ADEPT AND YIELD OPTIMIZING SYSTEM: WEB-BASED-APP FOR

APPLIANCE REPAIR SERVICES (AYOS)

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ABSTRACT

One of the major issues commonly encountered in households is the occurrence of broken or malfunctioning appliances, which can lead to more complications, inconvenience, and safety hazards. To address this problem, the researchers developed a web application that answers appliance-related issues and provides access to qualified technicians who can help ensure the proper functioning of the appliances. This study, "Adept and Yield Optimizing System: Web-Based App for Appliance Repair Services (Ayos)," aimed to create a web application that allows appliance maintenance to be more efficient, easy to use, and accessible for everyone by providing a smooth and user-friendly experience. Through this web application, it can also be a platform for creating employment opportunities for professional technicians. The website increases the number of efficient repair services for customers and minimizes unemployment in the Philippines. The customers are advantaged by the convenience of sending detailed descriptions of the issues with their appliances. Technicians can provide various services based on the level of urgency after reading through the submissions. The system facilitates effective communication, accelerates service delivery, and offers a more tailored experience through such an efficient process. The ISO 25010 evaluation framework was applied with a special emphasis placed on the capacity to evaluate the reliability of the system. Based on the responses from thirty (30) respondents, the web app gained a mean score of 3.56, corresponding to "Highly Acceptable." The results show that the system is highly effective, with features that deliver the expected outcomes in different scenarios. Within the parameters provided, the system also demonstrated stable operation reliability.

Chapter 1
THE PROBLEM AND ITS SETTINGS

Introduction

The electronics industry in the Philippines is experiencing rapid growth, with consumers increasingly purchasing advanced gadgets and home appliances, e.g., smart fridges, robot vacuums, and air fryers. However, while demand for these products continues to rise, the repair and maintenance sector has not kept pace. This imbalance has led to significant challenges in accessing reliable and affordable technical services when the electronic devices start to malfunction. Consequently, consumers often face difficulties finding qualified repair professionals, highlighting a critical gap in the industry's support infrastructure.

Hence, this study sought a solution to address the emerging needs within the electronics repair store: to develop a digital platform that leverages the Technical Education and Skills Development Authority (TESDA)'s certification database to validate technician credentials and specializations. The framework thus facilitates a meritocratic employment system, wherein service opportunities are awarded based on verified qualifications instead of nepotism or arbitrary referrals.

Moreover, the system also ensures compliance with relevant consumer protection laws in the Philippines, thus providing its users with accountability and credibility. The system simplifies the registration process for professionals so TESDA-certified technicians can establish an online presence, access freelance employment opportunities, and earn a sustainable livelihood. In addition, the system also provides consumers with a credible and affordable appliance repair option. The aim of this project was to leverage

information and communication technology (ICT) to create a service-based digital infrastructure for promoting employment, enhancing access to services, and supporting sustainability. The features include service discovery, scheduling, open profiles for the technicians, and user feedback mechanisms. The system addresses current gaps in appliance repair services and demonstrates the applicability of programming and system development skills in servicing the community's needs.

Background of the Study

Technological advancements have become a major part of contemporary living, not just in the Philippines, but all over the world; the use of digital devices and electronic devices has become a key component of residential consumables. In the Philippines, there has been a growth in the demand for consumer electronics and home appliances based on the factors of urbanization, increases in disposable income, and reliance on digital technologies.

As these appliances become more complex and ubiquitous, the need for competent repair and maintenance services has increased, but the current service provision cannot address the demand, which has led to operational inefficiencies, extended repair times, and consumer dissatisfaction. Therefore, access to trustworthy, reliable, professionally-skilled (repair service provider) became an urgent issue that requires creative thinking on how to solve.

The Philippine Statistics Authority (2021) states that the preliminary results of the 2020 Annual Survey of Philippine Business and Industry (ASPBI) identified the production of electronic components as a significant industry. It made the largest

contributions to employment, revenue, and expenditures, exemplifying its central economic contribution and strong inter-linkages with other industries. Growth aside, the industry continues to experience pressures on non-wage costs, such as wages not keeping up with revenue growth, exemplifying continued cost pressures and thin margin growth. These trends exemplify the necessity for creating workforce flexibility through multidimensional training programs, such as the combination of technical repair skills and supply chain skills.

To balance the existing imbalances in labor and service supply, institutions such as the Technical Education and Skills Development Authority (TESDA) and the Technological University of the Philippines (TUP Manila) have encouraged technical-vocational education intended to supply the labor market with skilled, hands-on professionals who would be capable of addressing the needs of the growing appliance repair industry. Expanding on these government initiatives, the present study describes the creation of the Adept and Yield Optimizing System (AYOS)—an internet-based platform designed with utmost care to match clients with TESDA-certified technicians for appliance repair. This platform leverages TESDA's official registry to verify credentials, provides transparent pricing arrangements, and enables job matching between consumers and service providers. Through this means, AYOS greatly contributes to the establishment of job creation among technical specialists while simultaneously increasing consumer confidence and convenience in the appliance repair service process.

The core focus area of the platform is urban household appliances, i.e., consumer electronics such as laptops and computers. By promoting resource-conserving repairing services, the project aims to reduce electronic waste and extend the operational life of

appliances, thereby reducing economic and environmental issues in the community.

Objectives of the Study

The main objective of the proponents is to develop a web application that connects individuals in need of appliance and gadget repairs with skilled service professionals in their area. The web application aimed to bridge the gap between repair needs and services, addressing key challenges in the appliance repair industry. By enabling convenient discovery, fair pricing, transparency, and flexible scheduling, the proponents sought to increase satisfaction for appliance owners while also improving income opportunities for qualified repair experts, specifically those graduates or completers of TESDA programs. The intended outcome is a community-driven solution that promotes hassle-free repairs and sustainable reuse of appliances, making it easier for busy households to fix broken devices.

Specific Objectives

1. Design and develop the system with the following features/characteristics:

    a. The admin dashboard facilitates key functionalities, including the TESDA Skills Demand Report, transaction monitoring, technician skill verification, and assessment of technician proficiency.

    b. Payment Integration: Secure in-app payments via integrated gateways, Invoice generation, and payment receipts. Technicians showcase expertise, credentials, and reviews.

    c. TESDA Integrations: Technician Skills and Qualifications validated from the TESDA Database, enables search/filter by verified competencies.

   d. Inventory Management: Technicians manage spare parts inventory, and purchase parts integrated with finances.

2. Create the system using the following software development tools:

  a. Frontend: React

  b. Backend: NodeJS, JavaScript, Express.js

  c. Database: MongoDB Cloud

  d. Third-party APIs: Payment gateway (e.g., Stripe)

  e. Development Tools: Git (e), Integrated Development Environment (IDE), Visual Studio Code

3. Test and improve the system in terms of Capability

4. Determine the level of Reliability of the developed system using the ISO 25010 system quality standards.

Scope and Limitations of the Study

  The study's primary purpose was to create and develop a stable web application explicitly tailored to satisfy the needs of appliance maintenance specialists and the customers requiring repair services. This application focused on creating a seamless bond between the customers and authorized maintenance specialists and providing a simple way to find and hire repair specialists.

  The application supports appliance owner and technician user registration and sign-up of profiles. The profiles hold limited information, such as location, contact numbers, and communication preferences. The application was structured to enable effective user interaction based on unique service requirements.

  Customers can request repairs by submitting detailed descriptions of a problem with

an appliance and supporting pictures. The requests are geographically and by appliance type organized by the system, allowing the system to find available technicians in the vicinity. Hence, it is easy to access and reduces response time.

This system features inbuilt client-chatting mechanics, enabling a technician and client to establish real-time communication. This will allow technicians and clients to share all fundamental details with each other by discussing specificities pertaining to the job and confirming their need for services. To some extent, such a feature increases transparency and communication in the total process.

The system has a dynamic scheduling module where technicians and clients mutually agree on a suitable appointment time. Therefore, appointments can be flexible regarding the time to service. In such circumstances, satisfaction increases.

Technician profiles consist of skills, qualifications, and TESDA-certified experience. Additionally, the ability to carry user-generated reviews on the platform enables appliance owners to base their decisions on previous performance and service quality.

Service acceptance occurs after both parties have agreed on the appointment schedule. The client can assess the service and give feedback once the work is done. This process keeps the parties on their toes and ensures high standards of service excellence.

User data is stored securely, and precautions are in place to protect it from unauthorized access, intrusions, or data breaches. Data is stored in the system as long as the user account remains active, and it is erased from existence when the account is deactivated. The system also complied with the Data Privacy Act of 2012, ensuring that all personal information remains confidential and out of reach of unauthorized persons.

An integrated payment gateway facilitates smooth payments on the platform. Users can trigger payments, view transaction history, and download electronic receipts, thus maintaining transparency and financial security.

A one-month warranty is offered, following a service. In this period, the technicians can improve their understanding of the serviced appliance, thus increasing service quality and customer satisfaction.

Limitations:

Since the objective of the system was to provide reliable and accessible services, some limitations were observed. First, although the system was implemented to minimize service interruption to an optimum, the platform cannot guarantee constant system uptime. Some downtimes were incurred due to server maintenance, technical issues, or unforeseen circumstances.

In an effort to maintain the quality of work, the technicians will handle a maximum of two or three repair jobs per day. This way, the technicians will not get exhausted, and each job will receive the required time and attention. Moreover, service calls will be made sequentially because the technicians need to serve each customer separately and not all at once.

The website cannot be held responsible for managing or dictating the prices or availability of appliance spare parts that could affect the price or viability of certain repair services. Users should consider such outside influences when using services provided through the website.

