

WEB-BASED PROJECT MANAGEMENT SYSTEM FOR EQUALIZER BUILDERS AND TECHNOLOGIES CORPORATION

A Capstone Project

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CHAPTER 1

THE PROBLEM AND IT'S BACKGROUND

This chapter discusses the introduction, background of the study, objectives of the study, scope and limitations, and the significance of the study.

Introduction:

Equalizer Builders & Technologies Corporation (EBTC) is a design and construction group specializing in civil/architectural and electro-mechanical services. The company originated as a spin-off from Equalizer Temperature & System Services, which was formerly part of a renowned firm involved in the installation of various air-conditioning systems, including split-type, package-type, centralized, and precision air-conditioning units, as well as air-duct systems. For a ventilation system, the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) suggests balancing the sub-main air ducts first, then branch ducts, and finally the flow rates of the air terminal devices (ASHRAE, 2019). Civil engineering mostly works on the structures and components of all government infrastructure (buildings, bridges, canals, dams, airports, railroads, etc.). The civilian engineer also operates transport facilities for water, air, and organic garbage and protects the environmental infrastructure. Electric power engineers focus on providing and efficiently utilizing electrical energy. In the area of communication networks, computer and amusement systems, medical devices, and automation motion control, electrical and electronics experts are involved. A considerable percentage of electrical and electronics experts go directly into the development and manufacturing of computers (Perval 2022). In response to the increasing digitalization of the construction

and service industries, EBTC recognizes the need for a professional online presence to showcase its expertise and effectively communicate with both current and potential clients.

Civil engineering plays a vital role in EBTC's operations, focusing on the design, construction, and maintenance of infrastructure such as buildings, bridges, dams, airports, and railroads. These efforts contribute to the development of efficient transportation networks, water management systems, and waste disposal facilities while ensuring compliance with environmental standards. Furthermore, EBTC's expertise in electro-mechanical services complements its civil engineering projects by integrating electrical and mechanical systems for power distribution, communication networks, and automated control systems. In this area, the company leverages advancements in technology to deliver energy-efficient and cost-effective solutions.

In line with the increasing digitalization of the construction and service industries, EBTC recognizes the importance of adopting modern tools and systems to remain competitive. The company has identified the need to streamline its project management processes and improve client interactions through the implementation of a specialized project management and appointment scheduling system. This initiative aims to address operational challenges related to project tracking, task assignments, and resource management, while also enhancing communication and service scheduling with clients.

Background of the Study:

Equalizer Builders and Technologies Corporation (EBTC), established in 2012 and headquartered in Xyris St., Pembo, Taguig City, is a well-recognized company in the

mechanical and industrial services industry. EBTC has built a reputation for delivering high-quality services, catering to a diverse clientele, including private companies, multinational corporations, and government agencies. The company specializes in a wide range of services, such as air conditioning and ventilation systems, sprinkler systems, plumbing, cleaning, repairs, and equipment supplies. It operates through its main office in Taguig City and maintains a secondary branch at North Harbour, Manila, further extending its reach and service coverage.

Despite EBTC's years of experience and its solid reputation established through client referrals and recommendations, the company faces challenges related to operational inefficiencies and a lack of streamlined processes for managing projects and appointments. At present, EBTC relies heavily on manual processes and traditional methods for coordinating client interactions and scheduling services. Field representatives handle bookings and follow-ups, often resulting in fragmented communication, missed opportunities, and scheduling conflicts. While the company employs Google Drive for storage and utilizes digital fingerprint systems for employee attendance tracking, these tools are not integrated into a centralized platform and are insufficient for addressing the company's growing operational demands.

The absence of an organized and automated system for handling project management and client appointments has become a barrier to EBTC's ability to scale its operations and meet the increasing expectations of its clients. As the company continues to expand its service offerings, the need for a more structured and systematic approach to managing workflows and resources has become increasingly evident. A lack of

centralized records management further complicates administrative processes, making it difficult to retrieve vital client data and track service histories efficiently.

To address these challenges, this study proposes the development of a Web-Based Project Management and Appointment System specifically designed to meet EBTC's operational requirements. The proposed system will feature a robust project management module that streamlines task assignments, monitors progress, manages documentation, and ensures collaboration among team members. Additionally, it will include an appointment scheduling module to optimize client bookings, minimize scheduling conflicts, and enhance communication through automated reminders and notifications.

The project management component will allow EBTC to track project timelines, monitor deliverables, and manage resources effectively, ensuring that tasks are completed on time and within budget. It will also include features for secure data storage, enabling administrators to retrieve and protect client records, service histories, and transaction details. Meanwhile, the appointment scheduling module will simplify the process of setting up service bookings, allowing clients to select specific services, choose preferred time slots, and receive confirmations promptly.

Furthermore, the system will integrate record management capabilities to ensure the secure and organized storage of critical data. Automated reporting tools will be implemented to generate analytical insights and performance summaries, providing administrators with valuable data for decision-making and strategic planning. The

inclusion of these features is expected to enhance EBTC's operational efficiency, improve client engagement, and support business growth.

Security and reliability are key considerations in the design of the proposed system. Advanced features such as multi-factor authentication, role-based access control, data encryption, session timeouts, and firewall protection will be incorporated to safeguard sensitive information and prevent unauthorized access. Regular automated backups will also ensure data integrity and recovery in the event of system failures or cyber threats.

By implementing this Web-Based Project Management and Appointment System, EBTC aims to modernize its operations, eliminate manual inefficiencies, and enhance its ability to deliver services effectively. The system will enable EBTC to manage projects and client appointments seamlessly, resulting in improved productivity, better resource allocation, and higher client satisfaction. Additionally, it will help the company maintain its competitive edge in the mechanical and industrial services sector, adapting to the evolving demands of digital transformation.

This initiative will not only address the company's current operational gaps but also position EBTC for long-term growth and sustainability. Through enhanced workflows, better data organization, and improved service delivery, the system will serve as a vital tool in supporting EBTC's mission to provide high-quality services and meet the needs of its expanding client base. Ultimately, the integration of this technology-driven solution will allow EBTC to focus on innovation, scalability, and continued excellence in the mechanical and industrial services industry.

Objectives:

The general objective of the study is to design and develop a secure and user-friendly **WEB-BASED PROJECT MANAGEMENT SYSTEM FOR EQUALIZER BUILDERS AND TECHNOLOGIES CORPORATION** for Equalizer Builders and Technologies Corporation.

The specific objectives of this study are the following:

1. Design a user-friendly and accessible online web application with the following features:

- a. Implement a Project Management
 - i. Store and protect client vitals and records, service records, and transaction records.
 - ii. Be certain that administrative records are both retrievable and secure.
 - iii. Help improve the company's functioning and provide a better understanding of the processes.
 - iv. Enable searchable records to quickly retrieve specific service details.
 - v. Include detailed logs for maintenance schedules and recurring services.
- b. Make an Appointment System
 - i. Allow the clients to schedule services such as repair, cleaning, fixing, and installation among others.

- ii. Let clients choose service types (such as air conditioning, plumbing, etc.), and set up appointments.
 - iii. Provide a real-time calendar to show available dates and time slots for appointments.
 - iv. Enable clients to reschedule or cancel appointments easily through the system.
- c. Integrate a Content Management System (CMS)
 - i. Let the administrators have the capability of updating the website's services and promotions without a lot of hassle.
- d. Provide Account Systems
 - i. To lend greater security to the service and provide for differentiated functionalities, it is necessary to create separate accounts for the clients and the administrators.
- e. Generate Reports
 - i. Organize an automatic report generation to express the appointments, services, and other factors essential for business.

2. Incorporating the following features aims to increase the system security:

- a. Multi-factor authentication (MFA) is another layer of security.
 - i. Incorporating multi-factor authentication (MFA) enhances system security by adding an additional layer of protection, requiring users to verify their identity through multiple methods before gaining access.

- ii. The 4-digit PIN code is one component of multi-factor authentication (MFA), which is designed to ensure that users verify their identity using multiple methods before gaining access to the system.

b. Password complexity

- i. Incorporating password complexity requirements strengthens system security by ensuring users create strong, hard-to-guess passwords through rules such as a minimum length, and the inclusion of uppercase letters, numbers, and special characters.

c. SSL certificates encrypt data sent between a user's device and the website.

- i. Implementing SSL certificates enhances system security by encrypting data transmitted between a user's device and the website, ensuring sensitive information remains protected from unauthorized access.

d. Firewalls

- i. Firewalls enhance system security by acting as a barrier, monitoring and controlling incoming and outgoing network traffic to protect against unauthorized access and potential threats.

e. Automated backups

- i. Automated backups improve system reliability by regularly saving data, ensuring it can be quickly restored in case of system failures, data loss, or hacking incidents.

f. Blocking Brute force attacks

- i. Blocking brute force attacks strengthens system security by detecting and limiting repeated failed login attempts, preventing unauthorized access through automated password-guessing methods.
- g. Anti SQL Injection
 - i. Implementing anti-SQL injection measures enhances system security by validating and sanitizing user inputs, preventing malicious SQL code from being executed, and protecting the database from unauthorized access or data breaches.
- h. Session Timeout
 - i. Session timeout improves system security by automatically logging users out after a period of inactivity, reducing the risk of unauthorized access if a session is left unattended.
- i. Role-Based Access Control
 - i. Role-Based Access Control (RBAC) enhances system security by restricting access to resources based on a user's role, ensuring users can only access information and perform actions relevant to their responsibilities.

