permit Admin
Objective		Be able to view more details of a transaction in the Awaiting Payments, Processing Section, and Permit Charges of Business Permit			
Assumptions/Preconditions		There are existing transactions in the business permit awaiting payments, processing section, and permit charges and the user is either at the Awaiting Payments, Processing Section, and Permit Charges of Business Permit			
Actions		**Expected Result**		**Actual Result**	
2. Click the body of a specific transaction		2. A modal will appear containing the details of a specific transaction		2. A modal appeared containing the details of a specific transaction	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-100		**UC Reference**	CTC/Cedula Admin
Objective		View the CTC/Cedula Transaction Requests page			
Assumptions/Preconditions		Admin is logged in the system			
Actions		**Expected Result**		**Actual Result**	
1. Click the 'CTC/Cedula' dropdown button at the sidebar 2. Click the 'Transaction Requests' button		1. Must view the CTC/Cedula transaction requests page		1. Viewed the CTC/Cedula transaction requests page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-101		**UC Reference**	CTC/Cedula Admin
Objective		Transfer a pending CTC/Cedula transaction request into the processing section			
Assumptions/Preconditions		There are existing transaction request in the CTC/Cedula transaction requests			
Actions		**Expected Result**		**Actual Result**	
1. Choose a transaction request in the table and click the check/process button 2. Click the 'confirm' button on the modal that appeared		1. The processed transaction in the transaction requests page will transfer into the processing section page 2. A modal will appear after clicking the check/process button 3. The transaction request made by the user in their transaction history will have a 'processing' status		1. The processed transaction in the transaction requests page transferred into the processing section page 2. A modal appeared after clicking the check/process button with a message to confirm the action with 'cancel' and 'confirm' button 3. The transaction request made by the user in their transaction history became a 'processing' status	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-102		**UC Reference**	CTC/Cedula Admin
Objective		Canceling the transfer of a transaction request in the CTC/Cedula after clicking the process button			
Assumptions/Preconditions		There are existing transaction request in the CTC/Cedula transaction requests			
Actions		**Expected Result**		**Actual Result**	
1. Choose a transaction request in the table and click the check/process button 2. Click the 'cancel' button on the modal that appeared		1. The transaction request will not be transferred into the processing section and will still be at the transaction request page		1. The transaction request is not transferred into the processing section and is still at the transaction request page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-103		**UC Reference**	CTC/Cedula Admin
Objective		Be able to use the filter in the Transaction Requests, Processing Section, and Archives of CTC/Cedula			
Assumptions/Preconditions		There are existing transaction request in the CTC/Cedula transaction requests			
Actions		**Expected Result**		**Actual Result**	
1. Click 'filter' button 2. fill the filter by date, transaction id, and owner's name 3. Click 'filter' button at the popover		1. User transaction requests must be displayed according to the filter.		1. User transaction requests were displayed according to the filter.	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-104		**UC Reference**	CTC/Cedula Admin
Objective		Remove all the information entered/selected at the filter popover at CTC/Cedula transaction requests, processing section, or archives			
Assumptions/Preconditions		There are information entered/selected at the filter popover			
Actions		**Expected Result**		**Actual Result**	
1. Click ‘clear’ button		1. The previous information entered/selected at the filter popover should be cleared		1. The previous information entered/selected at the filter popover are cleared	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-105		**UC Reference**	CTC/Cedula Admin
Objective		View the CTC/Cedula Processing Section page			
Assumptions/Preconditions		Admin is logged in the system			
Actions		**Expected Result**		**Actual Result**	
1. Click the ‘CTC/Cedula’ dropdown button at the sidebar 2. Click the ‘Processing Section’ button at the sidebar		1. Must view the CTC/Cedula processing section page		1. Viewed the CTC/Cedula processing section page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-106		**UC Reference**	CTC/Cedula Admin
Objective		Complete a CTC/Cedula processing transaction at the processing section			
Assumptions/Preconditions		There are existing processing transaction in the CTC/Cedula processing section			
Actions		**Expected Result**		**Actual Result**	
1. Choose a processing transaction in the table and click the check/complete button 2. Click the ‘confirm’ button on the modal that appeared		1. The processing transaction at the processing section webpage will complete the transaction removing it from the webpage and changing the status of the transaction into ‘complete’ 2. A modal will appear after clicking the check/complete button 3. The processing transaction made by the user in their transaction history will have a ‘complete’ status		1. The processing transaction at the processing section webpage will complete the transaction removing it from the webpage and changing the status of the transaction into ‘complete’ 2. A modal appeared after clicking the check/complete button with a message to confirm the action with ‘cancel’ and ‘confirm’ button 3. The processing transaction made by the user in their transaction history became a ‘complete’ status	
Status	PASSED	**Severity**		**Priority**	

<table>
<tr><td colspan="2">Test Case ID</td><td colspan="2">F-107</td><td>UC Reference</td><td>CTC/Cedula Admin</td></tr>
<tr><td colspan="2">Objective</td><td colspan="4">Canceling the completion of a processing transaction in the CTC/Cedula after clicking the process button</td></tr>
<tr><td colspan="2">Assumptions/Preconditions</td><td colspan="4">There are existing processing transaction in the CTC/Cedula processing section</td></tr>
<tr><td colspan="2">Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td colspan="2">1. Choose a processing transaction in the table and click the check/complete button
2. Click the 'cancel' button on the modal that appeared</td><td colspan="2">1. The processing transaction will not be completed and will still be at the processing section page</td><td colspan="2">1. The processing transaction is not completed and is still at the processing section page</td></tr>
<tr><td>Status</td><td>PASSED</td><td>Severity</td><td></td><td>Priority</td><td></td></tr>
</table>