Technicians work autonomously, leading to differences in competence and

experience. While the system provides profiles and reviews written by users to support technician selection, clients are expected to use due diligence in the selection of service providers.

Cash on delivery (COD) as a substitute can be an issue, with situations where clients cannot pay upon service delivery, which would therefore cause delays or instances of non-payment. Secondly, handling cash exposes one to security issues and might discourage clients who prefer secure, electronic payment methods.

The website only offers communication between the clients and expert repair professionals. It does not offer a warranty or after-sales service for appliances. Any warranty claim or subsequent issue must be arranged directly between the client and the technician. Lastly, the original deployment of the platform will be limited to defined geographic locations. Individuals residing in areas outside of the original rollout will have limited access to services, with expansion to come later, subject to the system's performance and demand.

Significance of the Study

The study aimed to develop web-based applications that, in turn, would offer benefits to various stakeholders who are availing of services in appliance repair in the Philippines.

For several end-users and appliance owners, this alternative approach provides very convenient and speedy repair services through mobile phones. The instant bridge links end-users to certified technicians, so delaying and idle machines are prevented; thereby, usefulness and functionality are restored to home appliances. In addition, the use of open

pricing models makes repair affordable and provides an alternative, low-cost option for replacement with appliances.

The platform trickles down to the professional technician, most especially TESDA graduates, to provide these services to a wider potential customer by showing their credentials, certificates, and track record of service. Hence, the credibility of technicians is established, and more work opportunities are possible. Including the system in TESDA's registry will authenticate their qualifications, thus allowing graduates to build sustainable livelihoods.

At the institutional level, TESDA may harness built-in analytics from the platform to gauge service trends, predict competence needs, and fine-tune training programs as necessary. This stands well with the aspirations of the institution to optimize graduate employability and broaden industry partnerships. To enrich this digital infrastructure, a benefit can also be derived from TESDA in terms of achieving its overall target around digital transformation and modernization.

From a broad-ranging social perspective, this project champions a sustainability principle - repair and reuse of appliances rather than disposal. It lessens waste and endorses ethical consumption. The site, meanwhile, promotes accountability in appliance repair through novel discovery and open community interaction. This project's innovative digital contribution extends to appliance users, enables technical experts, builds institutional capacities, and brings in environmental sustainability. One of the biggest technology-driven and integrated strategies salutes the study's importance and utility not just on an academic basis but also on a practical basis.

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Chapter 2

CONCEPTUAL FRAMEWORK

Review of Related Literature

The chapter summarizes the literature and research supporting the project, explains the study's conceptual model, and defines important terms. It highlights how the relationships between different sources identify the research gap the study aims to fill.

TECH-VOC

The Tech-Voc Program seeks to empower various groups and enhance employment prospects for underemployed and jobless persons and sectors by fostering skill development and essential financial literacy. Paulino R., Malayas, A. (2022). The study examines the application of PollEv, particularly within a public secondary school context, as a web-based system and learning management tool for Technical-Vocational programs.

Tech-Voc is about combining theory with practical training to enable students to learn the skills they require for a range of jobs across various industries. These short courses usually take 2 months to a year, giving them a good foundation to launch their career. Baffour-Awuah (2018). The research among the customers in the automotive electrical maintenance service sector was in Ghana, stating that the demographic factors in addition to service quality factors, can affect customer satisfaction. An analysis of 240 respondents from Accra, Cape Coast, and Takoradi stated that overall service quality improvement is likely to enhance customer satisfaction, with Tangibles, Responsiveness, Assurance, and Empathy playing an important role. Recommendations indicate that workshops are

sensitive to these dimensions and demographic factors in order to remain competitive. The limitations of the study, though, necessitate further research to validate and enhance the SERVPERF model and its implications.

It offers a competitive curriculum that blends Core Courses and specialized practical courses that align with TESDA's competency-based assessment. Upon completion of the course, learners may take the TESDA National Certification Assessments. Nuque, Agasen, and Cabardo (2019). The abstract summarizes a study to determine the competence of the Bread and Pastry Production NC II passers in instructing tourism-related topics and their effect on the learners' productivity in a technical-vocational school in Caloocan City. Conducting an experimental research design using 58 respondents, the study employed survey questionnaires and descriptive and inferential statistical analysis.

Ramos (2021). The research presents an automated and zero-maintenance Ebb and Flow Hydroponics System and evaluates its quality based on ISO 25010 with the views of IT professionals and end-users. IT professionals and end-users verified the functional suitability, usability, and portability of the system and rated the overall assessment as excellent by IT professionals, very good for functional suitability, and excellent for usability and portability by end-users.

In 2015, Iddrisu, Nooni, Fianko, and Mensah published a paper. The SERQUAL model measures dimensions of service quality, customer satisfaction, and customer loyalty. Following the implementation of the Mobile Number Portability (MNP) system, this study focused on cellular businesses in Ghana and how service quality influences customer

loyalty. Researchers examined the relationship between customer loyalty and the SERVQUAL model's five critical service quality factors: tangibles, responsiveness, reliability, assurance, and empathy. Satisfaction served as a mediator in this relationship.

According to Mack (2024), his study examines how limited financing affects TVET administration and efficiency in Trinidad and Tobago. TVET and human capital development are crucial to the country's economic and social advancement. The research interviewed ten educational professionals, including four postsecondary TVET leaders and the head of the national TVET regulating body. Using thematic analysis, the study highlighted three financial challenges: administration, human capital development, and organizational efficiency. Participants noted that funding constraints severely impair TVET institutions' teaching, management, and long-term development.

TESDA

According to Tandoc, Argiñoso, Carungay, and Tafalla (2023), technical training comes from the Filipino Technical Education and Skills Development Authority (TESDA). They offer training fit for a career. Found in the "Technical Education and Skills Development Act of 1994," Republic Act 7796, this study suggests a smartphone app with a location-based listing of nearby handyperson businesses. According to the mixed methods research of 414 randomly selected Metro Manila homes, plumbing, electrical, and carpentry services are most in demand. Most handypersons prefer texting and calling; they are usually found via word-of-mouth. Paying daily beat as employed. Emphasizing the need for credentialing them, statistical tests addressed problems with identifying, communicating, and paying handypersons.

Godoy Jr. (2021). TESDA is crucial in providing technical vocational education and training programs in the Philippines. The study aims to review and gather information on the different mobile game applications and the possibility of being a supplementary tool for learning to enhance and empower the e-learning aspect of the Technical Education and Skills Development Authority. It is reviewed to help in the development of the eLearning department of TESDA. The study aims to help reorganize the E-learning program of TESDA by using Game-Based Learning.

Based on the study by Dumaua-Cabauatan, Calizo, Quimba, and Pacio (2018), improving the quality of living in a developing nation such as the Philippines depends on education and training, resulting in employment possibilities. TVET, or technical and vocational education and training, enables individuals to acquire useful skills that can lead to employment, better income, and a means out of poverty.

Orbeta and Corpuz (2021) studied under the Philippine Business for Education's YouthWorks PH initiative. Based on statistics and stakeholder interviews, the study concluded that public TVET providers graduate more students than private ones. Most tourism graduates come from community or institution-based programs (hotel and restaurant). The demand for national certificates is concentrated in a few places. The study found minimal demand for construction-related training, financial constraints, and trainer and content quality concerns. Industry respondents suggested standardizing prefabricated construction and nursing aid abilities.

According to Quimba and Calizo (2018), the report starts by examining the key elements of the digital economy in the Philippines to get a clearer picture of its current

state. It looks at the physical infrastructure that supports data transmission and the devices, software, and functionalities that make it all work. To illustrate the benefits of the digital economy, the report highlights specific case studies, such as the TESDA online portal for e-education and konek2CARD for e-finance. These examples show how infrastructure improvements support the growth of the digital economy.

Budhrani and Espiritu's (2013) paper outlines the online education model and initial results of the Technical Education and Skills Development Authority (TESDA) Online Program in the Philippines. Launched in March 2012, the program aimed to reach a wider audience and reduce the costs incurred by trainees. TESDA offers four online courses, with over 40,000 registered users, including 3,000 from at least 10 countries outside the Philippines.

Price and Caboverde (2017) emphasize that the IT BPM sector is one of the Philippines' biggest engines of economic growth and job creation, with the potential to uplift more lives across the country. A vital support system for this industry is technical vocational education and training (TVET), which TESDA and other training institutions manage. TVET programs help workers build the skills they need or update the ones they already have to succeed in the fast-paced IT BPM world.

On-demand

Yadav, Tiwari, Tiwari, and Singh (2023) conducted a study of the on-demand home services industry and put forth recommendations. Furthermore, the study highlighted that what is missing in present systems is a user-friendly element that includes real-time monitoring, auto-pay features, and personalized service recommendations. In addition, they emphasize the possible role of AI and machine learning in extendable competition

among providers. Taylor's work (2010) scrutinizes the interaction between pricing, agent compensation, and marketing in on-demand service systems. The study states that merchant-priced delay-in-service is most sensitive to optimal pricing when customer valuation uncertainty is at a middle level. In contrast, high opportunity cost uncertainty leads to low agent compensation because the demand-to-service-waiting time ratio is more sensitive to delay. These results illustrate the relationship between consumers, a market price system, agents' discretionary decision-making, and a business control system.

Oladimeji et al. (2024) report on the role of the Internet of Things (IoT) in communicating data and connecting smart devices, where they examined the impact of the IoT across multiple sectors. This study examines how IoT impacts traffic management, logistics, and transportation safety. Also reported are issues of network scale, device interoperability, and data privacy, which the study, in turn, puts forth a model that includes cloud, fog, and edge computing.