3. Test the Web Application Prototype for EBTC:

- a. Ensuring Secure Transactions and Data Management:
 - i. Ensure and demonstrate how network security will prevent the actual transaction that occurs on the platform.

- ii. Ensure the protection of information, dates of appointments with clients, and other personal information.

b. Validating System Modules:

- i. Conduct all possible tests to all modules within the system such as the appointment system, record management system, content management system, as well as report generation module.
- ii. Make sure the features of the client and admin account ensure the security of accessing the platform.

c. Identifying and Resolving Issues:

- i. Find and report issues that can be seen as bugs, glitches, or security flaws in the system.
- ii. Seeing to it that the various interfaces of the application work appropriately and effectively under every possibility and in interaction with the user.

4. Using the following criteria to evaluate the system prototype in accordance with ISO 25010 standards:

- a. Performing a detailed assessment of the system to establish whether the system passed the ISO 25010 usability performance security and reliability assessment criteria.
- b. To make sure that the system supports the business transaction enhancing tenants' satisfaction and administrative gains.

- c. Conducting an evaluation process can help to confirm that the two most important parts of the application – the admin and the user dashboards are easy for users to navigate and meet the standards of usability.
- d. Building an evaluation report that will capture areas of improvement with a focus on the system performance security functionality and user experience and most importantly ensuring that the developed system complies with ISO 25010 and other regulatory requirements.

Scope and Limitations of the Study

Scope

This study focuses on the design, development, and evaluation of a project management and appointment scheduling system tailored to the needs of Equalizer Builders and Technologies Corporation (EBTC). The system aims to address the company's operational challenges by enhancing project planning, tracking, and execution while optimizing client appointment management.

The project management module will streamline task assignment, progress monitoring, and documentation to ensure efficient collaboration among team members and secure storage and retrieval of client and administrative records. Meanwhile, the appointment scheduling system will simplify client bookings, reduce scheduling conflicts, and automate notifications to improve communication and client engagement.

Key features include role-based access control to manage user permissions, automated report generation for project analysis and performance evaluation, and integration of advanced security measures such as multi-factor authentication, SSL

encryption, and firewalls. The system will undergo rigorous testing and evaluation based on ISO 25010 standards for usability, performance, security, and reliability.

Additionally, the system will be implemented as a web-based platform to ensure accessibility, scalability, and ease of use. This web-based approach will further support EBTC's operational efficiency, enhance client satisfaction, and promote sustainable business growth while addressing potential areas for improvement in usability and functionality.

Limitation

This project aims to enhance EBTC's operations, but it comes with several limitations that should be acknowledged. The system will be developed as a web application accessible through computers, mobile phones, and other devices, eliminating the need for a dedicated mobile app. However, it will not integrate with EBTC's existing tools, such as the biometrics system or Google Drive, requiring data management to be handled independently within the new platform.

The appointment scheduling feature will include basic functions like selecting service types and booking appointments but will not support advanced features such as automated reminders, real-time availability updates, or calendar syncing in the initial version. Similarly, the reporting feature will generate simple reports on appointments and services, without advanced analytics or detailed financial reporting.

Security measures, including secure logins and data encryption, and multi-factor authentication will be implemented. Additionally, the platform will serve primarily clients near EBTC offices in Taguig City and Manila, with no immediate plans for broader geographical expansion.

These limitations are designed to keep the project within scope and achievable with the available resources and timeframe. Future updates may expand the system's functionality and address some of the current constraints.

Significance of the Study:

This work is intended to give a return in the form the Equalizer Builders and Technologies Corporation web system:

The beneficiaries of the project are:

Equalizer Builders and Technologies Corporation: Indeed, the web application designed for EBTC will revolutionize the company's business processes for appointment scheduling management, record keeping, as well as report generation. It offers an overall working possibility, which will decrease manual effort and increase accuracy. Moreover, the promotion aim of the website will develop the company's recognizance, making it avail to a wider audience.

Client: Clients will be in a position to access booking services through the internet, select the services category that they want, and also fix a date that they wish to book the service. It will increase interaction and openness, thus helping clients understand EBTC's services more readily.

For Administrators and Staff: It will bring out the administrative and staffs of EBTC equipped with tools of handling contents and records efficiently. Such as auto issuing of reports and handling of data security issues will eliminate operational hitches to their ability to deliver quality service.

For the Mechanical Services Industry: This work proves the possibility of adopting digital solutions to enhance service delivery and operational management. This may make other companies in mechanical services industries feel the need to adopt such technologies thus helping towards the development of the industrialization of mechanical services industries.

For Future Researchers: This research offers a framework for designing and deploying organizational solutions of effective and specific digital technologies for organizations with extensive and diverse clientele. They provide real-life solutions to top issues facing organizations, including security, data management, and integration in the corporate world.

CHAPTER 2

CONCEPTUAL FRAMEWORK

REVIEW OF RELATED LITERATURE AND STUDIES

The literature reviewed in this chapter included related international, national, and local literature, and all of them were closely related to the study. In addition, the synthesis provided the literature and studies summed up and more importantly, overall associations at the conclusion of this chapter.

Project Management System

As said by Radoslaw. (2022) It was feasible to examine the most crucial facets of project management thanks to the factors discussed in the paper. The investigation of fundamental project management concepts is the main focus of the article, particularly in light of Industry 4.0. We focused on industrial organization in the analysis and attempted to describe the primary advantages of applying the project approach in those businesses. We identified the primary advantages of project management in Industry 4.0 industrial enterprises. This method is particularly crucial for managing complicated, expensive, and dangerous projects that are difficult to manage the conventional way. In Industry 4.0 we can spot many of those types of interdisciplinary projects linking the technical and social knowledge. In those situations using a project management approach can lead to the success of organization activities. Detailed analysis of all subjects related to the problems connected with project management in engineering organizations.

This study investigates how to incorporate sustainability indicators into building project management procedures, according to Stanistsas et al. (2021). Numerous indicators and important criteria are revealed in the current literature as being involved in the sustainability success of construction projects. However, it is challenging to guide project managers toward their appropriate use due to the absence of a comprehensive classification. This study adds to the body of knowledge on sustainable project management for construction projects in two key ways: (1) it offers a comprehensive perspective on sustainable project management indicators, encompassing the entire triple constraint (TBL); and (2) it gives practitioners the option to select the appropriate combination of indicators based on the sustainability focus they wish to incorporate into their projects.

In the past ten years, the Fourth Industrial Revolution has brought about a significant impact on the construction industry from smart technology (Zhu et al., 2022). The performance of the construction business could be enhanced by smart technologies. The industry needs a comprehensive grasp of the particular uses of smart technology in construction project management because of the increasingly complicated projects and the severe labor scarcity brought on by the pandemic. The study's conclusions add to the body of knowledge on project management by illuminating the ways in which smart technology might enhance project management procedures and output. Furthermore, the findings offer industry practitioners a thorough manual on the particular uses of the chosen smart technologies in construction project management, which can act as a springboard to help the sector undergo a digital transformation. Additionally, by providing

industry practitioners with a comprehensive guide on the specific applications of the selected smart technologies in construction project management, the findings might serve as a catalyst for the sector's digital transformation.

Data Security and Privacy Compliance

Through digital connectivity, smart cities guarantee a better quality of life for the general public, increasing accessibility and efficiency in urban areas. Additionally, throughout the various private and public sectors, including critical infrastructures, financial sectors, healthcare, and Small and Medium Enterprises (SMEs), a vast amount of data is being shared via smart devices, networks, cloud infrastructure, big data analysis, and Internet of Things (IoT) applications. However, in order to guarantee the confidentiality and integrity of sensitive and important data, these industries must maintain specific security measures. However, because of the weaknesses in their information management systems that are exploited by attackers or malicious insiders, organizations regrettably neglect to maintain their security posture with regard to security mechanisms and controls, which results in data breach incidents that are either purposeful or unintentional. The significance of data breaches and problems associated with information leakage incidents are emphasized in this study. The well-being of residents is particularly impacted by data breach occurrences and the factors that lead to them. This article also covers a number of preventive measures, including follow-up mitigation techniques, security mechanisms, regulations, standards, processes, and best practices. (Aslam et al., 2022).

Our empirical results support the necessity for improved communication between the engineering and legal teams when putting technical data privacy protections into place

(Klymenko et al., 2022). We argue that a more comprehensive understanding of technical measures—which at the moment lacks a widely recognized concept—requires interdisciplinary collaboration. However, as our findings clearly indicate, systematic approaches to this kind of interaction are still lacking. The findings thus reinforce our belief that more research into the technical-legal dynamics of data privacy compliance is necessary.

There are two main tenets of the General Data Protection Regulation (GDPR), which is the data protection law of the European Union (Ke et al., 2022). The rights to (i) express consent (data opt-in), (ii) to be forgotten (data erasure), and (iii) portability (data transfer) are three essential privacy rights that result from acknowledging that people own and control their personal (but not contractual) data in perpetuity. Mandates for data security are also included to prevent privacy violations due to illegal access. By including these characteristics in a dynamic two-period model of forward-looking businesses and consumers, we investigate the equilibrium impact of GDPR. Businesses gather customer information for price discrimination and customization. When making judgments about purchases, data opt-in, deletion, and transfers, consumers weigh the benefits of personalization against the possible costs of privacy violations and pricing discrimination.