<table>
<tr><td colspan="2">Test Case ID</td><td colspan="2">F-108</td><td>UC Reference</td><td>CTC/Cedula Admin</td></tr>
<tr><td colspan="2">Objective</td><td colspan="4">Be able to view more details of transaction at the CTC/Cedula transaction requests, processing section, and archives</td></tr>
<tr><td colspan="2">Assumptions/Preconditions</td><td colspan="4">There are existing processing transaction in the CTC/Cedula processing section</td></tr>
<tr><td colspan="2">Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td colspan="2">1. Click the body of a specific processing transaction</td><td colspan="2">1. A modal will appear containing the details of a specific processing transaction</td><td colspan="2">1. A modal appeared containing the details of a specific processing transaction</td></tr>
<tr><td>Status</td><td>PASSED</td><td>Severity</td><td></td><td>Priority</td><td></td></tr>
</table>

<table>
<tr><td colspan="2">Test Case ID</td><td colspan="2">F-109</td><td>UC Reference</td><td>Local Civil Registry Admin</td></tr>
<tr><td colspan="2">Objective</td><td colspan="4">View the Local Civil Registry Transaction Requests page</td></tr>
<tr><td colspan="2">Assumptions/Preconditions</td><td colspan="4">Admin is logged in the system</td></tr>
<tr><td colspan="2">Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td colspan="2">1. Click the 'Local Civil Registry' dropdown button at the sidebar
2. Click the 'Transaction Requests' button</td><td colspan="2">1. Must view the Local Civil Registry transaction requests page</td><td colspan="2">1. Viewed the Local Civil Registry transaction requests page</td></tr>
<tr><td>Status</td><td>PASSED</td><td>Severity</td><td></td><td>Priority</td><td></td></tr>
</table>

<table>
<tr><td colspan="2">Test Case ID</td><td colspan="2">F-110</td><td>UC Reference</td><td>Local Civil Registry Admin</td></tr>
<tr><td colspan="2">Objective</td><td colspan="4">Transfer a pending local civil registry transaction request into the processing section</td></tr>
<tr><td colspan="2">Assumptions/Preconditions</td><td colspan="4">There are existing transaction request in the local civil registry transaction requests</td></tr>
<tr><td colspan="2">Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td colspan="2">1. Choose a transaction request in the table and click the check/process button
2. Click the 'confirm' button on the modal that appeared</td><td colspan="2">1. The processed transaction in the transaction requests page will transfer into the processing section page
2. A modal will appear after clicking the check/process button
3. The transaction request made by the user in their transaction history will have a 'processing' status</td><td colspan="2">1. The processed transaction in the transaction requests page transferred into the processing section page
2. A modal appeared after clicking the check/process button with a message to confirm the action with 'cancel' and 'confirm' button
3. The transaction request made by the user in their transaction history became a 'processing' status</td></tr>
<tr><td>Status</td><td>PASSED</td><td>Severity</td><td></td><td>Priority</td><td></td></tr>
</table>

Test Case ID		F-111		**UC Reference**	Local Civil Registry Admin
Objective		Canceling the transfer of a transaction request in the local civil registry after clicking the process button			
Assumptions/Preconditions		There are existing transaction request in the local civil registry transaction requests			
Actions		**Expected Result**		**Actual Result**	
1. Choose a transaction request in the table and click the check/process button 2. Click the 'cancel' button on the modal that appeared		1. The transaction request will not be transferred into the processing section and will still be at the transaction request page		1. The transaction request is not transferred into the processing section and is still at the transaction request page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-112		**UC Reference**	Local Civil Registry Admin
Objective		Be able to use the filter in the Transaction Requests, Processing Section, and Archives of Local Civil Registry			
Assumptions/Preconditions		There are existing transaction request in the local civil registry transaction requests			
Actions		**Expected Result**		**Actual Result**	
1. Click 'filter' button 2. fill the filter by date, type, transaction id, and client name 3. Click 'filter' button at the popover		1. The displayed data is going to be filtered accurately and will only show the transactions by the filtered date, type, transaction id, and client name		1. The displayed data is filtered accurately and only shown the transactions by the filtered date, type, transaction id, and client name	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-113		**UC Reference**	Local Civil Registry Admin
Objective		View the Local Civil Registry Processing Section page			
Assumptions/Preconditions		Admin is logged in the system			
Actions		**Expected Result**		**Actual Result**	
1. Click the 'Local Civil Registry' dropdown button at the sidebar 2. Click the 'Processing Section' button		1. Must view the Local Civil Registry processing section page		1. Viewed the Local Civil Registry processing section page	
Status	PASSED	**Severity**		**Priority**	

<table>
<tr><td colspan="2">Test Case ID</td><td colspan="2">F-114</td><td>UC Reference</td><td>Local Civil Registry Admin</td></tr>
<tr><td colspan="2">Objective</td><td colspan="4">Complete a local civil registry processing transaction at the processing section</td></tr>
<tr><td colspan="2">Assumptions/Preconditions</td><td colspan="4">There are existing processing transaction in the local civil registry processing section</td></tr>
<tr><td colspan="2">Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td colspan="2">1. Choose a processing transaction in the table and click the check/complete button
2. Click the ‘confirm’ button on the modal that appeared</td><td colspan="2">1. The processing transaction at the processing section webpage will complete the transaction removing it from the webpage and changing the status of the transaction into ‘complete’
2. A modal will appear after clicking the check/complete button
3. The processing transaction made by the user in their transaction history will have a ‘complete’ status</td><td colspan="2">1. The processing transaction at the processing section webpage will complete the transaction removing it from the webpage and changing the status of the transaction into ‘complete’
2. A modal appeared after clicking the check/complete button with a message to confirm the action with ‘cancel’ and ‘confirm’ button
3. The processing transaction made by the user in their transaction history became a ‘complete’ status</td></tr>
<tr><td>Status</td><td>PASSED</td><td>Severity</td><td></td><td>Priority</td><td></td></tr>
</table>

<table>
<tr><td colspan="2">Test Case ID</td><td colspan="2">F-115</td><td>UC Reference</td><td>Local Civil Registry Admin</td></tr>
<tr><td colspan="2">Objective</td><td colspan="4">Remove all the information entered/selected at the filter popover at local civil registry transaction requests, processing section, and archives</td></tr>
<tr><td colspan="2">Assumptions/Preconditions</td><td colspan="4">There are information entered/selected at the filter popover</td></tr>
<tr><td colspan="2">Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td colspan="2">1. Click ‘clear’ button</td><td colspan="2">1. The previous information entered/selected at the filter popover should be cleared</td><td colspan="2">1. The previous information entered/selected at the filter popover are cleared</td></tr>
<tr><td>Status</td><td>PASSED</td><td>Severity</td><td></td><td>Priority</td><td></td></tr>
</table>