Güsser-Fachbach, Lechner, Ramos, and Reimann (2023) analyze the repair service accessibility barriers in the region of Styria in Austria. The lack of awareness and limited store hours coupled with long waiting periods are particularly inconvenient for users. In the study, the authors put forth the idea that local governments, businesses, and civic organizations take the initiative to build centralized repair centers where they conduct proactive marketing to foster demand and support circular economies. Ahmed, Talukder, Talukdar, Ahmed, and Rifat (n.d.) discuss the innovative ways in which services such as Sheba.xyz are transforming the service sector in Bangladesh. Sheba.xyz promotes services of verified professionals and technologists, making services available on demand. Sheba.xyz creates value by bridging the relationship between client and servant. The study

explores the challenges and possibilities for Sheba.xyz, underlining the economic potential of digital service systems in developing economies.

Customer support

Felix and Rembulan's (2023) study aims to identify the primary factors affecting consumer experience, loyalty, and commitment in the Indonesian e-commerce market. Therefore, it will provide helpful implementation ideas for companies to keep in the development of an e-commerce platform as a roadmap for their next research.

Patil and Rane (2023) comprehensively analyzed the degree to which Zomato and Swiggy transformed the restaurant business, focusing specifically on Navi Mumbai. Individuals seldom recall an era when they could not access a billion restaurant evaluations on their iPhones. Menus, reviews, raves, and complaints from individuals are all conveniently located. They shifted into full detective mode, combining comprehensive searches of genuine evaluations available on Zomato with data from polling. It has been discovered that the content that individuals publish has a positive or negative impact on the decisions of consumers regarding where to allocate their funds. This study primarily underscores the extent to which consumer decisions and, to be frank, the survival of restaurants is contingent upon those internet opinions.

Braggaar, Verhagen, Martin, and Liebrecht (2003) highlighted the open-ended questions that suggested a potential correlation between the nature of client inquiries and the execution of repair solutions. All entities have adopted chatbot systems for customer service purposes. These bots continue to commit faults. According to Costello and LoDolce (2022) and Følstad et al. (2021), these systems persistently face the same challenges. The

objective of the project is to determine how to improve the quality of these conversational bots. This article aims to identify problematic regions that may cause customers to exit the chat window abruptly and to propose effective fixes.

Lechner, Kraßnig, and Güsser-Fachbach (2024) conducted the subsequent actions. They reviewed the literature, consulted several professionals, and ultimately assembled a list of 107 qualities potentially significant for repair services. Not all of the elements hold substantial significance in reality. Over 600 individuals were questioned to ascertain their primary concerns regarding repairs. The paramount aspects are trust, expenses, transparent information, and the ability to engage in authentic human communication. The study effectively enables repair firms to acquire clients. Furthermore, it furnishes politicians with compelling arguments to advocate for the cessation of landfill disposal.

Rane, Achari, and Choudhary (2023) investigate Ghana's mobile telecoms sector and how the degree of competition affects market dynamics and customer likelihood of switching providers. Two hundred volunteers had their information gathered via Google Forms questionnaires. While perceived value and switching costs clearly impacted switching intention, competitive intensity had no such effect. According to the research, companies should work on ways to make customers feel that they get more for their money and that switching costs are low, while governments should promote healthy competition among industries to improve product innovation and customer satisfaction.

Technician

Technicians play a vital role in various industries, and they are responsible for

repairing and maintaining facilities and equipment within their work environment (Christiansen, 2024). They handle routine maintenance tasks, respond to work orders, and conduct inspections to ensure operational efficiency (Christiansen, 2024). One of their key abilities is recognizing when specialized skills, such as electrical or plumbing expertise, are required for specific tasks, which helps minimize outsourcing costs (Christiansen, 2024). Similarly, general service technicians work in automotive, machinery, or home appliance industries, inspecting, maintaining, and repairing equipment (ZipRecruiter, 2022). This role demands mechanical aptitude, attention to detail, and strong customer service skills to provide effective service in diverse settings like schools, hospitals, hotels, and residential buildings. Technicians contribute significantly to maintaining operational efficiency and meeting maintenance needs through their expertise and collaboration with colleagues (Peters, 2021).

Technicians are essential to maximizing the delivery of IT services, according to Herdiansah et al., research on the Prototype Planning and Technician Job Report System (2020). The project aims to create an information system that will help clients of PT Visionet Data International, an IT outsourcing firm, with scheduling, tracking, and reporting technical work. These experts oversee vital services like daily IT help desk assistance and data center operations, guaranteeing the scalability and dependability of the computerized infrastructure that supports the commercial operations of their clients. Through the maintenance of a high quality of IT service delivery, the performance and efficiency of these professionals directly affect customer happiness and project success.

Similarly, in the study by Yu et al. (2023) on the Field Technician Scheduling Problem with Experience-Dependent Service Times, technicians are pivotal in the efficient

execution of maintenance tasks and service operations.

Web

In terms of the proposed concept of developing a web-based application to assist users in locating certified technicians to repair appliances and gadgets, it is helpful to examine web technologies as tools to facilitate that connection. Rouse (2023) defines the Web as a sector of the Internet that allows a user to travel through maps of interconnected web pages. This is similar to the intended purpose of the user finding qualified service professionals and scheduling appointments as easily and intuitively as possible. The web-based application will use web technologies like HTML or HTTP so that clients can connect with service providers and improve the user experience overall.

The application will function as a web application, as Luenendonk (2023) points out, web applications are designed for web browsers, allowing people to complete their tasks without needing to install separate software. This is relevant and structural to the proposed system because it is meant to deliver key functions, based on a customer locating a technician, understanding the price structure, and appointment availability, as a browser interface. This adds user convenience and ease of access.

Web applications are flexible and accessible to users across several devices and platforms, providing users with consistent access to the services being utilized from anywhere. This is an important aspect of the proposed web application, which aims to assist TESDA-certified technicians by providing a platform for them to present their credentials and services. The connection to TESDA's certification database promotes needed transparency and legitimacy in the system—an important aspect of web-based applications, especially because trust and satisfaction are significant considerations among users in web

applications.

Since 1994, when the Internet was first made publicly available and the World Wide Web became more broadly available in 1995, it has emerged as a major grassroots platform for deploying web applications that have become increasingly complex. Jazayeri (2007).

The World Wide Web (WWW) has recently become a powerful information exchange channel. More and more businesses are creating websites to promote their products and services. However, to fully realize the potential of this new platform, careful planning and preparation are essential.

According to Standel and Jamar (2018), technological innovations significantly impact the design of products and services. The rise of smartphones, particularly after the launch of the Android OS, has led to a massive increase in smartphone usage. Most users browse content through native mobile applications, while others use web browsers. However, both methods come with their own limitations.

Additionally, Hayes (2018), With the increasing breadth and sophistication of open-source languages, libraries, frameworks, standards, tools, and resources, Mobile Web App development is possible for a broad audience.

According to French (2011), Service Science forms the foundation for information systems and web services that follow the provider/client model. This paper introduces a methodology designed to aid in the development of web services, including websites, web applications, and e-commerce platforms.

Service

The concept of "services" has evolved significantly over time, adapting to technological integration and changes in everyday routines. Fonseca et al. (2014) discuss this evolution, highlighting the shift from classical service concepts to modern service systems. They emphasize the need to systematize and redefine services to align with emerging realities and incorporate new paradigms. In a related vein, Kaczor et al. (2013) delve into service fundamentals, drivers, and business models, elucidating the transition towards a service-dominant economy and the importance of distinguishing services from goods. They underscore the rising role of services in total employment and explore business model variations crucial to the service economy. In addition, (Indeed, n.d.) delineates the role of a service technician, outlining the diverse industries where technicians operate, such as automotive, IT, HVAC, and manufacturing. As described by Peters, (2024), service technicians are skilled workers capable of performing repairs and maintenance at customer locations, highlighting the practical applications of service concepts across industries.

By addressing this, Ogunrinde et al. (2023) provide a relevant study centered on optimizing handyperson services within Nigeria's dynamic economy, considering the changing nature of the service landscape. Nigeria's population is growing quickly; thus, it needs organized systems to deliver these basic services effectively. To tackle this issue, they suggest creating a collaborative platform for service providers, which aligns with the modern service models described by Fonseca and Pinto (2014) and Kaczor et al. (2013). By developing a digital platform using web technologies and iterative design methods, Ogunrinde et al. (2023) built a streamlined system connecting clients with handyman

service providers, improving accessibility and service quality.

In addition, Hong et al. (2020) emphasize the significance of professionalism along with excellent service quality in maintaining client engagement and the longevity of long-term relationships in the vehicle maintenance and repair service industry. This perspective aligns with broader discussions on business model modifications and service foundations highlighted by (Kaczor et al., 2013), emphasizing the importance of enhancing mechanisms of service delivery.

A shared understanding of how service paradigms are evolving underscores the increasing need for innovative ways to deliver services. In response, Ogunrinde et al. (2023) propose a collaborative digital platform to enhance handyperson services in Nigeria, targeting the issues posed by a fragmented informal sector in the face of rapid population growth. Likewise, Hong et al. (2020) emphasize the role of professionalism and service quality in building lasting customer relationships in the auto maintenance and repair industry. Together, these studies point to the importance of technology-driven solutions and strong quality assurance practices in meeting the changing demands of modern economies and improving both service accessibility and customer satisfaction.

Real-time Communication and Collaboration

Real-time collaboration has become essential for how remote teams operate. It enables people in different locations to work together simultaneously, helping them stay connected and keep projects moving forward (Kantor, 2024). Microsoft (2021) points out the versatility of these tools. When teams share documents or screens, these tools let everyone pitch in at the same time. As York (2023) points out, this kind of teamwork boosts

productivity, leads to better results, and helps team members build stronger connections.