Web-Based Applications

Construction projects are typically characterized by their size, complex technology, lengthy completion times, and difficult teamwork, according to Zhao et al. (2022). Some of these issues can be resolved by offering digital representations that incorporate geospatial data and physical attributes. In order to combine information at the micro and

macro levels into a single domain without requiring conversion between data standards or the use of any intermediary format, the current study suggests a novel method of integrating building information modeling (BIM) into the geographic information system (GIS) domain. Furthermore, without knowing the correct points beforehand, this study offers a method for automatically georeferencing the BIM model in the GIS domain. An integrated BIM+GIS web-based platform that enables multiple stakeholders to access project information from disparate geographic locations was created based on the suggested integration methodology. This improves information sharing and streamlines project management. A large-scale construction project was managed using the built platform to assess its functionality and viability. The findings show that the process of incorporating BIM into the GIS domain was precise and successful, and the created platform may assist in effectively managing a large-scale project by offering the necessary data and features.

Another study shows that through displays that comprise products to be held in the warehouse and incoming and outgoing product transactions, this web application is classified as an inventory application (Pasaribu, 2021). Research and development (R&D) is the research methodology employed here. Software is created using a waterfall model that includes the following steps: requirements analysis, design, implementation, and testing. Using visual UML in an object-oriented paradigm modeling system. The study's output is web-based software created utilizing the Model View Controller (MVC) technique and the Yii Framework. It is envisaged that a web application that offers direct communication will make the customer service procedure quick and easy. This inventory application can be used as material for product inventory in warehouse stock which

includes recording, processing, and reporting data on warehouse inventory. Another benefit is that with this web-based application, the head office can know the inventory in the warehouse by itself so that it can quickly take action to fill the warehouse inventory.

According to Deng et al. (2022). This study focuses on the systematic analysis of a BIM model and interactive visualization of IFC data for MEP engineering. First, the systematic analysis method for a ventilation system is proposed using the critical path class. Second, referring to the IFC relationship of connections between duct elements, elements in the same system are sorted into different levels of critical paths. Furthermore, ifcPressureViewer is developed based on the interactive visualization methodology by connecting Three.js, a JavaScript 3D library, with Echarts, a JavaScript visualization library, which is applicable for desktop computers and mobile tablets. This is followed by a case study that demonstrates the application of the interactive visualization process. Finally, the conclusions of this study are summarized, and directions for future research are discussed.

According to Hartati et al. (2021), the study's findings led to a product delivery application that may offer details about the business, its most recent stock, and its prices at PT. Palembang City's Prima Fabian Mandiri. Black box testing was the method of system testing employed in this study, while the use questionnaire was utilized to assess usability. All of the assertions are deemed valid and reliable based on the findings of validity and reliability tests computed using SPSS 25, which indicates that customers are happy with the PT application's usefulness based on the five variables. Palembang City's Prima Fabian Mandiri. Administrators, customers, logistics professionals, and business executives use this product sales application.

Cloud-Based Security and Data Privacy

Some technological trends have surfaced in recent years, particularly in cloud-based data warehousing, according to Ahmadi (2024). Organizations and associations employ cloud-based data warehousing to store massive amounts of data. However, there are a number of hazards and difficulties associated with this type of data warehousing, including privacy issues. Data breaches, virus attacks, and data theft—all of which contravene legislative privacy regulations like the Consumer Privacy Act—are among the main security issues. These risks can be managed by taking certain steps, such as data ownership and contractual agreements. This paper's main goal is to talk about the security and privacy issues with cloud-based data warehousing that both government and private businesses use. Complex cloud computing models, dynamic environments, and interconnected ecosystems are a few significant obstacles.

Based on Yadav et al. (2024) as more and more data is exchanged, the rights and protection of shared information are being jeopardized. Thus, security and privacy are raising important issues. Every piece of information on online social media platforms needs to be shielded from unwanted access. It is challenging to store this vast amount of data due to the sharp increase in social media users. Cloud provides a place to store data generated by social media as a solution. Cloud-based services are used to handle such vast amounts of data because they offer a variety of services, including platform-based services, storage-based services, and many more. This is because maintaining such large amounts of data is quite expensive. Nonetheless, there are still issues with safeguarding users' private data on cloud-based social media. Users are unaware of

these issues. They primarily post on media websites, along with various images, videos, and personal information that endures even after being removed. Social media data has increased the likelihood that people would divulge sensitive information, even though some of the leaked material is meant to be confidential.

This is also because their consumers take the chance to believe them, and they collect a great deal of confidential information. Violating a target user's confidentiality is made considerably easier when sufficient personal information is shared with the public. Thus, safeguarding social media data in the cloud is one of the main issues with cloud-based social media. An overview of privacy and security concerns with cloud-based online social media is provided in this study. In online social media, we're introducing a taxonomy of privacy and security dangers, assessing existing strategies to reduce those risks, and pointing out issues that still need to be resolved.

ISO 25019

According to Mengesha et al. (2024), the quick rise in software demand and usage is causing natural resource consumption to rise, which is having an effect on society and day-to-day living and endangering future requirements. Software sustainability is becoming more popular in studies as a solution to these issues. It highlights how crucial it is to address the demands of the next generations while lessening the overall impact of software in a number of ways. The objective is to lessen the detrimental impacts that traditional software development methods have on the sector. The purpose of this study is to comprehend how industry professionals view software sustainability and the techniques that are currently associated with it. 23 individuals with substantial industry

experience were included in the study, which aimed to collect perspectives from practitioners operating in Sweden. The findings reveal that more than one-third of respondents are unaware of the term “software sustainability” and those who are aware tend to focus on only partial dimensions—specifically technical, environmental, and social aspects. The study also finds that the current level of implementation of software sustainability in the industry is inadequate.

Scientific research is confronted with thus far unprecedented difficulties in this quickly changing digital age when new technologies are affecting every industry (Ammari et al., 2024). Information and communication technologies' ongoing development has shifted academics' conventional methods, as they have realized that they must change to satisfy the ever-increasing needs of this new digital landscape. The ongoing development of information and communication skills in scientific research within a digital environment is a contemporary phenomenon that is the subject of this intriguing study in the context of education and training sciences. According to the PDCA technique, the framework selected for this study is organized around the digital environment and its resources as well as the elements of the sustainable development of information and communication skills.

A review of the existing literature indicates that much of the research focuses primarily on a single climate adaptation strategy or modeling method. The ISO framework makes it possible to compare various software tools using a common set of user-relevant standards. Despite its size, the ISO framework is rarely used in other studies to compare different approaches to climate adaptation. General software characteristics such as user interface, dependability, accuracy of information, compatibility, graphics quality, and

comfort prediction index are evaluated in the aforementioned study. Although the ISO standard includes user interface considerations in usability tests, this study purposefully does not include subjective evaluations of user interfaces because of the variety resulting from individual preferences. Other relevant factors that are not covered by the ISO framework include project-specific flexibility and software costs. In order to determine the most effective tool, Diéguez (2021) conducted a thorough analysis of outdoor thermal comfort simulations, comparing eight different software programs (Al-Bdour, 2019).

Record Management System

It is widely accepted that an organization's or institution's capacity to manage its records may be a necessary condition for efficient administration. Bayelsa State Higher Education believed that effective records management might help organizations accomplish their mandate, manage their information effectively, avoid lawsuits, preserve their corporate memory, and promote accountability and good governance. Ineffective record-keeping not only impedes an organization's growth but also results in inefficient service delivery. Whether they are official or personal, records are crucial to an organization's operation. Effective records management practices that guarantee the appropriate records are available at the appropriate time for efficient business operations are essential to any organization's success. It is undeniable that keeping accurate records is essential; it is a standard and required part of almost every corporate function. Only when a policy is in place to direct the management of documents can transparency and accountability be attained. (Touray, R., 2021).

Multi-Factor Authentication

User login credentials are known as authentication factors, and they are provided to an authentication process so that it can determine whether to allow or prohibit access. Authenticating a user's credentials is crucial for ensuring security when they access their accounts online. Verification of the credentials a user provides to demonstrate their identity is part of an authentication procedure. The developing field of cyber-related Internet of Things (IoT) is causing a change in authentication mechanisms. Globally, businesses, particularly those in the healthcare industry, are quickly implementing IoT-oriented authentication solutions. Extra security layers are provided by multi-factor authentication (MFA), which means that at least two factors have been verified. In addition to a straightforward method of user authentication, like a password, a one-time password (OTP) is sent to a user's email address or mobile device to generate a time-based code. Stronger authentication techniques, such as hardware solutions combined with biometric data to improve MFA approaches, are the outcome of the security criteria specified. We pinpoint the main weaknesses of less effective security measures, including using passwords, against different online dangers. (Suleski et al., 2023).

Meeting the goal of safeguarding valuable assets, the use of multi-factor authentication – or MFA – has been adopted widely. As for making the login more secure, t-factor authentication (TFA) will always demand at least t-defined factors not to mention just a password mentioned for login. However, when possible uses of factors are restricted, the applicability of the framework may be reduced; for instance, the user might be allowed to use any available factor when authenticating a login. We propose a new

type of authentication called (t,n) threshold MFA whereby a user is able to choose t out of n factors actively and reinstate original convenience and adaptability to the process. For the new concept, we also describe what was previously called the multi-factor security model, “most-Rigorous”, where the attackers are given complete control of the public channel, as well as, the ability to initiate active or passive attack, in addition to also having the ability to compromise or alternatively corrupt any arbitrary subset of the factors as well as the parties. We assert that the model is capable of capturing the most realistic security requirements documented in the literature. In our proposed work, we develop an authenticated key exchange protocol and a threshold oblivious pseudorandom function as the prerequisite to our threshold MFA key exchange (T-MFAKE) protocol. The debased (t,t) type of our protocol guarantees the strongest security than many general schemes and the highest computational and communication requirement compared to other tFA strategies. To show that our concept is workable and functional, we reproduce it in a live environment. (Li et al., 2021).