<table>
<tr><td colspan="2">Test Case ID</td><td colspan="2">F-116</td><td>UC Reference</td><td>Local Civil Registry Admin</td></tr>
<tr><td colspan="2">Objective</td><td colspan="4">Canceling the completion of a processing transaction in the local civil registry after clicking the process button</td></tr>
<tr><td colspan="2">Assumptions/Preconditions</td><td colspan="4">There are existing processing transaction in the local civil registry processing section</td></tr>
<tr><td colspan="2">Actions</td><td colspan="2">Expected Result</td><td colspan="2">Actual Result</td></tr>
<tr><td colspan="2">1. Choose a processing transaction in the table and click the check/complete button
2. Click the ‘cancel’ button on the modal that appeared</td><td colspan="2">1. The processing transaction will not be completed and will still be at the processing section page</td><td colspan="2">1. The processing transaction is not completed and is still at the processing section page</td></tr>
<tr><td>Status</td><td>PASSED</td><td>Severity</td><td></td><td>Priority</td><td></td></tr>
</table>

Test Case ID		F-117		UC Reference	Local Civil Registry Admin
Objective		Be able to view more details of transaction at the local civil registry transaction requests, processing section, and archives			
Assumptions/Preconditions		There are existing processing transaction in the local civil registry processing section			
Actions		Expected Result		Actual Result	
1. Click the body of a specific processing transaction		1. A modal will appear containing the details of a specific processing transaction		1. A modal appeared containing the details of a specific processing transaction	
Status	PASSED	Severity		Priority	

Test Case ID		F-118		UC Reference	Real Property Tax Admin, Business Permit Admin, CTC/Cedula Admin, Local Civil Registry Admin
Objective		Reject the transaction in the tax charges transaction requests, or processing section			
Assumptions/Preconditions		There are existing transactions in the tax charges, transaction requests, and processing requests			
Actions		Expected Result		Actual Result	
1. Choose a transaction in the table and click the cross button 2. Select the cause of rejection at the dropdown button on the modal that appeared 3. Press 'confirm' button		1. The transaction will disappear at the table and the user that requested it will have their transaction a 'rejected' status		1. The transaction disappeared at the table and the user that requested it had their transaction a 'rejected' status	
Status	PASSED	Severity		Priority	

Test Case ID		F-119		UC Reference	Real Property Tax Admin, Business Permit Admin, CTC/Cedula Admin, Local Civil Registry Admin
Objective		Prevent the rejection of a transaction with no selected cause of rejection in the tax charges, transaction requests, or processing transaction			
Assumptions/Preconditions		The admin didn't select any cause of rejection from the dropdown			
Actions		Expected Result		Actual Result	
1. Choose a transaction in the table and click the cross/reject button 2. Press 'confirm' button		1. Confirm button must be disabled. 2. An error message must be displayed		1. Confirm button was disabled. 2. An error message was displayed	
Status	PASSED	Severity		Priority	

Test Case ID		F-120		UC Reference	Real Property Tax Admin, Business Permit Admin, CTC/Cedula Admin, Local Civil Registry Admin
Objective		Cancel the rejection of a transaction in the tax charges, transaction requests, or processing transaction			
Assumptions/Preconditions		There are existing transaction request in the real property tax tax charges, transaction requests, or processing section			
Actions		Expected Result		Actual Result	
1. Choose a transaction request in the table and click the cross/reject button 2. Press 'cancel' button		1. Confirm button must be disabled. 2. An error message must be displayed		1. Confirm button was disabled. 2. An error message was displayed	
Status	PASSED	Severity		Priority	

Test Case ID		F-121		UC Reference	Registry Admin
Objective		View the Registry User List page			
Assumptions/Preconditions		Admin is logged in the system			
Actions		Expected Result		Actual Result	
1. 111.Click the 'Registry' dropdown button at the sidebar 2. Click the 'User List' button		1. Must view the Registry user list page		1. Viewed the Registry user list page	
Status	PASSED	Severity		Priority	

Test Case ID		F-122		UC Reference	Registry Admin
Objective		View the full information of a user's account at the user list registry			
Assumptions/Preconditions		There is an existing account in the system			
Actions		Expected Result		Actual Result	
1. Click the eye icon button if in desktop view or click the 'view full information' button if in mobile view		1. A popover should appear containing all the information entered by the user who created the account		1. A popover appeared containing all the information entered by the user who created the account	
Status	PASSED	Severity		Priority	

Test Case ID		F-123		UC Reference	Registry Admin
Objective		Edit the information of a user's account at the user list registry			
Assumptions/Preconditions		There is an existing account in the system			
Actions		Expected Result		Actual Result	
1. Click the eye icon button if in desktop view or click the 'view full information' button if in mobile view 2. Click the 'edit user' button 3. Change or add the personal information of a user using the text box 4. Click the 'save' button		1. User information should be changed and saved after saving		1. User information is changed and saved after saving	
Status	PASSED	Severity		Priority	