Of course, it is not without its hurdles. Time zone differences, user-unfriendly platforms, and the risk of people feeling disengaged can all get in the way (Alex York, 2023). Still, as remote work keeps growing, collaborating smoothly in real time is becoming essential for teams to make the most of their resources and reach the best possible outcomes.

Real-time communication and collaboration are essential for optimizing field service operations and enhancing mobile workforce management. Integrated messaging and collaboration tools within field service management applications, referred to as a "single pane of glass," facilitate seamless communication between operations managers, dispatchers, technicians, and customers, leading to improved operational efficiency. According to a study by Field Squared, these integrated solutions can enhance operational efficiency by up to 30% (Percy, 2018). Empowering technicians to engage directly with customers via SMS or text within the same application enhances customer satisfaction through personalized interactions (Percy, 2018). Moreover, real-time collaboration tools help bridge knowledge gaps and improve communication among field teams, as indicated by Deloitte's survey, which reported that 80% of field service organizations experience improved employee productivity (Deloitte, 2021). As organizations embrace digital transformation and remote work, integrating real-time messaging and collaboration tools into field service management strategies becomes crucial for maintaining competitiveness and meeting evolving customer expectations.

Cloud Computing

According to Steve Ranger (2022), it transforms access to computing services over the internet, offering flexibility and economies of scale without the need for owning physical infrastructure. This technology is indispensable in everyday life and business settings, enabling remote work, omnichannel customer engagement, and leveraging innovative technologies like generative AI. The model, highlighted by Stephanie Susnjara and Ian Smalley (2024), provides on-demand access to a wide range of resources, including servers, storage, and AI-powered tools, fostering scalability and cost-effectiveness.

In cloud computing systems, priority-based job scheduling plays a vital role in improving resource management and job distribution efficiency. Saydul Akbar Murad et al. (2024) explore this in their study, which addresses reliability challenges stemming from both virtual machine software and the underlying physical infrastructure.

Mesbahi et al. (2018) discuss the issues of reliability and high availability in cloud computing environments. Their "Reference Roadmap" presents areas of concern, grouped around four basic questions—Where, Which, When, and How—to provide highly reliable and available cloud systems.

Thus, cloud computing transforms IT infrastructure, providing remote work and AI adoption with accessibility, scalability, and cost-saving. Advanced job scheduling methods such as PBFS and EG-SJF optimize cloud performance, while Mesbahi et al. (2018) prioritize reliability and availability factors critical for customer satisfaction and revenue protection in contemporary cloud services.

Related Studies

Website-Based Online Job Training Application Design Using the Unified Modeling Language

According to S. Batubara, Wahyono, and Khaliq (2022), demographic data of the community based on labor reveal that although the community is exerting much effort, there are some unemployed people in the population. This increasing trend of unemployment, if not properly controlled, may negatively affect the total assets of the community. To avoid this, it is important to collect and maintain community data in a proper manner, to alleviate unemployment and eventually increase people's incomes.

E-Reparar Online Electronic Appliance Repairing Portal

According to Deshmukh, Maske, Deshmukh, and Mate (2019), in today's world, the internet has made everything more accessible and time-efficient. Tasks that once required hours of waiting in lines, such as paying bills (electricity, telephone, water), can now be done with just a tap. Online shopping for goods like clothes, groceries, and furniture has become equally convenient.

This platform significantly reduces time wastage and makes it convenient for people to have their gadgets repaired at home. It also manages a database that helps track the status of various services for future reference.

Serbigo Serbisyo on the Go!: Online job order mobile application for non-professional workers

According to Juliano, Cruzado, Ramos, and Villarica (2022), the research aims to develop and evaluate a mobile and web application that would enable vulnerable workers in the unorganized sector to offer their services and obtain jobs. The application also seeks to improve user convenience by enabling the efficient management of tasks by matching users with nearby qualified personnel. The researchers quickly transformed system requirements into design and development using the SCRUM software process.

The Black box approach was employed for system testing, while ISO/IEC 25010 software metrics and the Technology Acceptance Model were used for evaluation. The program was thoroughly tested in a range of circumstances, proving that it was fully functional and prepared for use. Both service providers and seekers showed high satisfaction with the application's user experience and earning potential. Evaluation emphasized the application's relevance, timeliness, and effectiveness, especially considering current international events. Developing a business plan, financial analysis, and implementation strategy is necessary to guarantee profitability and community benefit.

Implementation of an Android Mobile Location-Based Service Application for General Auto Repair Shops

According to Guevarra and Ignacio (2021), the study focuses on creating an Android mobile application that uses location-based services, such as platforms like Yelp and Zomato, because of the need for a location-based service, especially as a mobile application. Using the location-detecting features of smartphones, this app was created with the express purpose of helping users find the closest vehicle repair shops. The intention was to help service providers and clients needing local car shops. Android Studio was used for development, and five local auto shops were used for testing to confirm that the app

could perform as intended, including giving directions and describing available services.

CAC Express: A Santa Rosa-Based Courier Service Made Accessible through Mobile

Application

According to Dena, Nera, and Baricanosa (2022), the study investigated whether establishing a courier service in Sta. Rosa with the moniker CAC Express, or Cheryl Alyana Carmen, would be possible in Sta. Rosa, Laguna, uses a smartphone application designed to make it available. Customers can use the program to remotely access CAC Express's services without the requirement to physically visit the business. Customers can use this app to choose exactly where they want their deliveries to be made, choose from a wide range of payment methods (including Mobile Credit for electronic load payments), and track their deliveries in real-time. The goal of this descriptive study is to transform the availability of courier services, adding value to the company and giving Small and Medium-Sized Enterprises (SMEs) a substitute for traditional logistics and transportation.

Figure 1

Conceptual Model of the Study
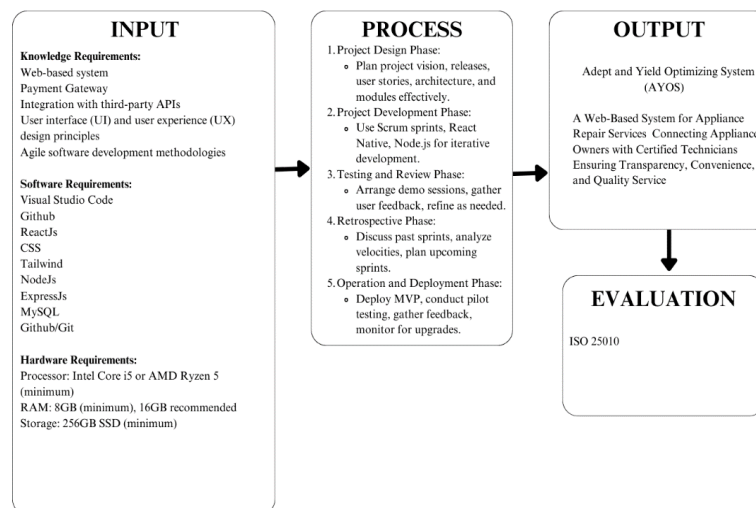
Input

This describes the foundational elements required for the development of the project. It includes knowledge in web-based systems, payment gateways, and API integration, emphasizing the importance of user interface (UI) and user experience (UX) design principles. It also highlights proficiency in agile methodologies for effective project management. It also emphasizes skills in agile methodologies for efficient project management. The software requirements list major development tools such as Visual Studio Code, GitHub, ReactJS, Node.js, and MongoDB Cloud, which are necessary to develop and maintain the system. The hardware requirement consists of at least an Intel Core i5 or AMD Ryzen 5 processor, 8GB of RAM (16GB is suggested), and 256GB SSD storage. Such specifications guarantee that the development environment executes efficiently.

Process

This module defines the individual phases of the software development process:

- Project Design Phase: Project vision, releases, architecture, and module structures planning.

- Project Development Phase: Execution of the Scrum agile approach with iterative development via sprints.

- Testing and Review Phase: Organize the demo sessions and collect the users' feedback.

- Retrospective Phase: Look at the past sprints, compare the speed and planning

- of the upcoming sprints.

- Operation and Deployment Phase: MVP (Minimum Viable Product) launch,

- testing a pilot, accepting feedback, and monitoring for changes.

Output

The anticipated outcome of this process is an "Adept and Yield Optimizing System (AYOS), a Web application for appliance repair services. The key features and functions of this application are:

- A gateway for appliance owners to file a complaint and avail of the repair centers. Observance of openness in the repair process, allowing owners to track the status of their repair request.

- Convenience to the owners in an effortless process from reporting the issue through to receiving the repaired appliance.

- Guaranteed quality service through bringing owners together with certified and qualified technicians.

Evaluation

The developed AYOS system was evaluated against the international standard, ISO/IEC 25010: a framework for assessing software quality. This standard evaluates key characteristics such as functionality, reliability, usability, efficiency, maintainability, and portability. By adhering to this standard, the system's performance, user satisfaction, and long-term maintainability will be rigorously tested and validated, ensuring the final product

meets high-quality benchmarks for both developers and users.

Operational Definition of Terms

Appliance refers to electronic home devices like refrigerators, washing machines, air conditioners, etc. that need repair.

Authentication refers to verifying user identities before allowing access to accounts. Done via passwords, OTPs, biometrics, etc.

Database refers to a structured repository for storing platform data like user profiles, job listings, etc. Uses MongoDB Cloud technology.

Encryption refers to encoding data using cryptographic algorithms to protect the confidentiality of sensitive information. Done via TLS, HTTPS, etc.

Firewall refers to a network security system that monitors and controls incoming and outgoing network traffic based on security rules.