Multi-factor authentication is an electronic authentication technique that can be used to access an application or website if the computer user is in a position to provide at least two or more factors or proof. Because the hackers can easily guess the conventional means of getting into the system (passwords, usernames), this is the first line of defense against the hackers. Other security measures used in current systems include the emerging biometric- or token-device login or second-factor login based on an e-mailed or mobile-communicated one-time password. However, these techniques

require additional hardware equipment that is within the reach of small or medium-scale enterprises. (ALSaleem et al., 2021).

Role-Based Access Control

Information security has grown to be a major concern for system administrators in enterprises during the past few decades (Kamboj et al., 2021). However, because of its lower administrative cost, the Role-Based Access Control (RBAC) paradigm has become a feasible option for businesses to satisfy security needs. Distributive in nature, blockchain technology can be applied successfully to problems with user authorization and authentication. In order to manage user-role permissions within the company, this article suggests an RBAC architecture that makes use of a blockchain-based smart contract. In an organization scenario, we create a threat and security model to fend off attacks like man-in-the-middle attacks. The suggested method models user-resource communications using the Ethereum blockchain technology and its smart contract features.

Role-based access control, or RBAC, is used for authentication in the field of information and communication technology (Fragkos et al., 2022). However, static RBAC administration can be ineffective, expensive, and potentially dangerous for cybersecurity because organizational access control (AC) systems have a lot of entities. Based on the ideas of Bayesian belief networks and offline deep reinforcement learning (RL), a novel hybrid RBAC model is presented in this research. The architecture under consideration makes use of a fully offline RL agent that models user behavior as a Bayesian belief-based trust indicator. As a result, off-policy learning dynamically improves the initial static

RBAC policy while ensuring internal users adhere to the system's security regulations. By deploying our implementation within the smart grid domain and specifically within a Distributed Energy Resources (DER) ecosystem, we provide an end-to-end proof of concept of our model. Finally, detailed analysis and evaluation regarding the offline training phase of the RL agent are provided, while the online deployment of the hybrid RL-based RBAC model into the DER ecosystem highlights its key operation features and salient benefits over traditional RBAC models.

Appointment System

The use of an online scheduling and booking system in the healthcare industry can provide significant benefits for both patients and healthcare providers. It allows patients to schedule appointments easily and efficiently, saving them time and providing more access to healthcare. For healthcare providers, it can improve scheduling processes, minimize patient wait times, and provide a more efficient and streamlined scheduling process. The evolution of technology and the internet has made it easier for patients to access healthcare and for healthcare providers to manage their patients records and appointments.

Even though several clinics serve patients in more than one stage (e.g., visit nurse and then visit doctor) and employ multiple providers in each stage, most of the previous work on appointment system design considers a simplified single-stage single-server clinic. Motivated by a real-life clinic setting, this paper aims to determine the schedule

configuration of a hybrid appointment system (i.e., the number of pre-booking and same-day time slots reserved for a physician along with their positions in the schedule) for a two-stage multi-server clinic. A stochastic optimization model is developed to obtain a schedule configuration that minimizes the expected total cost - a weighted sum of excessive patient waiting time, resource idle time, resource overtime, and denied appointment requests.

In life and in business one will often encounter a variety of appointments, be it a job interview, business meeting, or even just agreeing on a convenient time to meet up with old friends. Appointments are important as it ensured that time will not be wasted and will be given the value that it commands. According to Qmatic from the article, The Guide to Appointment Scheduling, "Appointment scheduling removes friction by reducing waiting time." Many offices have plenty of visitors every day. If all these visits were solely walk-ins, a disordered environment is inevitable. The massive workloads which can occur during peak hours contribute to increased stress among employees. By enabling clients to schedule appointments, an office can improve the work environment. Setting an appointment creates opportunities for improved staff planning and will certainly avoid client dissatisfaction. Clients can schedule their arrival close to their appointment time, which can considerably improve their waiting time and therefore help to prevent crowds in the waiting room. This way, an office can keep control of the customer flow and optimize resources, while also reducing or even eliminating unexpected crowds. An appointment system is a solution that makes it easy for service providers to manage appointments. As stated in the article, Patient flow

management for seasonal flu and COVID-19 vaccinations, Graham Gidley explained that an appointment booking system enabled you to keep the patient flow constant throughout the date, making slots available that match your capacity to provide service. This way, you can prevent a rush of crowds in the lobby and other waiting rooms. Many service providers who implemented appointment systems, therefore, experienced improved operational efficiency. Appointment system was the simplest way to make sure your customers do not need to spend time waiting on premises until it was their turn to be served. As John Wordingham expresses it in the article, Appointment scheduling: Beyond booking functionality; "Whether you were working in a company, a clinic or the public sector, appointment scheduling creates opportunities for improved staff planning. You get a better overview of how many visitors arrive daily, enabling you to reduce their waiting time and to increase their customer experience

Synthesis

Chapter 2 presents a review of the literature on the emergence of secure, effective, and friendly web-based applications. The core of the conversation revolves around data protection and privacy regulation, owing to the current extensive connectivity and cyber risks. The chapter emphasizes the need to use strong protective safeguards like, encrypting data, ensuring proper channels of transferring data, use of MFA to protect the information, and conform to the current laws like the GDPR. Additionally, it discusses how web-based systems can increase organizational effectiveness, accessibility and decision ability through design methodologies such as the waterfall model and MVC framework for organizing developmental activities, inventory management, and client relations.

It also highlights the critical importance of implementing a robust record management system in supporting organizational transparency, the ability to retrieve the information, and corporate accountability to the legislation. These systems are presented as necessary for the efficiency of organizational processes and for the provision of accurate information as a means of ensuring success in these processes at an organizational level. Further, the rise in the utilization of MFA is brought up as a key plan for strengthening security in areas affected by IoT with measures namely advancing upon the risks posed by the conventional password security systems.

In an effort to encapsulate these findings, this chapter presents the Input-Process-Output (IPO) framework to encompass the identified elements that comprise inputs, including software and hardware, and systematic processes such as data gathering, system analysis, and iterative development processes. The purpose of this framework is to provide a comprehensive model for constructing modern, secure, efficient, and service-based Information Management systems for organizations that will improve their decision-making processes, organizational efficiency, and client satisfaction.

The literature that has been under consideration implies that MIS and RBAC are pivotal in enhancing work effectiveness and user satisfaction, as well as security in different areas. This paper proves that MIS leads to digital transformation, especially in the educational sector where its application improves on administrative work, decision-making, and service provision. According to Idroes et al., 2023 and Ilham et al., 2022, MIS can enhance user satisfaction, the usage of the system, and educational

effectiveness with resources and the operation. These include data with students, teachers, and facility data, attendance processes, and fee processes. It underlines the need for usability testing for MIS to fit organizational goals, with recommendations for future research based on large data sets, qualitative research, and performance analysis of MIS.

RBAC on the other hand has been embraced as a crucial security model in organizations to manage access control. Kamboj et al. (2021) described the integration of blockchain with RBAC and smart contracts to update the user-role permission and to protect against recognized cyber threats, including man-in-the-middle attacks. Like the previous two articles, Fragkos et al. (2022) propose a hybrid RBAC model consisting of Bayesian belief networks and reinforcement learning for dynamically adjusting access policies to minimize the negative impact of static RBAC systems. The two papers also look at the benefits of RBAC as a viable and practical solution to organizations' access control issues as it offers cost-efficient and secure solutions as it is pointed out when complemented with breakthrough technologies such as blockchain and artificial intelligence.