Test Case ID		F-106		**UC Reference**	CTC/Cedula Admin
Objective		View the CTC/Cedula Processing Section page			
Assumptions/Preconditions		Admin is logged in the system			
Actions		**Expected Result**		**Actual Result**	
1. Click the 'CTC/Cedula' dropdown button at the sidebar 2. Click the 'Processing Section' button at the sidebar		1. Must view the CTC/Cedula processing section page		1. Viewed the CTC/Cedula processing section page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-107		**UC Reference**	CTC/Cedula Admin
Objective		Complete a CTC/Cedula processing transaction at the processing section			
Assumptions/Preconditions		There are existing processing transaction in the CTC/Cedula processing section			
Actions		**Expected Result**		**Actual Result**	
1. Choose a processing transaction in the table and click the check/complete button 2. Click the 'confirm' button on the modal that appeared		1. The processing transaction at the processing section webpage will complete the transaction removing it from the webpage and changing the status of the transaction into 'complete' 2. A modal will appear after clicking the check/complete button 3. The processing transaction made by the user in their transaction history will have a 'complete' status		1. The processing transaction at the processing section webpage will complete the transaction removing it from the webpage and changing the status of the transaction into 'complete' 2. A modal appeared after clicking the check/complete button with a message to confirm the action with 'cancel' and 'confirm' button 3. The processing transaction made by the user in their transaction history became a 'complete' status	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-124		**UC Reference**	Registry Admin
Objective		Removing unsaved changes after editing the information of a user's account at the user list registry			
Assumptions/Preconditions		There is an existing account in the system			
Actions		**Expected Result**		**Actual Result**	
1. Click the eye icon button if in desktop view or click the 'view full information' button if in mobile view 2. Click the 'edit user' button 3. Change or add the personal information of a user using the text box 4. Click the 'cancel' button		1. User information should remain unchanged after canceling		1. User information is unchanged after canceling	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-125		**UC Reference**	Registry Admin
Objective		Be able to use the filter in the User List of Registry			
Assumptions/Preconditions		There are existing accounts in the system			
Actions		**Expected Result**		**Actual Result**	
1. Click 'filter' button 2. fill the filter by first name, last name, sex, mobile number, email, and status 3. Click 'filter' button at the popover		1. The displayed data is going to be filtered accurately and will only show the transactions by the filtered first name, last name, sex, mobile number, email, and status		1. The displayed data is filtered accurately and only shown the transactions by the and filtered first name, last name, sex, mobile number, email, status	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-126		**UC Reference**	Registry Admin
Objective		Remove all the information entered/selected at the filter popover at the user list of registry			
Assumptions/Preconditions		There are information entered/selected at the filter popover			
Actions		**Expected Result**		**Actual Result**	
1. Click 'clear' button		1. The previous information entered/selected at the filter popover should be cleared		1. The previous information entered/selected at the filter popover are cleared	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-127		**UC Reference**	Registry Admin
Objective		View the Registry User Verification page			
Assumptions/Preconditions		Admin is logged in the system			
Actions		**Expected Result**		**Actual Result**	
1. Click the 'Registry' dropdown button at the sidebar 2. Click the 'User Verification' button		1. Must view the Registry user verification page		1. Viewed the Registry user verification page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-128		**UC Reference**	Registry Admin
Objective		View the full information of a user's account that requested for account verification at the user verification registry			
Assumptions/Preconditions		There is an existing account in the system that sent a request for account verification			
Actions		**Expected Result**		**Actual Result**	
1. Click 'view full details' button		1. A popover should appear containing all the information entered by the user who created the account		1. A popover appeared containing all the information entered by the user who created the account	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-129		**UC Reference**	Registry Admin
Objective		Approve the verification request of a user's account			
Assumptions/Preconditions		There is an existing account in the system that sent a request for account verification			
Actions		**Expected Result**		**Actual Result**	
1. Click 'view full details' button 2. Click 'approve' button		1. The verification request should disappear 2. The profile picture of the user who requested for verification should receive a blue badge		1. The verification request disappeared 2. The profile picture of the user who requested for verification received a blue badge	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-130		**UC Reference**	Registry Admin
Objective		Decline the verification request of a user's account			
Assumptions/Preconditions		There is an existing account in the system that sent a request for account verification			
Actions		**Expected Result**		**Actual Result**	
1. Click 'view full details' button 2. Click 'decline' button		1. The verification request should disappear 2. The profile picture of the user will remain the same and will not receive a blue badge		1. The verification request disappeared 2. The profile picture of the user will remain the same and will not receive a blue badge	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-131		**UC Reference**	Registry Admin
Objective		Be able to use the filter in the User Verification of Registry			
Assumptions/Preconditions		There is an existing account in the system that sent a request for account verification			
Actions		**Expected Result**		**Actual Result**	
1. Click 'filter' button 2. fill the filter by name, sex, birthplace, birthdate, mobile number, and email 3. Click 'filter' button at the popover		1. The displayed data is going to be filtered accurately and will only show the transactions by the filtered name, sex, birthplace, birthdate, mobile number, and email		1. The displayed data is going t be filtered accurately and will only show the transactions by the filtered name, sex, birthplace, birthdate, mobile number, and email	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-132		**UC Reference**	Registry Admin
Objective		Remove all the information entered/selected at the filter popover at the user list registry			
Assumptions/Preconditions		There are information entered/selected at the filter popover			
Actions		**Expected Result**		**Actual Result**	
1. Click 'clear' button		1. The previous information entered/selected at the filter popover should be cleared		1. The previous information entered/selected at the filter popover are cleared	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-133		**UC Reference**	Chief Admin
Objective		View the Audit Trail page			
Assumptions/Preconditions		Admin is logged in the system			
Actions		**Expected Result**		**Actual Result**	
1. Click the 'Audit Trail' button at the sidebar		1. Must view the audit trail page		1. Viewed the audit trail page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-134		**UC Reference**	All Admins
Objective		Be able to use the filter in the Activity Log of Audit Trail			
Assumptions/Preconditions		There are history of actions saved at the activity log			
Actions		**Expected Result**		**Actual Result**	
1. Click 'filter' button 2. fill the filter by date, activity, admin and ID number 3. Click 'filter' button at the popover		1. The displayed data is going to be filtered accurately and will only show the transactions by the filtered date, activity, admin and ID number		1. The displayed data is filtered accurately and only shown the transactions by the filtered date, activity, admin and ID number	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-135		**UC Reference**	All Admins
Objective		Remove all the information entered/selected at the filter popover at the activity log			
Assumptions/Preconditions		There are information entered/selected at the filter popover			
Actions		**Expected Result**		**Actual Result**	
1. Click 'clear' button		1. The previous information entered/selected at the filter popover should be cleared		1. The previous information entered/selected at the filter popover are cleared	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-136		**UC Reference**	All Admins
Objective		Change admin profile picture			
Assumptions/Preconditions		Admin is at the settings page			
Actions		**Expected Result**		**Actual Result**	
1. Click 'upload profile photo' button 2. Click 'choose file' button 3. Select a 'PNG', 'JPEG' or 'JPG' image 4. Press the 'open' button 5. Press 'save changes' button		1. Profile image should be saved and displayed 2. 'Upload Image Successful' message should appear		1. Profile image is saved and displayed 2. 'Upload Image Successful' message appeared	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-137		UC Reference	All Admins
Objective		Remove Profile Photo			
Assumptions/Preconditions		Admin have existing profile photo			
Actions		Expected Result		Actual Result	
1. Click 'remove profile photo' button		1. Profile image should disappear 2. Default profile image should be displayed 3. 'Remove Successful' message should appear		1. Profile image disappeared 2. Default profile image is displayed instead 3. 'Remove Successful' message should appear	
Status	PASSED	Severity		Priority	