Gadget refers to portable consumer electronics like cellphones, tablets, laptops, etc., that need repair.

Job listing refers to the details of an appliance posted publicly by the user for professionals to view and apply for.

Load balancing refers to distributing incoming network traffic across multiple servers to optimize resource use and prevent overload.

Notifications refers to sending users real-time alerts about events like booking updates, tracking, etc. via push notifications.

On-demand service refers to a model where services are provided to customers promptly based on real-time requests and needs. Our project utilizes on-demand principles to connect users and appliance repair professionals.

Payment gateway refers to a third-party service like Stripe that is used to securely process transactions and card payments on the platform.

PI (Application Programming Interface) refers to the use to enable integration between the platform and external systems like TESDA database, payment gateways, etc.

Platform refers to the mobile application and website developed to enable on-demand appliance repair services. It serves as the bridge linking customers and service providers.

Pricing framework refers to the transparent structure where professionals provide price quotes and negotiate pricing with users upfront.

Rating refers to user feedback on the platform given in star ratings to reflect the quality of professionals. Impacts profile visibility.

Repair professionals refer to skilled service technicians who handle appliance/gadget repair jobs. They are listed on the platform and matched to user service requests based on factors like location, availability, etc.

Repair request refers to a service request created by a user providing appliance/gadget details, problem symptoms, location, etc. to get quotes from professionals.

Review refers to more detailed user feedback about their service experience provided as open-ended comments.

Scheduling refers to the system that enables users and professionals to schedule repair appointments at preferred times based on mutual availability.

TESDA refers to Technical Education and Skills Development Authority. TESDA credentials will be used to verify the skills and qualifications of registered professionals.

Users refer to an individual who requires appliance/electronic gadget repair services. Users create accounts and profiles and make repair requests on the platform.

Vetting refers to a background verification process used to check the credentials and suitability of professionals before listing them.

Web server refers to hosts the backend application code and exposes APIs for the frontend to consume. Popular stacks include LAMP, MEAN, etc.

Web app refers to native apps built for Windows and macOS mobile platforms to allow users to access the platform on their Computer/Laptop

Account verification refers to the process of confirming a user's identity to ensure the legitimacy of user profiles on the platform.

Admin panel refers to the control interface accessible only to platform administrators, allowing them to manage users, monitor activity, and oversee platform operations.

Booking confirmation refers to a notification sent to users and professionals once a repair appointment has been scheduled and agreed upon.

Cancellation policy refers to the terms and conditions regarding the cancellation of a scheduled repair service, including any associated fees.

Customer support refers to a feature on the platform offering assistance to users and professionals via chat, email, or phone for inquiries, issues, or technical difficulties.

Data retention policy refers to guidelines that outline how long user and transaction data are stored and securely deleted after the retention period.

Device compatibility is the set of devices, such as Android, iOS, Windows, and macOS, that users can use to access the AYOS platform.

Digital signature is an electronic signature employed by professionals or users to verify the service agreements, guaranteeing compliance with the law.

Geolocation is GPS technology employed to identify the user and the technician's

locations, enabling location-based service matching and travel time estimation.

Inventory management is the system through which technicians are able to deal with and account for parts and materials required to carry out repairs.

Job history is the report of completed work orders and transactions per user or expert, made visible within their profile.

Multi-factor authentication (MFA) is a security feature requiring users to prove their identity by several means before logging in to their account.

Performance metrics are the standards, such as response time and customer rating, utilized to calculate the quality of the service rendered by the technicians.

Personal data protection is the set of security measures taken to safeguard user data, such as encryption and access control, to maintain data privacy compliance.

Profile visibility is the visibility a professional's profile has on the platform, depending on the ratings and job completion ratio.

Real-time tracking is an option that enables users to monitor the location of a professional on the way to the client's home.

Referral program is a function that incentivizes users to refer new clients to the platform, usually offering rewards and benefits for every successful referral.

Revenue sharing is the proportion of service charges or revenue between the AYOS platform and technicians, depending on the completed transactions.

Service area describes the geographical areas where the AYOS platform operates; it can be in a city or a province and matches users with the technicians.

Service categories describe various repair service types such as appliance repair, gadget repair, and installation services.

Service warranty describes a guarantee issued by the platform or professional that finished repairs are up to standard.

Subscription plan is a payment choice that lets the clients or technicians pay a recurring charge for enhanced web application features or additional access.

User agreement is the terms and conditions stating the regulations and obligations of clients and technicians on the website, agreed upon upon account setup.

Chapter 3

METHODOLOGY

This chapter outlines the research methodology used in the study, such as project design, development, operational and testing procedures, and the evaluation method.

Project Design

The project design specified the conceptual outline and key features of the AYOS platform. It shows the increasing demand for appliance repair services by adopting innovative technology and benefiting from TESDA's database of certifications to verify the technician's credentials. Discovery, scheduling, transparency, and sustainability are the crucial features incorporated to enhance user experience and facilitate the success of the on-demand model of service.

Use Case Diagram

The Use Case Diagram is a widened illustration of the process in a Repair Management System, the system aimed to enhance the repairing process for both users (client and technician). The intention of this illustration was to provide a well-organized presentation of our system's function and major users within it.

The three users are represented in the diagram and are all important to the web application's functionality. The first actor is the client; they are the ones who post their concerns about their appliances, they are also the ones who arrange the appointments, and they are the ones who will decide on which technician will repair their appliance. The second actor, the technician, is responsible for answering repair requests from the clients, scheduling appointments, and performing repairs. Both clients and technicians use activities like profile handling and history view to facilitate efficient workflow and good

communication.

Additionally, the diagram has an administrative function related to handling user profiles, authenticating credentials, and monitoring system activities such as viewing dashboards, handling appointments, and updating the technician list. Every variable in the diagram, like "Login" and "Make Payment", is intended to make our web application run smoothly, for better client and user interactions.

This chart is a holistic depiction of the system, focusing on its operation and interaction between clients, technicians, and administrative activities to support a solid repair management process.

Figure 2

Use Case Diagram

Note. In the Repair Management System, both the clients and technicians have different roles that help keep everything running smoothly. Clients can do basic things like sign up, log in, and create an account. They can also fill in their repair needs, choose a technician, set up an appointment, and pay after the job is done. They can pay online or pay the technician directly. They can also mark the technician accordingly based on how they were serviced. Customers also have the capacity to update personal information and retrieve their history using the Technicians. The feature of "specify details" assists them in describing what they need to repair on their equipment, and by using the feature of "make an appointment," the scheduling of an appointment is simpler. Rating the technician helps not only the technicians but also the clients, who will see the ratings.

Technicians, on the other hand, interact with the system by responding to clients' requests, managing appointments, completing repairs, and maintaining and editing their profiles. While utilizing the 'manage appointments' feature, the technicians are ensured proper task scheduling as the "respond to request" module enables them to receive a client's requests. Also, the technicians can save clients' communication using the messaging feature.

The Administrative module is essential in the management of the users, clients, and technicians' accounts, verifying credentials, overseeing system monitoring information through the dashboard, and scheduling appointments and technicians. The Administrative module has maintained safety and function through "Verify Credentials," "View Dashboard," and "Manage Appointments." These capabilities allow for the ease of scheduling appointments and the safe functionality of performing a task through the platform. The use case diagram also demonstrates the relationship and interaction with the

system's various components and depicts the organization and divisions of functions in relation to the platform's main users and administrative functions.

Software Design

The diagram illustrates the hierarchy of the platform's Admin, Technician, and Client modules. It details how each main module is divided into smaller sub-modules designed for specific tasks, with each sub-module connected to its respective parent module.

Figure 3

Hierarchy Chart
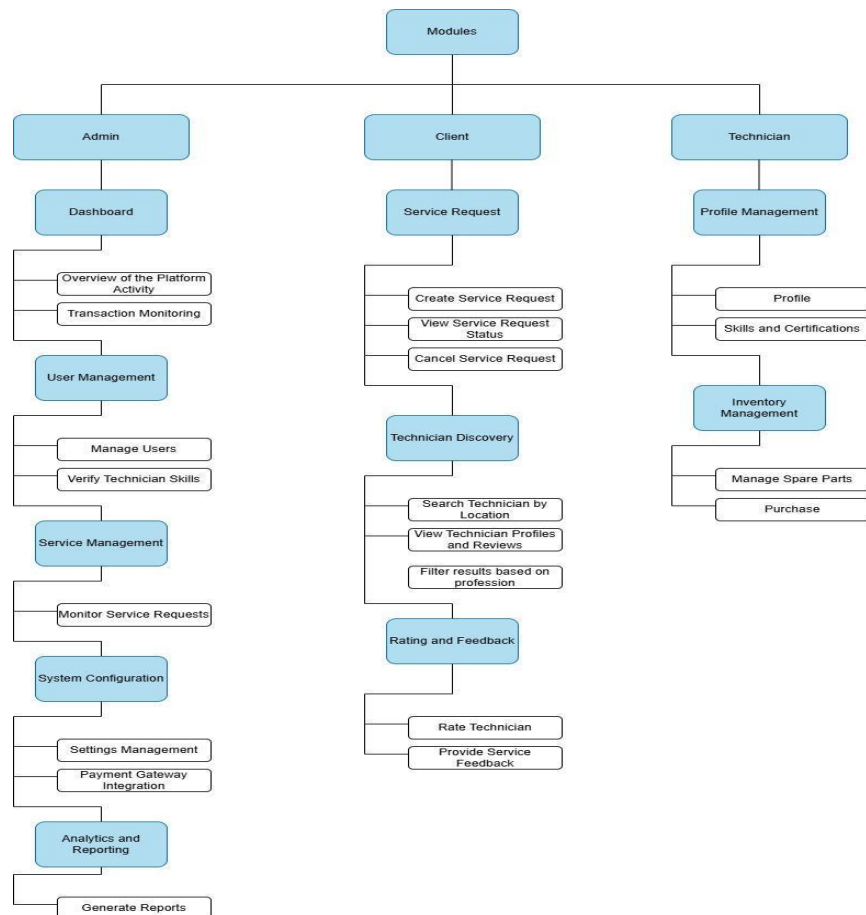
Note. The diagram illustrates the framework of the AYOS system with Platform Core as the most upper layer serving the Admin, Technician, and Client modules. Every module also contains sub-modules for supporting platform actions, communications with the user, requests for service, and responses. Platform Core offers services like payment integration, TESDA integration, and notifications to enhance the services of other modules further.