CONCEPTUAL MODEL OF THE STUDY

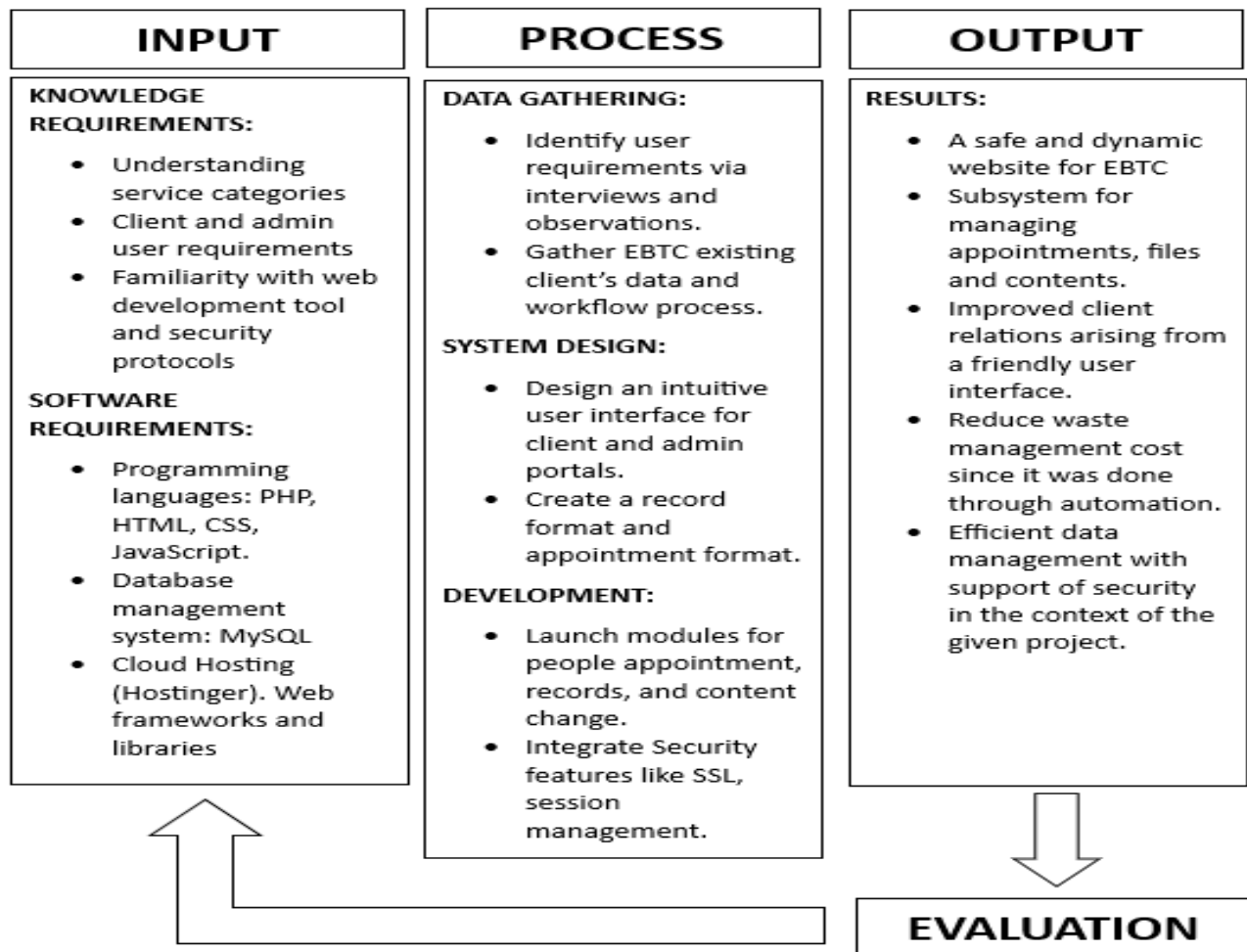


Table 2.1: Web-Based Information Management System

Table 2.1 specifies the Input-Process-Output (IPO) framework for the conceptual model of the Property Information Management System. It envelopes any kind of project development from right from the requirements to the result in the sequential order as given, all in an organized methodology of development.

The Input of the conceptual model lays down the groundwork of the system, which consists of three components: For the purpose of this study, the following categorizations have been made: Knowledge, Software, and Hardware. For example, understanding what is needed to do property management, the ability to use PHP and MySQL, HTML CSS and JavaScript, and appropriate hardware for the creation and trial and error.

The Process of the conceptual model involves the following stages Data Gathering, Analysis, Design, and Development. It starts with knowledge acquisition from the application's stakeholders resulting in system requirements followed by analysis-to-derived requirements and security requirements. It commonly includes the use of development methodologies together with the customary, most critical phase of creating required functionality and implementing it securely.

The Output of the conceptual model explains the results: Designed and available Property Information Management System that is user friendly, secure and helps clients in managing properties having enough and powerful data acquisition and analytical tools that enhance the quality of decision making.

DEFINITION OF TERMS

Project Management System: A software application designed to assist in planning, organizing, and managing resources to achieve specific project goals and objectives efficiently. It enables task assignment, progress tracking, and collaboration among team members.

Appointment System: A scheduling tool that facilitates booking and managing client appointments. It helps prevent scheduling conflicts, automates reminders, and improves communication between clients and service providers.

Content Management System (CMS): A software platform that allows administrators to create, manage, and modify digital content easily without requiring extensive technical knowledge. It simplifies the process of updating services, promotions, and other information.

Data Security and Privacy Compliance: Data security or privacy compliance refers to the legal observation and standards to ensure that the data is protected, and its confidentiality, integrity, and legal use are untouchable.

Password Complexity: Security standards requiring users to create strong, hard-to-guess passwords with a mix of uppercase letters, numbers, and special characters.

Web-Based Applications: It is an Internet-based system that enables real estate operations accessibility as well as administration through a web browser environment.

Cloud-Based Security and Data Privacy: to protect data from premature exposure or from just any individual or entity, security policies, and measures as well as privacy policies are implemented in cloud environments.

ISO 25010 Standards: An international standard for evaluating software quality based on characteristics such as functionality, performance, reliability, usability, security, maintainability, and portability. It ensures systems meet quality requirements and perform effectively in real-world scenarios.

Cloud Hosting: Cloud hosting is a kind of web hosting service that utilizes the Internet to store, manage and process data with the help of several virtual servers.

CSS (Cascading Style Sheets): It is a stylesheet language to which web designers apply to style HTML documents. CSS controls the positions, graphics, hues, typefaces, and appearance of the content of the web page.

JavaScript: It is a scripting language applied in web browsers for the development of objects on web pages.

SSL (Secure Sockets Layer): This is a usual safety measure that clicks between a web server and the users' browser to create a special, secure connection.

MySQL: It is a relational database management system (RDBMS) that is open-source. MySQL utilizes an industry-standard language called Structured Query Language (SQL) commonly used to store, manipulate and retrieve data.

PHP: It is a scripting language that runs on servers and is used to create websites. Dynamic and interactive web pages are generated by PHP using server processing and delivered to the user's browser

HTML (Hypertext Markup Language): This indeed forms a popular markup language that web developers use to code and hence develop the framework of web pages.

Chapter 3

RESEARCH METHODOLOGY

In this chapter, a detailed account of the research methodology employed in the study is presented. The location of the study conducted; the type of study design and the population and sample under study. Details of the instrument utilized in the study to gather information about the research questions are provided together with measures employed to ensure the validity and reliability of the instrument.

RESEARCH DESIGN

The techniques employed by the investigators for a systematic approach to the specific concerns raised in the chapter are highlighted here. Details of the population and sampling technique, research instrument, data collection strategy, study design and methodology, and data treatment in order to ensure correct analysis of data and information presentation were also discussed in this chapter. This chapter also talks about the methodologies adopted during a study when conducting the research. It covers the research methods of the study from the choice of research strategy to data analysis and result disclosure.

The purpose of this study is to design and evaluate a web-based appointment scheduling and management system for Equalizer Builders and Technologies Corporation (EBTC), aimed at streamlining operations and improving client interaction.

By integrating appointment scheduling, service requests, client communication, and other key activities into a single platform, this study adopts a mixed-methods approach to combine quantitative data on system performance and security with qualitative feedback from users. This approach provides a well-rounded understanding of the system's impact on operational efficiency and client satisfaction. Bigler et al. (2019) highlight that mixed-methods research, which combines quantitative and qualitative data, is ideal for generating actionable insights in social science fields, particularly when aiming for interventions or policy outcomes. Given the complexity of the issues being addressed, a mixed-methods approach is essential, as it captures a more comprehensive view of the problem. However, some research questions may still benefit from a more focused, single-method approach, as noted by Bassi et al. (2019).