Test Case ID		F-138		UC Reference	Registry Admin
Objective		Be able to view all new user in the users list			
Assumptions/Preconditions		There is an existing account in the system			
Actions		Expected Result		Actual Result	
1. Click User list		1. User must be redirected to the user list page and must be able to view all users of the system		1. User was redirected to the user list page and was able to view all users of the system	
Status	PASSED	Severity		Priority	

Test Case ID	F-139	UC Reference	Real Property Tax Admin
Objective	View the RP Tax Archives Page		
Assumptions/Preconditions	Admin is logged in the system		
Actions	Expected Result	Actual Result	
1. Click the 'Archives' button at the sidebar	1. Must view the Archives page of RP Tax	1. Viewed the Archives page of RP Tax	

Test Case ID		F-140		UC Reference	Real Property Tax Admin
Objective		View the information of an archived transaction at the RP tax archives page			
Assumptions/Preconditions		Admin is at the RP tax archives page			
Actions		Expected Result		Actual Result	
1. Click a transaction		1. A modal should appear containing all the information of an archived transaction		1. A modal appeared containing all the information of an archived transaction	
Status	PASSED	Severity		Priority	

Test Case ID		F-141		UC Reference	Business Permit Admin
Objective		View the Business Permit Archives Page			
Assumptions/Preconditions		Admin is logged in the system			
Actions		Expected Result		Actual Result	
1. Click the 'Archives' button at the sidebar		1. Must view the Archives page of Business Permit		1. Viewed the Business Permit archives page	
Status	PASSED	Severity		Priority	

Test Case ID		F-142		**UC Reference**	Business Permit Admin
Objective		View the information of an archived transaction at the Business Permit archives page			
Assumptions/Preconditions		Admin is at the Business Permit archives page			
Actions		**Expected Result**		**Actual Result**	
1. Click a transaction		1. A modal should appear containing all the information of an archived transaction		1. A modal appeared containing all the information of an archived transaction	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-143		**UC Reference**	CTC/Cedula Admin
Objective		View the CTC/Cedula Archives Page			
Assumptions/Preconditions		Admin is logged in the system			
Actions		**Expected Result**		**Actual Result**	
1. Click the 'Archives' button at the sidebar		1. Must view the Archives page of CTC/Cedula		1. Viewed the CTC/Cedula archives page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-144		**UC Reference**	CTC/Cedula Admin
Objective		View the information of an archived transaction at the CTC/Cedula archives page			
Assumptions/Preconditions		Admin is at the CTC/Cedula archives page			
Actions		**Expected Result**		**Actual Result**	
1. Click a transaction		1. A modal should appear containing all the information of an archived transaction		1. A modal appeared containing all the information of an archived transaction	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-145		**UC Reference**	Local Civil Registry Admin
Objective		View the Local Civil Registry Archives Page			
Assumptions/Preconditions		Admin is logged in the system			
Actions		**Expected Result**		**Actual Result**	
1. Click the 'Archives' button at the sidebar		1. Must view the Archives page of Local Civil Registry		1. Viewed the Local Civil Registry archives page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		F-146		UC Reference	Local Civil Registry Admin
Objective		View the information of an archived transaction at the Local Civil Registry archives page			
Assumptions/Preconditions		Admin is at the Local Civil Registry archives page			
Actions		Expected Result		Actual Result	
1. Click a transaction		1. A modal should appear containing all the information of an archived transaction		1. A modal appeared containing all the information of an archived transaction	
Status	PASSED	Severity		Priority	

Test Case ID		F-147		UC Reference	Chief Admin
Objective		View the Add Administrator Page			
Assumptions/Preconditions		Admin is logged in the system			
Actions		Expected Result		Actual Result	
1. Click the 'Add Administrator' button at the sidebar		1. Must view the Add Administrator page		1. Viewed the Add Administrator page	
Status	PASSED	Severity		Priority	

Test Case ID		F-148		UC Reference	Chief Admin
Objective		Be able to add new administrator			
Assumptions/Preconditions		Admin is logged in the system			
Actions		Expected Result		Actual Result	
1. Fill up the Admin ID, Admin Name, Password, and select Admin Type 2. Click 'Confirm' button		1. A new admin should be added in the system		1. A new admin is added in the system	
Status	PASSED	Severity		Priority	

Test Case ID		F-149		UC Reference	Chief Admin
Objective		Canceling the adding of administrator after clicking the 'Add Admin' button			
Assumptions/Preconditions		Admin click the add admin button and prompt is displayed			
Actions		Expected Result		Actual Result	
1. Click 'Cancel' button		1. A new administrator should not be added and should close the prompt.		1. A new administrator is not added and the prompt is closed.	
Status	PASSED	Severity		Priority	

Test Case ID		F-150		UC Reference	Chief Admin
Objective		View the Admin List			
Assumptions/Preconditions		Admin is logged in the system			
Actions		Expected Result		Actual Result	
1. Click the 'Manage Accounts' button at the sidebar		1. Must view the Admin List page		1. Viewed the Admin List page	
Status	PASSED	Severity		Priority	