Admin Module enables platform managers to administer and oversee all platform activities. It consists of sub-modules like Dashboard for monitoring activity and transactions of the platform, User Management for managing users and verifying technician abilities through TESDA Integration, Service Management for supervising service requests and complaints, System Configuration for managing platform configurations and payment gateways, and Analytics and Reporting for creating insights and strategy reports.

The Technician Module helps technicians to keep their profiles, services, and inventory up-to-date. Profile Management, under which technicians can edit their professional data and view TESDA certificates, Service Management for handling incoming service requests and job status updating, and Inventory Management for monitoring and managing spares are prominent sub-modules.

The Client Module permits clients to request services, find technicians, and post feedback. Sub-modules are Service Request for requesting and monitoring service requests and ordering, Technician Discovery for technician profile discovery and viewing, and Rating and Feedback for rating technicians and posting feedback on work performed.

The diagram overall, graphically displays the hierarchy and flow of the system, showing

the directions the users can pursue to use various features and have smooth platform functioning in clear sight.

Figure 4

Context Level Data Flow Diagram Level 0
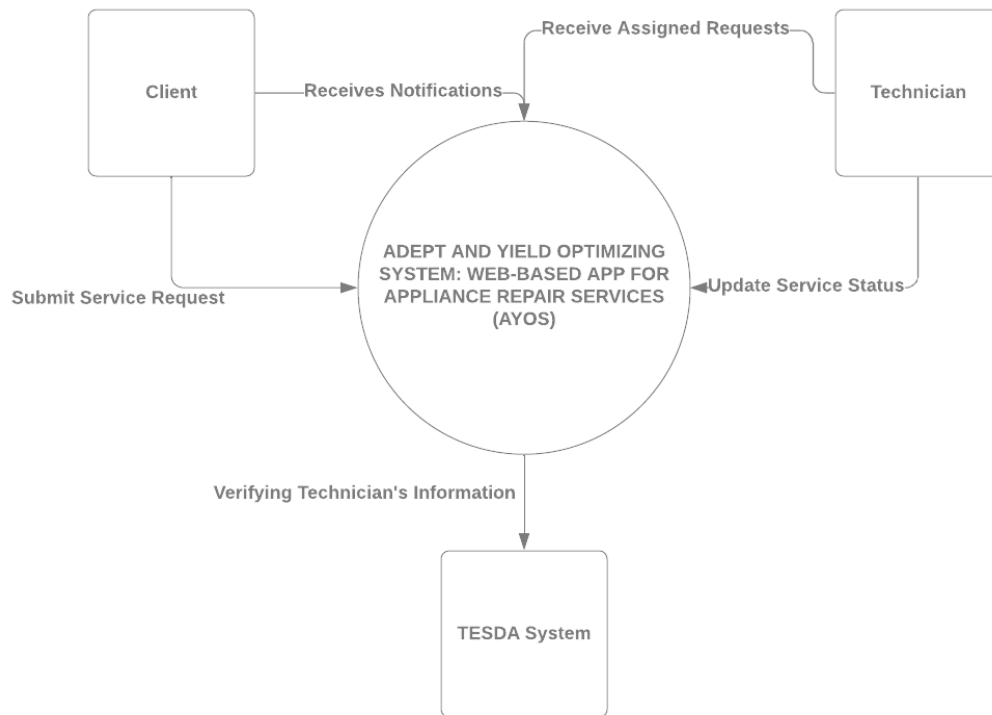
Note. The one presented below is a Level 0 Data Flow Diagram (DFD) of the "Adept and Yield Optimizing System - Web-Based Application for Appliance Repair Services (AYOS)." It illustrates the interaction of the primary entities: The Client, the Technician, and the TESDA System. The Client submits information about the appliance

that is inputted to the AYOS system, and the Client is notified regarding the request status or updates from the technicians. The Technician works on the system by accepting assigned service requests and updating the service status so that the client and AYOS system will be notified about the advancement of the work done.

The TESDA System, a certification or verification entity, is used by AYOS to verify the information or qualifications of technicians to ensure legitimacy and trustworthiness.

The AYOS system serves as the central process managing all interactions. It handles service requests from clients, assigns them to available technicians, sends notifications to clients about service progress or updates, verifies technician information via the TESDA System, and processes updates from technicians about service statuses. The flows of information data include, among others, the submission of service requests by clients, notifications to clients, assignment of service requests to participating technicians, service status updates done by the technicians, and verification of the technicians' details with the TESDA System. This configuration maintains the flow of interaction and task distribution within the system.

Figure 5

Context Level Data Flow Diagram Level 1
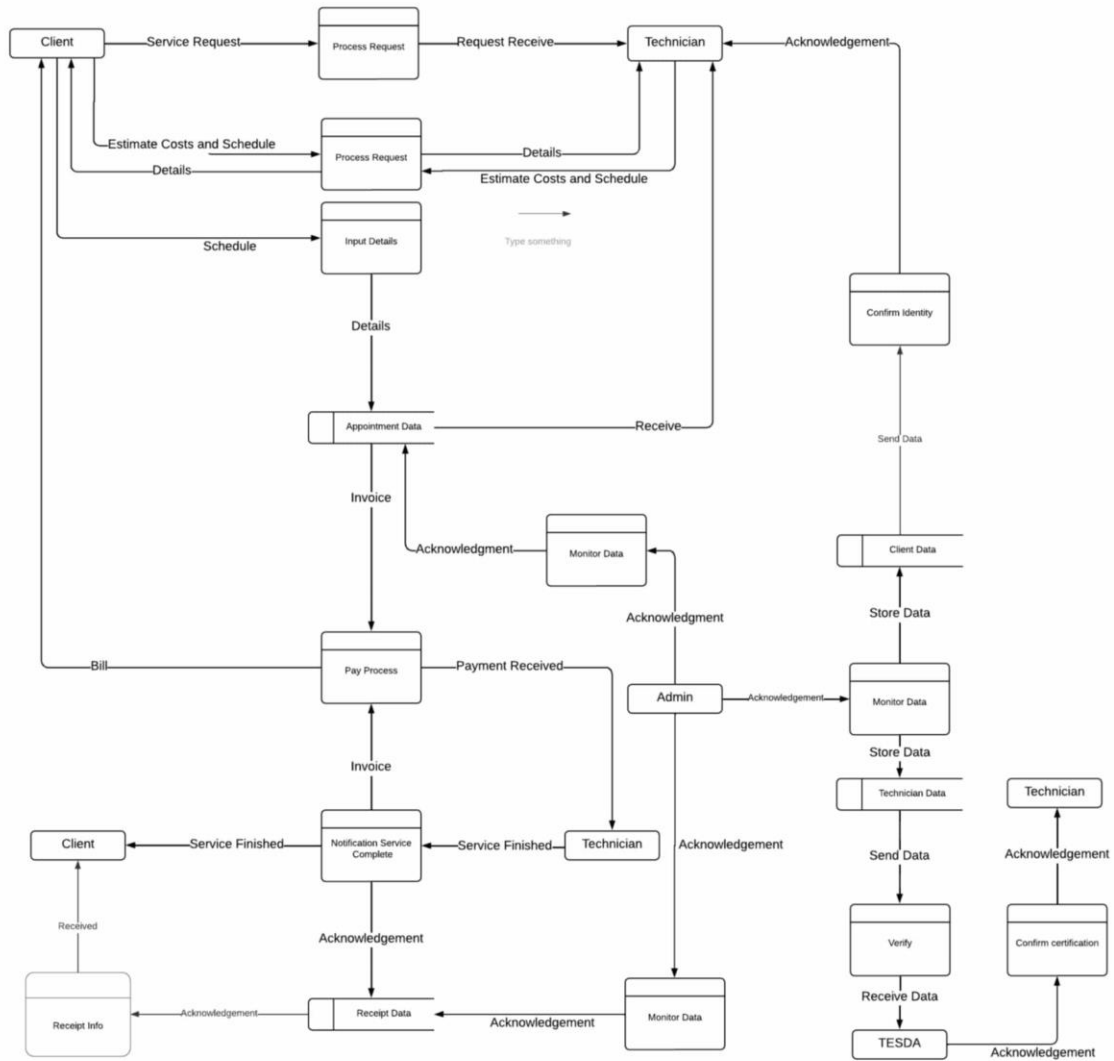
Note. Figure 5 shows the system flow for managing technical services with appointments. It provides an orderly and clear-cut method of servicing and processing requests. The flow of the process starts with a client opening a service ticket for technical help. This Ticket is sent to the Processing Request stage, where the system analyzes the information and sends it to the Technician for confirmation and evaluation.

The TESDA System is crucial at this moment because it confirms the technician's qualifications, which are essential for the tasks, since only certified and competent technicians can be issued the work order. After this has been done, the technician evaluates the request, works out the Estimate of Costs and Schedule, and submits this information back to the client using a system, thus enabling a feedback mechanism to reach agreement and clarify expectations concerning the service.