PROJECT DEVELOPMENT

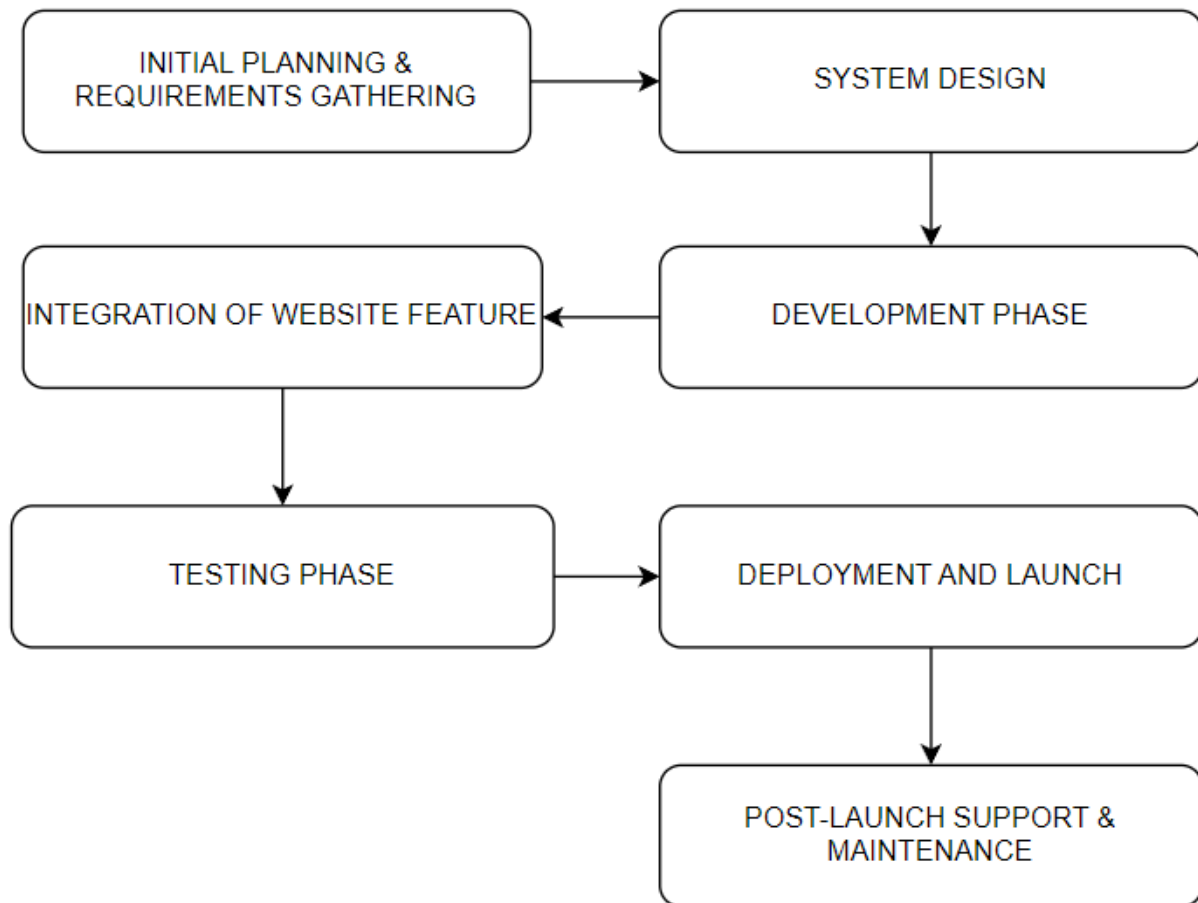


Figure 3.1 Project Development

Figure 3.1 shows the project development for the Equalizer Builder Technologies Corporation Online Web Application. This figure shows the step-by-step process to develop the system. From initial planning and requirements gathering, followed by the system design, then to the development phase, then integration of website features and the testing phase in which we will have the user's feedback and make sure it has no bugs and runs smoothly and accurately. After the development of the project, we will deploy

the program and launch the web application. And to the last part monitor the website, address feedback, and implement updates for stable and well-maintained websites.

PROJECT DESIGN

A management information system with features like email verification, two-factor authentication, role-based access control (RBAC), and audit trails is created by utilizing modern technologies. HTML, CSS, Bootstrap, and JavaScript are used in the front end to produce an engaging and dynamic user interface. PHP, MySQL, and JavaScript are used in the backend implementation to provide a scalable and effective application programming interface.

EXISTING WORKFLOW OF EBTC

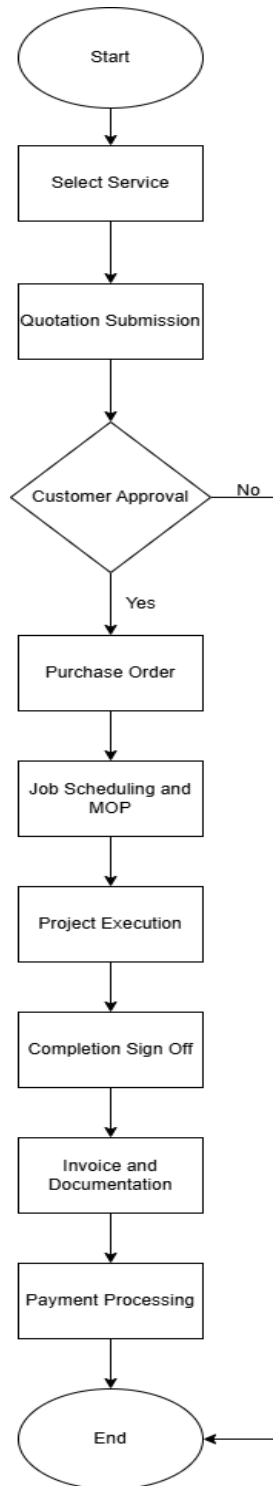


Figure 3.2 Current setup of availing the services they offer

Figure 3.2 The flowchart shows the current setup of availing the services they offer. It starts with the customer choosing a service and submitting their requirements. After that, a quotation is prepared and sent to the customer for approval. If the customer agrees and provides a purchase order, the project moves into the planning phase, where the tasks are scheduled, and a Method of Procedure (MOP) is created to guide the process. Next is the development phase, where the actual work is done, and the project is monitored to make sure it stays on track and meets quality standards. Once everything is finished, the customer gives their sign-off to confirm the project is complete and meets their expectations. The final steps include preparing invoices and documentation, processing the payment, and officially ending the process. If any issues arise, the workflow allows for adjustments before the project is fully completed. This approach ensures that the project is well-organized, runs smoothly, and satisfies the customer's needs.

DATA FLOW DIAGRAM

The project management applied for Equalizer Builders and Technologies Corporation (EBTC) is specifically aimed at achieving and satisfying clients from the beginning until the quotation submission to the customer approval to the issuance of a purchase order with a detailed job schedule and the actual work done following the Method of Procedure (MOP). After the project is over, a Client and Contractor sign-off sheet is used to show a Mutually Assented/signed agreement in regard to the above-

mentioned results with the Client before the Contractor drafts the Bills and other necessary documents which are then submitted to the customer's procurement department. The last stage is payment processing upon the check and confirmation of all the documents related to the given project, so, the last stage of the project lifecycle. The use of the project life cycle structure outlined here aids in the proper defragmentation of work, traceability, and final accountability during the project implementation process.

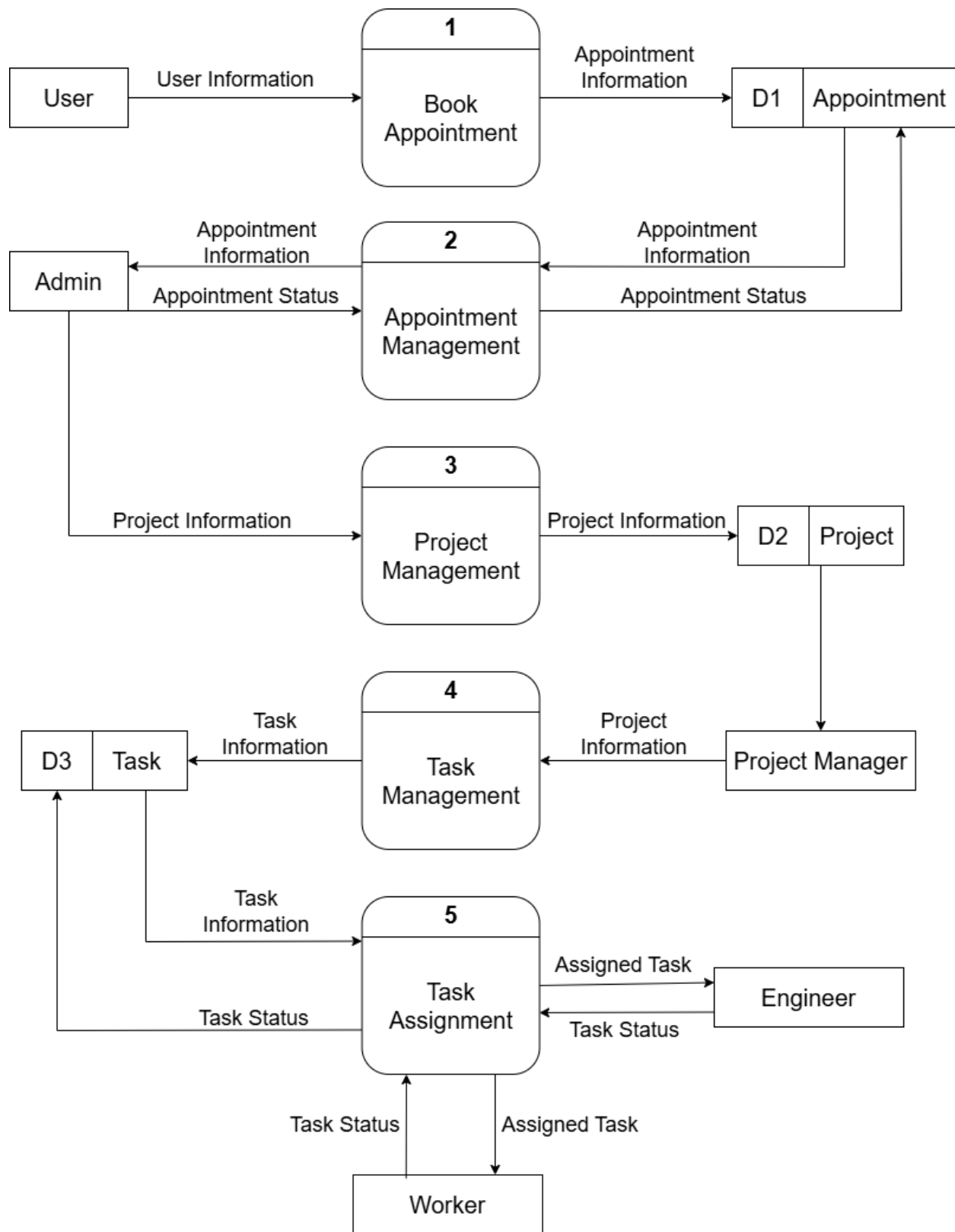


Figure 3.3 Data Flow Diagram of Web-Based Project Management System for EBTC

Figure 3.3 shows the process when the user books an appointment, the booking details are stored in the appointment database. The admin responsible for appointment management is notified and confirms the booking. The user is then informed about the status of their appointment. During the appointment meeting, the project proceeds once the user agrees to the terms and signs the contract. The admin then forwards the project details to the project manager, who oversees the project, divides it into tasks, and assigns these to engineers and workers. The assigned personnel are required to update the status of their tasks or the overall project daily. Once the project is completed, the user is notified, including information about the project's completion and warranty terms.