Test Case ID		F-151		UC Reference	Chief Admin
Objective		Be able to use the filter in the Admin List			
Assumptions/Preconditions		There are existing admin accounts in the system			
Actions		Expected Result		Actual Result	
1. Click ‘filter’ button 2. Fill the filter by admin username, admin name, and status. 3. Click ‘filter’ button at the popover		1. Admins must be displayed according to the filter		1. Admins are displayed properly according to the filter	
Status	PASSED	Severity		Priority	

Test Case ID		F-152		UC Reference	Chief Admin
Objective		Remove all the information entered/selected at the filter popover at the Admin List page			
Assumptions/Preconditions		There are information entered/selected at the filter popover			
Actions		Expected Result		Actual Result	
1. Click ‘clear’ button		1. The previous information entered/selected at the filter popover should be cleared		1. The previous information entered/selected at the filter popover are cleared	
Status	PASSED	Severity		Priority	

Appendix E

TEST CASES FOR SECURITY

Test Case ID		S-001		**UC Reference**	
Objective		To be able to login with valid user credentials			
Assumptions/Preconditions					
Actions		**Expected Result**		**Actual Result**	
1. On the landing page, enter valid credentials 2. Click login		1. User must be redirected to the home page		1. User was redirected to the home page	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		S-002		**UC Reference**	
Objective		To be able to display error message when logging in with invalid user credentials			
Assumptions/Preconditions					
Actions		**Expected Result**		**Actual Result**	
1. On the landing page, enter invalid credentials 2. Click login.		1. An error message saying "Authentication failed. Please check your credentials" should be displayed.		1. An error message saying "Authentication failed. Please check your credentials" was displayed.	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		S-003		**UC Reference**	
Objective		To be able to set up password that meets password requirements			
Assumptions/Preconditions					
Actions		**Expected Result**		**Actual Result**	
1. Attempt to create password that meets the password requirements.		1. The user must be able to use the newly created password when logging in.		1. The user was able to use the newly created password when logging in.	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		S-004		**UC Reference**	
Objective		To be able to display error message when creating password that doesn't meet password requirements			
Assumptions/Preconditions					
Actions		**Expected Result**		**Actual Result**	
1. Attempt to create password that doesn't meet the password requirements.		1. An error message saying "Password must be at least 8 characters long and include at least one uppercase letter, one lowercase letter, one symbol, and one number." should be displayed.		1. An error message saying "Password must be at least 8 characters long and include at least one uppercase letter, one lowercase letter, one symbol, and one number." was displayed.	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		S-005		**UC Reference**	
Objective		To be able to login when typing valid OTP			
Assumptions/Preconditions					
Actions		**Expected Result**		**Actual Result**	
1. Attempt to use mobile number and type valid OTP sent via SMS.		1. The user must be redirected to the homepage.		1. The user was redirected to the homepage.	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		S-006		**UC Reference**	
Objective		To be able to display error message when typing invalid OTP			
Assumptions/Preconditions					
Actions		**Expected Result**		**Actual Result**	
1. Attempt to use mobile number and type invalid OTP.		1. An error message saying "Wrong OTP. Please provide a valid OTP".should be displayed.		1. An error message saying "Wrong OTP. Please provide a valid OTP".was displayed.	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		S-007		**UC Reference**	
Objective		To be able to view admin activity in audit trail			
Assumptions/Preconditions					
Actions		**Expected Result**		**Actual Result**	
1. Click Audit Trails in the sidebar.		1. Details of activities of administrators within the system should be displayed.		1. All details of admin activities within the system are displayed.	
Status	PASSED	**Severity**		**Priority**	

Test Case ID		S-008		**UC Reference**	
Objective		To be able to completely cancel transaction			
Assumptions/Preconditions					
Actions		**Expected Result**		**Actual Result**	
1. Go to transaction history. 2. View details of the transaction which has pending status. 3. Click the Cancel Transaction button.		1. Transaction status should be updated to canceled. 2. Transaction could no longer be processed by the admin.		1. Transaction status should be updated to canceled. 2. Transaction cannot be processed by the admin.	
Status	PASSED	**Severity**		**Priority**	

Appendix F

TEST INCIDENT LOGS

<table>
<tr><td colspan="2">Test Case ID</td><td colspan="2">F-001</td><td colspan="2">UC Reference</td><td colspan="2">Unregistered User</td></tr>
<tr><td colspan="2">Objective</td><td colspan="6">Register with new mobile number</td></tr>
<tr><td colspan="2">Assumptions/Preconditions</td><td colspan="6"></td></tr>
<tr><td colspan="2">Actions</td><td colspan="2">Expected Result</td><td colspan="4">Actual Result</td></tr>
<tr><td colspan="2">1. Click ‘register here’ on the landing page
2. Fill out the form and put new mobile number
3. Click “Register”</td><td colspan="2">1. User must be redirected to the homepage and an email must be sent to the user</td><td colspan="4">1. User was not redirected to the homepage.</td></tr>
<tr><td>Status</td><td>FAILED</td><td>Severity</td><td>MINOR</td><td colspan="2">Priority</td><td colspan="2">MEDIUM</td></tr>
</table>

<table>
<tr><td colspan="2">Test Case ID</td><td colspan="2">F-010</td><td colspan="2">UC Reference</td><td colspan="2">Unregistered User</td></tr>
<tr><td colspan="2">Objective</td><td colspan="6">Be able to login with Facebook account</td></tr>
<tr><td colspan="2">Assumptions/Preconditions</td><td colspan="6">User is first time singing in using Facebook account</td></tr>
<tr><td colspan="2">Actions</td><td colspan="2">Expected Result</td><td colspan="4">Actual Result</td></tr>
<tr><td colspan="2">1. 1. On the landing page, click “Continue with Facebook”
2. Provide Facebook account credentials</td><td colspan="2">1. User must be redirected to register form where user can fill up his/her information</td><td colspan="4">1. Facebook login didn’t load</td></tr>
<tr><td>Status</td><td>FAILED</td><td>Severity</td><td>MINOR</td><td colspan="2">Priority</td><td colspan="2">HIGH</td></tr>
</table>