After all the parties have agreed to the terms, the Inputting Details phase begins, where all pertinent information, including the day, time, and the technician to be assigned, is captured into an Appointment Data File. This file consists of important fields: appointment ID, user ID, document data, amount, date, payment status, etc. With the information correctly entered, the client and the technician are notified or mocked in the system to claim that they have given a nod of consent and confirmation. Then, an invoice is generated, prompting the client to initiate the payment process to finish all mandatory payments. Once payment is made, the technician can proceed with the service. Upon completion, a Service Complete Notification is issued. The technician notifies the system, and it subsequently sends a notification to the client that the service is complete. The client's confirmation constitutes the last action the system requires and in order to maintain proper documentation, the Complete Service Data File will also be updated.

Within this sequence, the Admin controls the workflow, checking every action performed through the User Data File and Appointment Data File, smoothens operation, safeguards data accuracy, and upholds compliance. The Client, Technician, and Admin have separate roles but deal with the same system of files that enable the execution of operations like billing and scheduling of users.

Having the system tied to TESDA platforms increases the confidence and dependability of the system since it verifies the skills of the technician beforehand. This system guarantees accountability, practicality, and usability not only for the clients but the technicians as well by giving them real-time information and keeping an up-to-date record of every interaction.

Figure 6

Entity-Relationship Diagram
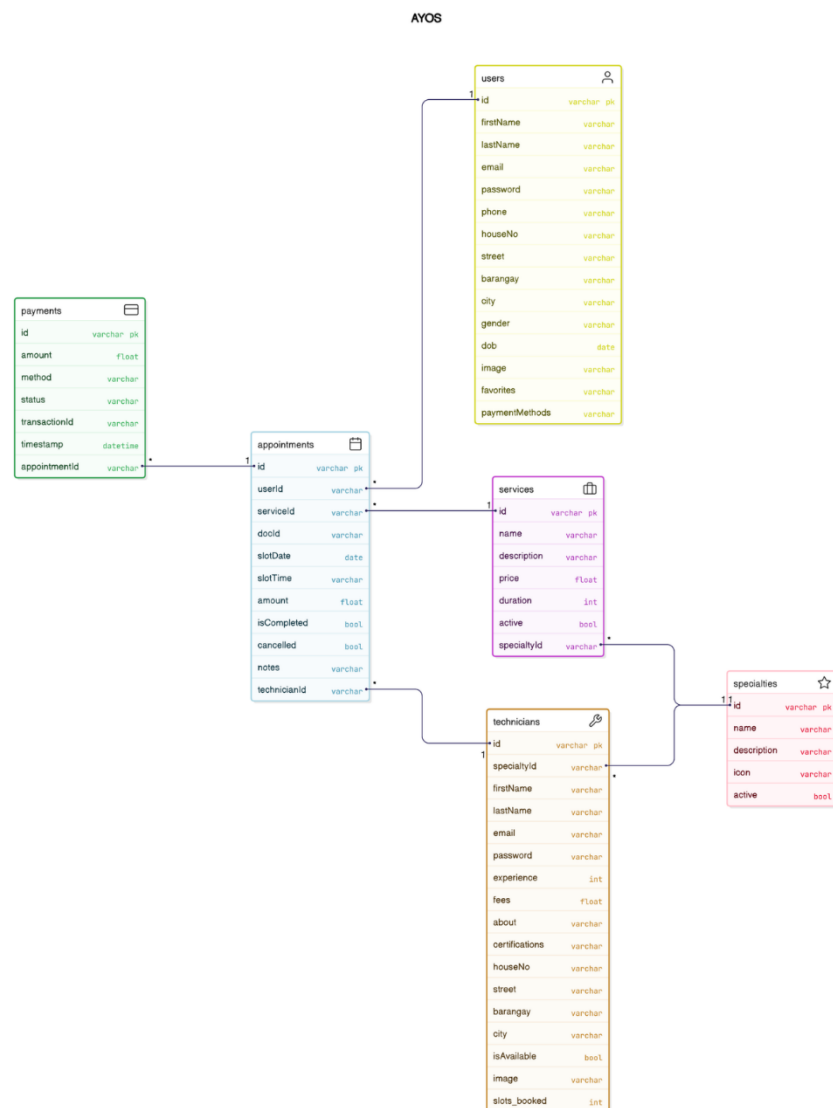
Note. The diagram illustrates the database structure of AYOS, a web application

that makes it easy and convenient to book the services of technicians. Imagine it as the cyber spine that harmonizes everything from user and technician account creation to appointment scheduling and payment. Three major components form the backbone of this system: Users, Technicians, and Appointments. In addition, these are Services, Specialties, and Payments, which aid in integrating the system.

The Users section is where the clients' data is housed. Everyone signing up on the website is given an individual profile with their name, email address, address, gender, birthday, and picture. They can even select a number of payment accounts or services to be marked as preferred. The personalization feature significantly assists in giving the users a customized experience.

Technicians are the individuals who perform the services, so they are the first key user role. Every technician also has a profile with their personal and professional details, including their name, email, experience level, fee rates, certificates, and short bio. They may upload a profile photo and use a password to enable them to log into the system, making it professional and trustworthy on the platform. The platform has enabled booking for appointments, hence controlling their availability based on how many appointments they have already set.

The Appointments page is where everything meets. This is where technicians and users meet. It keeps track of which user had which service with which technician, and when. It tracks date and time, charge, completed or canceled status, and any comments.

There's also flexibility for assignment of technicians, which can accommodate last-minute changes or rescheduling.

There is a Payments table for managing payments. It records all transactions, the amount paid, the method of payment, the transaction ID, and the status of the payment. Each payment is linked to an appointment, so everything remains clear and traceable.

The Services table lists all the services customers can schedule, from home maintenance to technical support. Each service has a name, description, cost, and estimated time. The services are grouped using the Specialties table. Specialties are broad types like plumbing or electronics, and they help users quickly locate the kind of assistance they need.

Moreover, this database is a good foundation for running a reliable and efficient service platform. It monitors who is who, what they are doing, what has been reserved, and what has been paid. With all of these elements working, AYOS can offer an uninterrupted experience to users looking to book services and technicians ready to help.

Figure 7

Business Rules
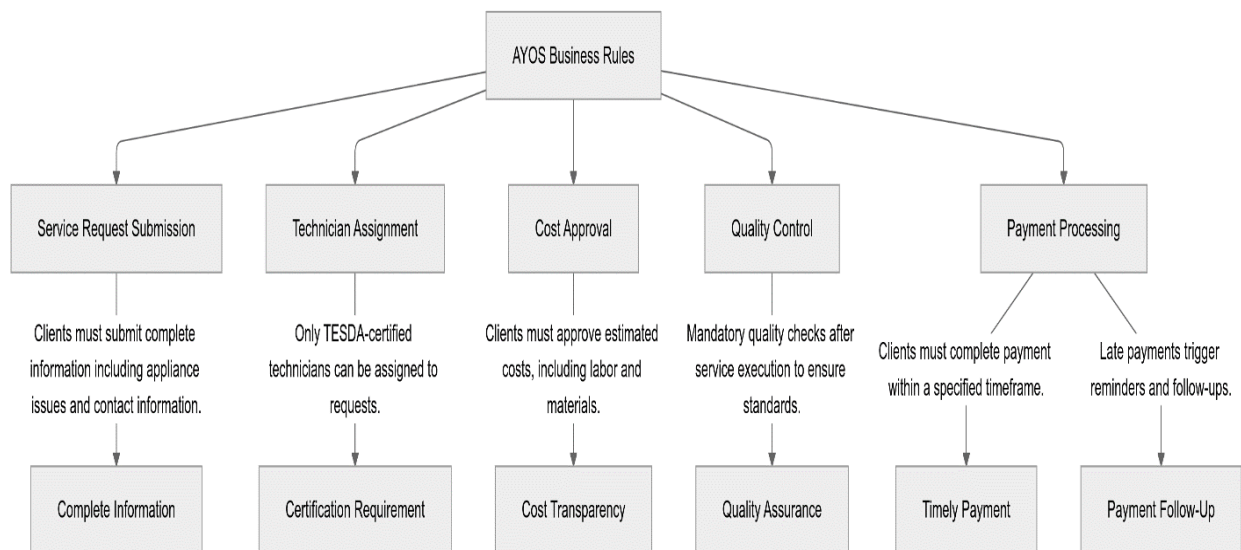
Note. The illustration explains the fundamental business rules of AYOS, meant to promote efficiency, quality, and transparency of service. Some of these rules are transparent orders of service, TESDA-certified mechanics, client signing off on charges, post-service quality checks, and systematic payment processes, among others, for a seamless and efficient service delivery.

One of the chief regulations is the necessity for clients to offer complete problem descriptions and phone numbers when filling in service request forms. Doing this ensures the technicians receive the background information necessary for resolving the issues properly. Only technicians accredited by TESDA can proceed with service requests, ensuring everyone receives professional-grade repair work maintained at high-quality

levels.

Furthermore, the cost approval process obliges clients to confirm the quotes of labor and material costs prior to scheduling services to ensure transparency and build confidence. Following completion of the service, quality inspections are conducted to establish that repairs conform to expected standards, increasing client satisfaction. Payment procedures are also well-defined, where payment becomes due within a stipulated period. Any delayed payments attract reminders to hasten collection and ensure timely remittance.

Collectively, these business rules create a cohesive framework that enhances the general functionality, service delivery, and stability of the AYOS platform to ensure both client satisfaction and operational efficiency.