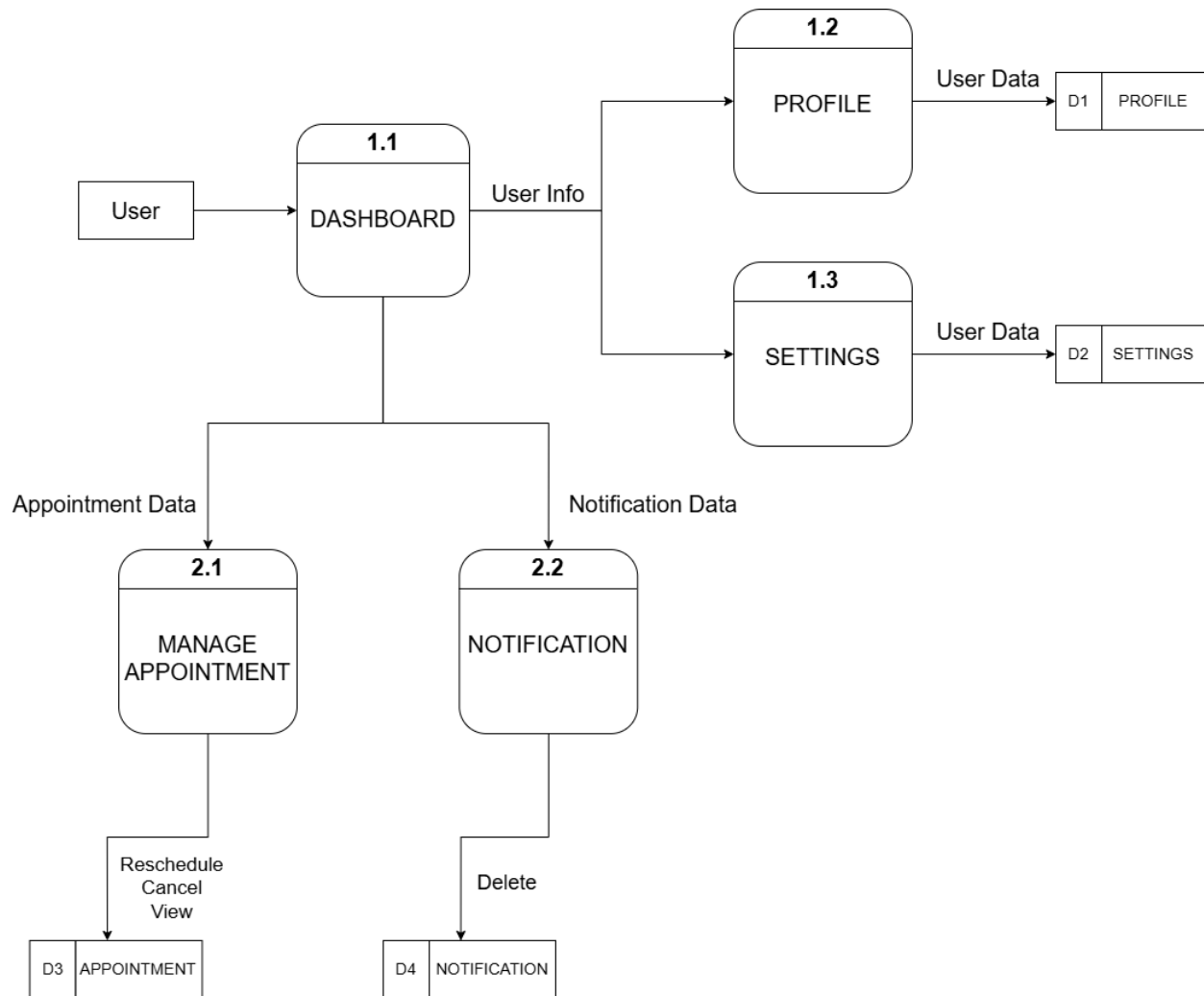


Figure 3.4 Child Diagram for Process 1 (User)

Figure 3.4 illustrates the dataflow for users. When a user logs into their account, they are redirected to the user dashboard, which features four tabs: Appointment, Notification, Profile, and Settings. In the Appointment tab, users can manage their appointments by rescheduling, cancelling, or viewing them, and they can also book new appointments. The Notification tab displays updates received throughout the appointment or project process. The Profile tab allows users to edit their account details, while the Settings tab provides options to change their password and update their 4-digit PIN code.

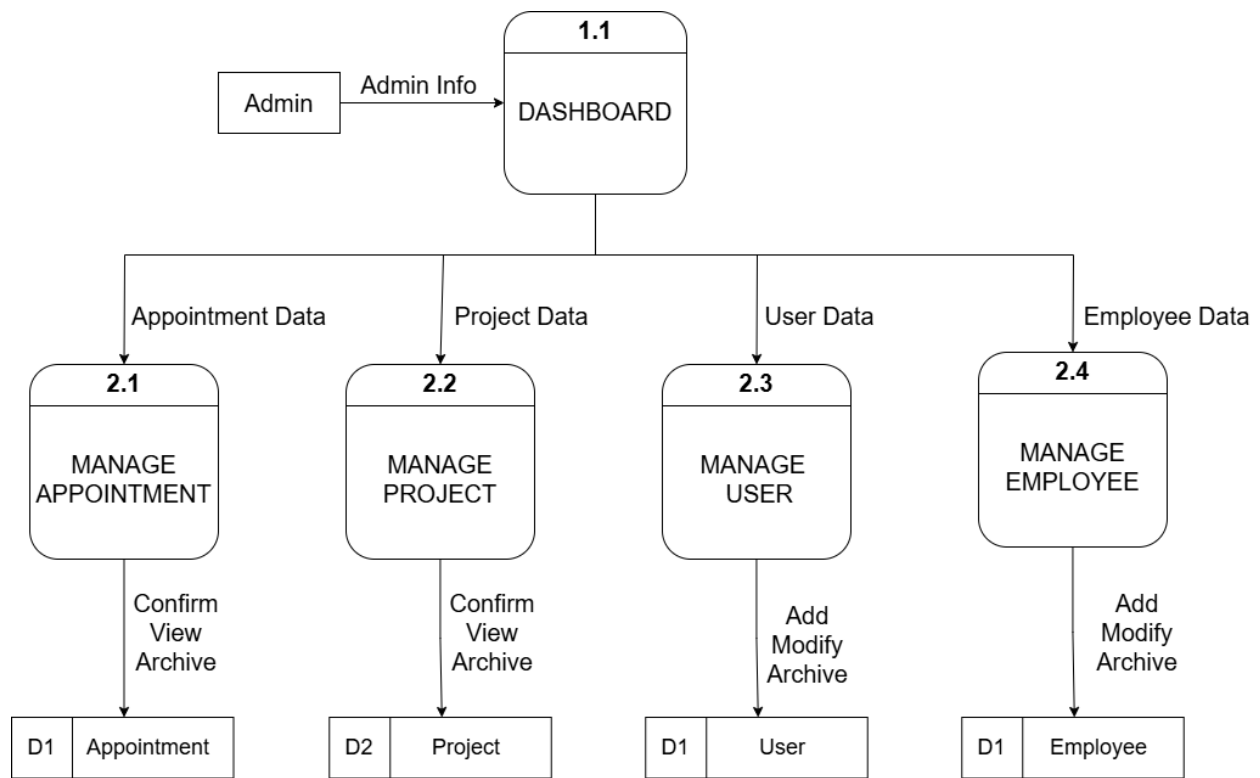


Figure 3.5 Child Diagram for Process 2 (Administrator)

Figure 3.5 represents the process for admin within an organization. When the admin logs into their account, they are redirected to the admin dashboard, which contains six tabs: Appointment, Project, User, Employee, Notification, and Settings. In the Appointment tab, the admin can manage all user appointments, including confirming, archiving, or viewing them. The Project tab allows the admin to assign projects confirmed during appointments, serving as the basis for the Project Manager's tasks. In the User tab, the admin can manage all registered user accounts by adding, removing, or viewing them. Similarly, the Employee tab lets the admin manage employee accounts, with options to create or remove them. The Notification and Settings tabs function the same as in the user dashboard, handling notifications and account settings.

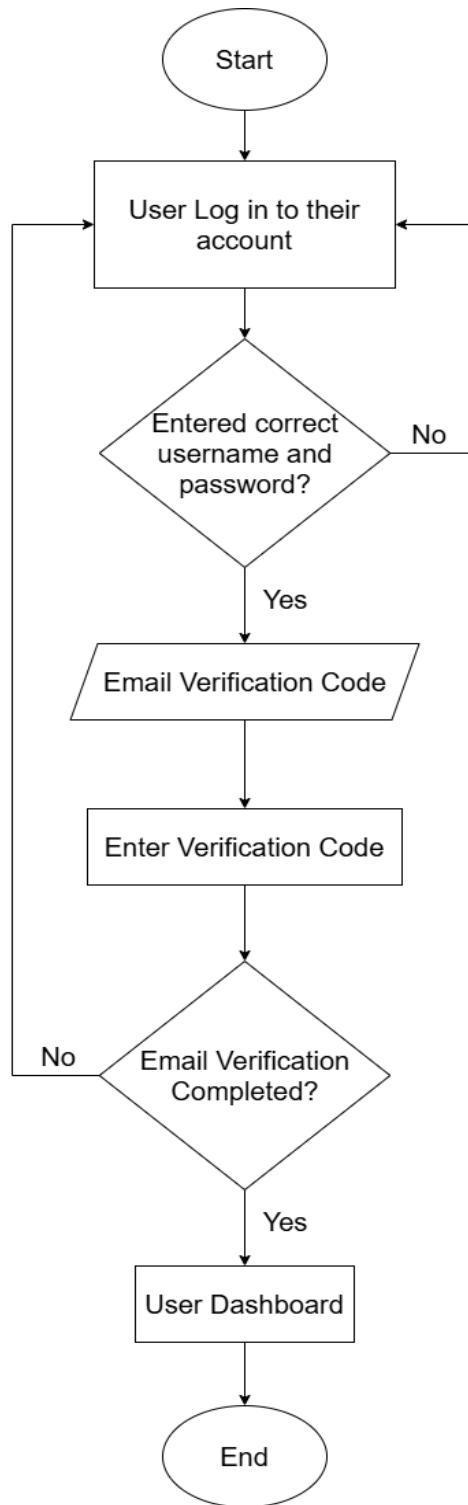


Figure 3.6 User Login Flow Chart

Figure 3.6 illustrates the account login and verification process designed to ensure secure access to the system. This process involves multiple steps to verify the user's identity and protect their account from unauthorized access. When a user logs into their account, they must verify their identity using a verification code sent to their registered email. First, the user enters their username and password. A verification code is then sent to their email, which they must input correctly. If the code is incorrect, the login attempt fails. If the code is correct, the user is successfully redirected to their dashboard.