<table>
<tr><td colspan="2">Test Case ID</td><td colspan="2">F-11</td><td colspan="2">UC Reference</td><td colspan="2">Unverified User, Verified User</td></tr>
<tr><td colspan="2">Objective</td><td colspan="6">Be able to login with Facebook account</td></tr>
<tr><td colspan="2">Assumptions/Preconditions</td><td colspan="6">The user has previously logged in using their Facebook account</td></tr>
<tr><td colspan="2">Actions</td><td colspan="2">Expected Result</td><td colspan="4">Actual Result</td></tr>
<tr><td colspan="2">1. On the landing page, click “Continue with Facebook”
2. Provide Facebook account credentials</td><td colspan="2">1. User must be redirected to the home page</td><td colspan="4">1. Facebook login didn’t load</td></tr>
<tr><td>Status</td><td>FAILED</td><td>Severity</td><td>MINOR</td><td colspan="2">Priority</td><td colspan="2">HIGH</td></tr>
</table>

<table>
<tr><td colspan="2">Test Case ID</td><td colspan="2">F-024</td><td colspan="2">UC Reference</td><td colspan="2">Verified User</td></tr>
<tr><td colspan="2">Objective</td><td colspan="6">Be able to submit request for Real Property Tax Payment</td></tr>
<tr><td colspan="2">Assumptions/Preconditions</td><td colspan="6">User is on the tax payment page, agreed to the terms and conditions, and has field out all the required fields</td></tr>
<tr><td colspan="2">Actions</td><td colspan="2">Expected Result</td><td colspan="4">Actual Result</td></tr>
<tr><td colspan="2">1. Fill out all the required fields in the form with correct information. Then, click Proceed.
2. Click submit after reviewing the entered information</td><td colspan="2">1. A pop-up modal must correctly display all user-entered information for review.
2. User must be redirected to transaction history where the recent transaction is displayed and must be labeled as processing
3. Email and system notification must be sent to the user.</td><td colspan="4">1. A pop-up modal was not able to correctly display all user-entered information for review.
2. User was redirected to transaction history where the recent transaction is displayed but labeled as pending instead of processing.
3. Email and system notification was sent to the user.</td></tr>
<tr><td>Status</td><td>FAILED</td><td>Severity</td><td>MINOR</td><td colspan="2">Priority</td><td colspan="2">LOW</td></tr>
</table>

<table>
<tr><th colspan="2">Test Case ID</th><td colspan="2">F-028</td><th>UC Reference</th><td>Verified User</td></tr>
<tr><th colspan="2">Objective</th><td colspan="4">Be able to submit request for Business Permit</td></tr>
<tr><th colspan="2">Assumptions/Preconditions</th><td colspan="4">User is on the business permit page and has field out all the required fields</td></tr>
<tr><th colspan="2">Actions</th><th colspan="2">Expected Result</th><th colspan="2">Actual Result</th></tr>
<tr><td colspan="2">1. Fill out all the required fields in the form with correct information. Then, click Proceed.
2. Click submit after reviewing the entered information</td><td colspan="2">1. A pop-up modal must correctly display all user-entered information for review.
2. User must be redirected to transaction history where the recent transaction is displayed and must be labeled as processing
3. Email and system notification must be sent to the user.</td><td colspan="2">1. A pop-up modal was not able to correctly display all user-entered information and has missing information.
2. User must be redirected to transaction history where the recent transaction is displayed and was labeled as processing
3. Email and system notification was sent to the user.</td></tr>
<tr><th>Status</th><td>FAILED</td><th>Severity</th><td>LOW</td><th>Priority</th><td>MINOR</td></tr>
</table>

<table>
<tr><th colspan="2">Test Case ID</th><td colspan="2">F-067</td><th>UC Reference</th><td>Unverified User, Verified User</td></tr>
<tr><th colspan="2">Objective</th><td colspan="4">Be able to change profile photo</td></tr>
<tr><th colspan="2">Assumptions/Preconditions</th><td colspan="4">The user is at the settings page</td></tr>
<tr><th colspan="2">Actions</th><th colspan="2">Expected Result</th><th colspan="2">Actual Result</th></tr>
<tr><td colspan="2">1. Click ‘upload profile photo’ button
2. Click ‘choose file’ button
3. Select a ‘PNG’, ‘JPEG’ or ‘JPG’ image
4. Press the ‘open’ button
5. Press ‘save changes’ button</td><td colspan="2">1. New profile image should be saved and displayed.
2. ‘Upload Image Successful’ message should appear.
3. Profile icon must change to new uploaded image.</td><td colspan="2">1. ‘Upload Image Successful’ message have appeared but old profile photo appears when returning to settings</td></tr>
<tr><th>Status</th><td>FAILED</td><th>Severity</th><td>MINOR</td><th>Priority</th><td>HIGH</td></tr>
</table>

<table>
<tr><th colspan="2">Test Case ID</th><td colspan="2">F-068</td><th>UC Reference</th><td>Unverified User, Verified User</td></tr>
<tr><th colspan="2">Objective</th><td colspan="4">Be able to change the password</td></tr>
<tr><th colspan="2">Assumptions/Preconditions</th><td colspan="4">The user is at the settings page</td></tr>
<tr><th colspan="2">Actions</th><th colspan="2">Expected Result</th><th colspan="2">Actual Result</th></tr>
<tr><td colspan="2">1. Enter current password at the ‘current password’ textbox
2. Enter new password at the ‘new password’ textbox
3. Enter new password at the ‘confirm new password’ textbox
4. Press ‘change password’ button</td><td colspan="2">1. User must be able to change the old password.</td><td colspan="2">1. Password didn’t changed and no successful message.</td></tr>
<tr><th>Status</th><td>FAILED</td><th>Severity</th><td>MINOR</td><th>Priority</th><td>MEDIUM</td></tr>
</table>

Test Case ID		F-070		UC Reference	Unverified User, Verified User
Objective		Be able to delete account			
Assumptions/Preconditions		The user is at the settings page			
Actions		Expected Result		Actual Result	
1. Click the delete account button. 2. Click Ok		1. User must be redirected to the landing page. 2. User account must be deleted.		1. User was redirected to a bluescreen. 2. Can sign in using the same account, and lost its verified status.	
Status	FAILED	Severity	LOW	Priority	HIGH

Test Case ID		F-072		UC Reference	Unverified User, Verified User, All Admin
Objective		Be able to remove profile photo			
Assumptions/Preconditions		The user is logged in their account			
Actions		Expected Result		Actual Result	
1. Click remove profile photo.		1. Display must be reloaded showing a default profile photo		1. Display didn't reload and the profile photo is changed only if you go to other page	
Status	FAILED	Severity	LOW	Priority	LOW

Test Case ID		F-081		UC Reference	Real Property Tax Admin
Objective		Transfer a Real Property Tax Charges transaction into the awaiting payments			
Assumptions/Preconditions		There are existing transaction in the real property tax charges			
Actions		Expected Result		Actual Result	
1. Choose a transaction in the table and click the check/process button 2. Type the amount 3. Click the 'confirm' button on the modal that appeared		1. The transaction in the tax charges page will transfer into the awaiting payments page 2. A modal will appear with the information and input field after clicking the check/process button 3. The transaction will transfer from tax charges to awaiting payments		1. The transaction in the tax charges page transferred into the awaiting payments page 2. A modal appeared with the information and input field after clicking the check/process button 3. The transaction was not transferred from tax charges to awaiting payments	
Status	FAILED	Severity	MINOR	Priority	LOW

Test Case ID		F-082		UC Reference	Real Property Tax Admin
Objective		Canceling the transfer of a transaction in the real property tax charges after clicking the process button			
Assumptions/Preconditions		There are existing transaction request in the real property tax charges			
Actions		Expected Result		Actual Result	
1. Choose a transaction in the table and click the check/process button 2. Input amount 3. Click the 'cancel' button on the modal that appeared		1. The transaction will not be transferred into the awaiting payments and will still be at the tax charges page		1. The transaction in the tax charges page is not transferred into the awaiting payments and is still at the tax charges page but does not close the modal	
Status	FAILED	Severity	MINOR	Priority	LOW

Test Case ID		F-091		**UC Reference**	Business Permit Admin
Objective		Transfer a Business Permit Charges transaction into the awaiting payments			
Assumptions/Preconditions		There are existing transaction in the business permit charges			
Actions		**Expected Result**		**Actual Result**	
1. Choose a transaction in the table and click the check/process button 2. Fill the required fields 3. Click the 'confirm' button on the modal that appeared		1. The transaction in the business permit tax page will transfer into the awaiting payments page 2. A modal will appear with the information and input field after clicking the check/process button 3. The transaction will transfer from permit charges to awaiting payments		1. The transaction in the permit charges page transferred into the awaiting payments page 2. A modal appeared with the information and input field after clicking the check/process button 3. The transaction is not transferred from tax charges to awaiting payments	
Status	PASSED	**Severity**	MINOR	**Priority**	LOW

Test Case ID		F-092		**UC Reference**	Business Permit Admin
Objective		Canceling the transfer of a transaction in the business permit charges after clicking the process button			
Assumptions/Preconditions		There are existing transaction request in the business permit charges			
Actions		**Expected Result**		**Actual Result**	
1. Choose a transaction in the table and click the check/process button 2. Fill the required fields 3. Click the 'cancel' button on the modal that appeared		1. The transaction will not be transferred into the awaiting payments and will still be at the business permit charges page		1. The transaction in the permit charges page is not transferred into the awaiting payments and is still at the business permit charges page	
Status	FAILED	**Severity**	MINOR	**Priority**	LOW

Test Case ID		F-140		**UC Reference**	Registry Admin
Objective		Be able to view all new user in the users list			
Assumptions/Preconditions		There is an existing account in the system			
Actions		**Expected Result**		**Actual Result**	
1. Click User list		1. User must be redirected to the user list page and must be able to view all users of the system		1. User was redirected to the user list page and discovered some accounts were missing.	
Status	FAILED	**Severity**	MINOR	**Priority**	LOW

Test Case ID		S-009		**UC Reference**	
Objective		To be able to view admin activity in audit trail			
Assumptions/Preconditions					
Actions		**Expected Result**		**Actual Result**	
1. Click Audit Trails in the sidebar.		1. Details of activities of administrators within the system should be displayed.		1. Some of the admin activities are not properly displayed.	
Status	FAILED	**Severity**	MINOR	**Priority**	LOW

RESEARCHERS' PROFILE

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Skills

- Knowledgeable in Java, Bootstrap, HTML, CSS, ReactJS, and TailwindCSS
- Basic skills in Microsoft Office Applications

Accomplished Project/s

- **Online Document Request System**
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Skills

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Accomplished Project/s

- **TUP Manila COVID-19 Vaccination Monitoring System**
  Backend Developer
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Accomplished Project/s

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Skills

- Mainly frontend development, knowledgeable in HTML, CSS, Bootstrap, ReactJS, MySQL, PHP, C++, C, Java, and TailwindCSS
- Fundamentals in Adobe Photoshop and Adobe Illustrator

Accomplished Project/s

- **TUP Manila COVID-19 Vaccination Monitoring System**
  Frontend Developer
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Skills

- Frontend and Backend Development, Chatbot Development, Network Administration, and Database Administration
- Basic skills in Adobe Photoshop

Accomplished Project/s

- **TUP Manila COVID-19 Vaccination Monitoring System**
  Lead Developer
  Nov 2022 – Jan 2023

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Skills

- Knowledgeable in ReactJS, MySQL, HTML, CSS, Bootstrap, PHP, C++, C
- Skilled in using Microsoft Office Applications

Accomplished Project/s

- **Online Document Request System**
  Lead Document Manager
  April 2023 – July 2023

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Skills

- Knowledgeable in Java, Bootstrap, HTML, CSS, ReactJS, and TailwindCSS
- Skilled in using Microsoft Office Applications

Accomplished Project/s

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Citizenship:	Filipino

Skills

- Knowledgeable in C, C++, Java, PHP, Bootstrap, HTML, CSS
- Basic skills in Microsoft Office Applications

Accomplished Project/s

- **Online Document Request System**
  Backend Developer
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