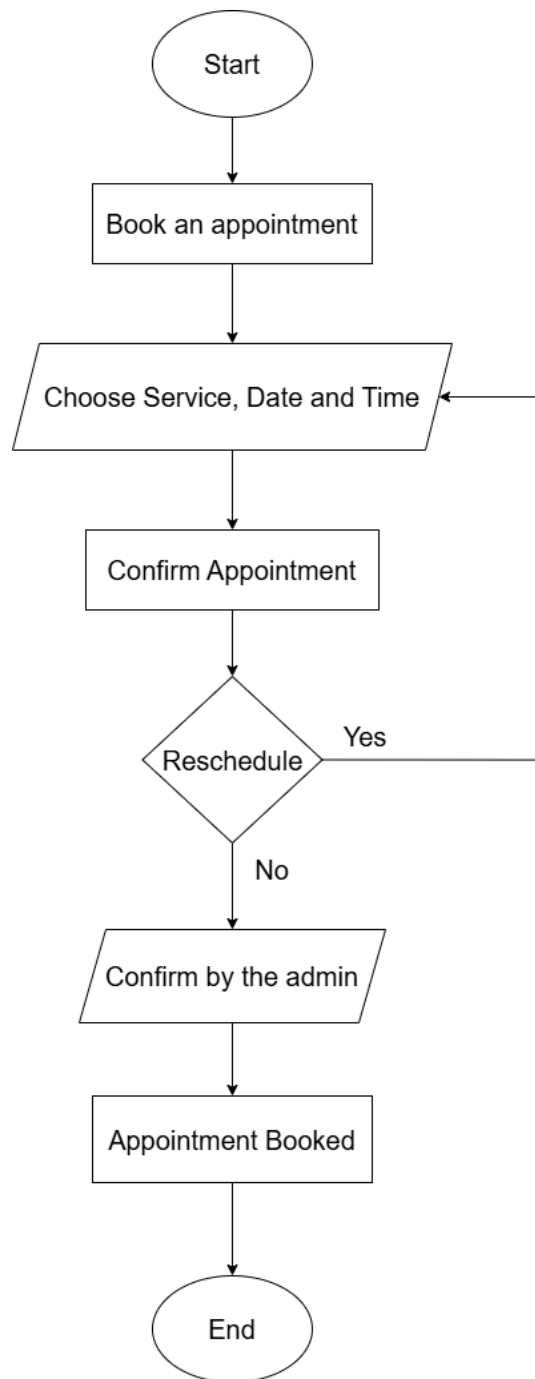


Figure 3.7 Booking Appointment Flowchart

Figure 3.7 illustrates the process users follow to book an appointment efficiently. Before booking, users must log in to their accounts or create one if they are new. Once logged in, they can proceed to book an appointment by selecting the required service, choosing a date and time, and submitting the request. Users also have the option to reschedule or cancel their appointment if needed. After booking, they must wait for the admin's confirmation. Once confirmed, the appointment is finalized, and the user can visit the EBTC office for a face-to-face meeting and discussion.

OPERATIONS PROCEDURE

Component / Phase	Procedures to be Conducted
System Requirements	<ul style="list-style-type: none">• Identify hardware and software requirements for the system (e.g., servers, workstations, internet connectivity, etc.).• Determine the minimum and recommended configurations for running the system.• Gather stakeholder feedback to ensure all user needs are met.• Prepare a detailed document listing the required technologies, frameworks, and tools.

Project Scheduling	<ul style="list-style-type: none"> • Define project milestones (e.g., requirements gathering, system design, testing, deployment). • Assign tasks and responsibilities to team members. • Create a Gantt chart or timeline to visualize project progress.
Development Tools and Preparation	<ul style="list-style-type: none"> • Select appropriate development tools, such as IDEs, version control systems (e.g., Git), and collaboration platforms. • Install and configure tools required for front-end and back-end development. • Ensure team members are familiar with selected tools. • Set up a shared repository for version control and team collaboration.
Software Tools Installation	<ul style="list-style-type: none"> • Install required software tools, such as PHP, Tailwind CSS, Javascript and MYSQL • Configure the development environment to match production requirements. • Verify compatibility of all installed tools and resolve any conflicts.

System Designing	<ul style="list-style-type: none"> • Create wireframes and prototypes for the user interface. • Design system architecture, including client-server relationships, APIs, and integrations. • Define workflows for all user roles (tenants, landlords, maintenance staff, admins).
Database Designing	<ul style="list-style-type: none"> • Identify entities and relationships • Create an Entity-Relationship Diagram (ERD)
Development	<ul style="list-style-type: none"> • Develop responsive and interactive user interfaces using HTML, Tailwind CSS, JavaScript, ensuring a seamless user experience across devices. • Build server-side functionalities with PHP, and handle database operations, ensuring smooth front-end and back-end integration. • Integrate security measures like MFA, role-based access control, input sanitization, password hashing, and HTTPS encryption. • Regularly review and align development with original design specifications, ensuring consistency in the user experience and adhering to coding standards.
Testing and Evaluation	<ul style="list-style-type: none"> • Conduct unit, integration, and system testing, • including User Acceptance Testing (UAT), and evaluate the system's quality using the ISO 25019

	standard for software quality, ensuring optimal functionality, performance, and user satisfaction.
Deployment	<ul style="list-style-type: none"> • Set up the production environment on a cloud hosting platform (e.g Hostinger). • Deploy the website using cloud hosting services, ensuring scalability and availability.

Table 3.1 Operation's Procedure

Figure 3.3 outlines the steps involved in developing an Online Web Application. The process begins with project scheduling and defining the system requirements. During the development phase, both the front end and back end are built, along with implementing security features and adhering to design standards. The system is then tested to ensure it meets ISO 25019 quality standards. Afterward, the application is deployed on cloud hosting to ensure scalability. Post-deployment, the system is monitored to assess user satisfaction and overall performance.

TESTING PROCEDURE

Component/Phase	Procedure Conducted
Functionality Testing	<ul style="list-style-type: none"> • Click the verification link sent from the user's email if it verifies the user's email.

	<ul style="list-style-type: none"> • Click on navigation links and check if it routes to the right page. • Click on any modal buttons and checks if a modal popups. • Input invalid format on any form, then submit the form if the check request proceeds. • Input any text in the search bar, then check if it retrieves the correct text. • Test if the scheduled appointment information is correctly displayed in the user's profile.
Integration Testing	<ul style="list-style-type: none"> • Input data on a form and check the database to see if the data has been added. • Manually input data into the database, load the page and check if the data is rendered in the user interface.
Security Testing	<ul style="list-style-type: none"> • Check if the password is hashed • Test if the sensitive information is encrypted in the database. • Login as a user and then check if it can access other roles endpoint to check whether the system authorization works.
Deployment Testing	<ul style="list-style-type: none"> • Deploy the system on a local network and access it on various devices within the network to check if the site is loading and working correctly.

Table 3.2 Testing Procedure

The testing process involves several phases to ensure the system works as expected. First, it verifies that all features function properly, including user actions, data input, and display elements. Next, the integration of various system components is tested to ensure data is handled correctly across the platform. Security is also a priority, with tests focusing on protecting sensitive information and ensuring proper access controls are in place. Finally, the system is tested in a deployment environment to confirm it operates smoothly across different devices and networks.

EVALUATION PROCEDURE

To investigate on the compliance of the web-based application that has been developed, the researchers engaged an evaluation study with a view of evaluating the compliance of the application against the ISO 25019 software quality standard in order to know the extent with which it meets the set quality as well as to identify other areas in which the application can be improved. The test employed a set of questions incorporating test cases and a Likert Scale was used to quantify the answers. Respondents were asked to rate the system's quality across various criteria, with the following scale of response options:

5 = Strongly Agree

4 = Agree

3 = Neutral

2 = Disagree

1 = Strongly Disagree

Evaluation's Procedure

RATING	SCALE	VERBAL INTERPRETATION
5	4.21 - 5.00	Strongly Agree (SA)
4	3.41 - 4.20	Agree (A)
3	2.61 - 3.40	Neutral (N)
2	1.81 - 2.60	Disagree (D)
1	1.00 - 1.80	Strongly Disagree (SD)

Presents the five-point Likert scale, ranging from strongly agree to strongly disagree, with categories such as agree, neutral, disagree, and strongly disagree. These ratings will serve as the basis for evaluating the system's overall performance and its acceptance.