Project Development

Figure 8

Agile Scrum Framework
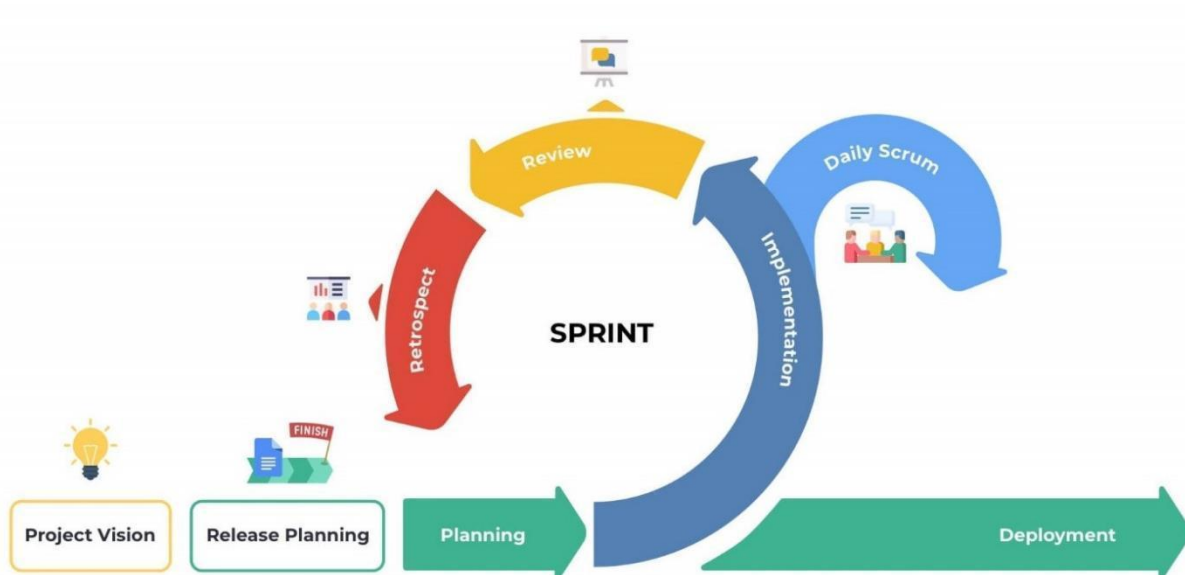
This project used the Agile Scrum process as our software development life cycle (SDLC) process. SDLC is a formal and continuous procedure, consisting of various phases, with the final aim of ensuring the software is user-need-friendly and runs smoothly and reliably.

Agile Scrum Framework

Agile frameworks are commonly used for project development and management; among them, Scrum Methodology is used because it is structured, scalable, and iterative. Scrum is an effective mechanism for large-scale projects not only for technology, but it provides the flexibility to Cook-Seymour for rapid development cycles, and to continuously incorporate user feedback.

The Scrum framework consists of the following phases and roles:

Phases:

- **Project Vision Phase:** Establish the core vision, objectives, planned features, success metrics, projected milestones, and completion timeline for the app connecting technicians to potential employers.

- **Release Planning Phase:** Map out agile releases spanning multiple development sprints to create prioritized capabilities per the project vision.

- **Sprint Planning Phase:** The product owner selects concrete user stories for each 2-4-week sprint from the ranked backlog, which are then broken down into development tasks and assigned to team members.

- **Implementation Phase:** Developers code app features matching specifications in

user stories for the sprint timeline using React Native, Node.js, and cloud databases. Continuous integration testing occurs to identify defects early, and daily standup meetings enable progress inspection.

- **Review Phase:** Demo sessions with simulated test user groups are arranged at the end of sprints to gather feedback on usability factors and identify required improvements.

- **Retrospect Phase:** The team discusses the previous sprint execution, including CI/CD pipelines, test coverage, staging environments, and coordination lag to brainstorm process-level refinements.

- **Deployment Phase:** The minimum viable product will be deployed on dedicated cloud infrastructure for controlled pilot testing by priority user segments, enabling the gathering of final inputs before formally offering the app.

1st Week

- Define the Project - Outlining all the key features of the AYOS web application.

- Customer profile – Customer information is provided here like name, age, gender, location, etc.

- Service Request - This feature allows clients to input their concerns regarding their broken appliance.

- Appointment Scheduling – It is the process of organizing and managing time slots for client services assigned to technicians.

- Payment method – Clients pay the technician directly after the service is completed.
  - Selected tech stack - It includes React.js for the front-end, Node.js for the

back-end, and MongoDB Cloud as the database, providing a modern, scalable, and efficient solution for our web application development.

- •Set-up Development Environment - Installing necessary tools like repository (github), IDE (VsCode)

2nd Week

- Set up the back-end – Initialize the server and create a basic setup for handling requests and managing data for the web application that connects clients with technicians.

- Develop API routes – Build the necessary endpoints to manage the payment process using the Stripe gateway and integrate Google Maps for location services and real-time tracking.

- Connect the database – Setup theMongoDB Cloud database to store information about clients, appliances, bookings, and repair statuses.

3rd Week

- Linking the front-end to the back end involves integrating API calls to enable clients to pay for services via a payment gateway and track technician locations in real-time. This ensures seamless data flow and enhances user experience.

- Implement user authentication – Allow customers to register, log in, and manage their profiles.

4th Week

- Test the application – Verify that all features work smoothly, including booking

services, updating repair statuses, and customer login.

- Fix any issues – Debug and resolve any errors or glitches.

- Deploy the application – Launch the app on a hosting platform (Netlify) so clients can access it online.

Roles:

- **Scrum Master:** Mr. Ryan Dela Cruz facilitates the development process, conducts meetings, ensures rules are followed, clears obstacles, and mentors the team to fulfill objectives and deliverables.

- **Product Owner:** Mr. Michael Vincent Martin represents customers or stakeholders, sets expectations and product changes, oversees the scrum backlog, and prioritizes goals for each sprint based on importance to stakeholders.

- **Scrum Team:** Mr. Ayuban, Mr. Dela Cruz, Mr. Martin, and Mr. Tulalian are responsible for meeting the goal of each sprint, composed of individuals with analytical and design skills to carry out the necessary work, make deliverable products, and find solutions to problems.

By implementing the Agile Scrum methodology, our development team can systematically analyze, design, and build a high-quality software solution that aligns with user expectations, while embracing iterative and incremental delivery of working software through structured sprints.

Specifications

Figure 9

Homepage Wireframe
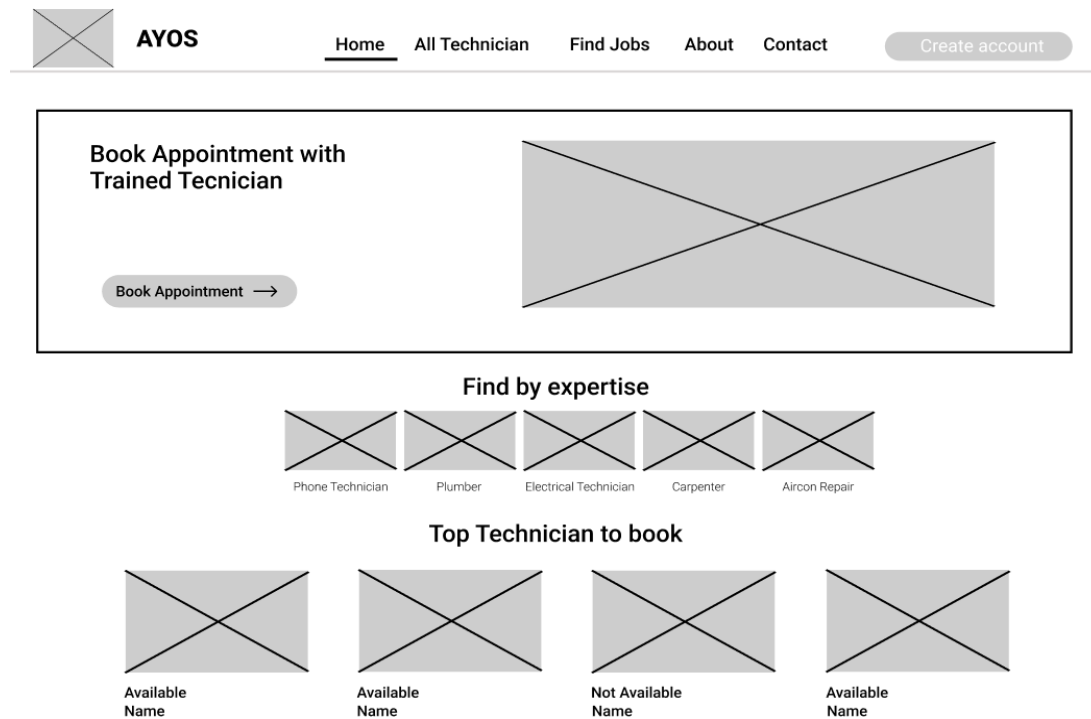
Note. The wireframe shows the AYOS homepage with a header, navigation links, a "Create account" button, a booking banner, and sections for expertise-based search and top technicians.

Figure 10

Client - Login Wireframe

AYOS LOGO   Log in

Login
Please log in to book appointment

Email

Password

Login
Create new account? Click here

Note. The wireframe shows the AYOS login page with a header, a "Log in" link, and a centered login form with email, password fields, and account creation link.

Figure 11

Client - About Us Wireframe

AYOS   Home   All Technician   Find Jobs   About   Contact

About Us

Welcome to ayos

Our Vision

Why choose us:

Note. The wireframe shows the AYOS "About Us" page with a header, navigation links, a main image, sections for "Welcome to AYOS" and "Our Vision," and three

smaller images under "Why choose us."

Figure 12

Client - Contact Wireframe
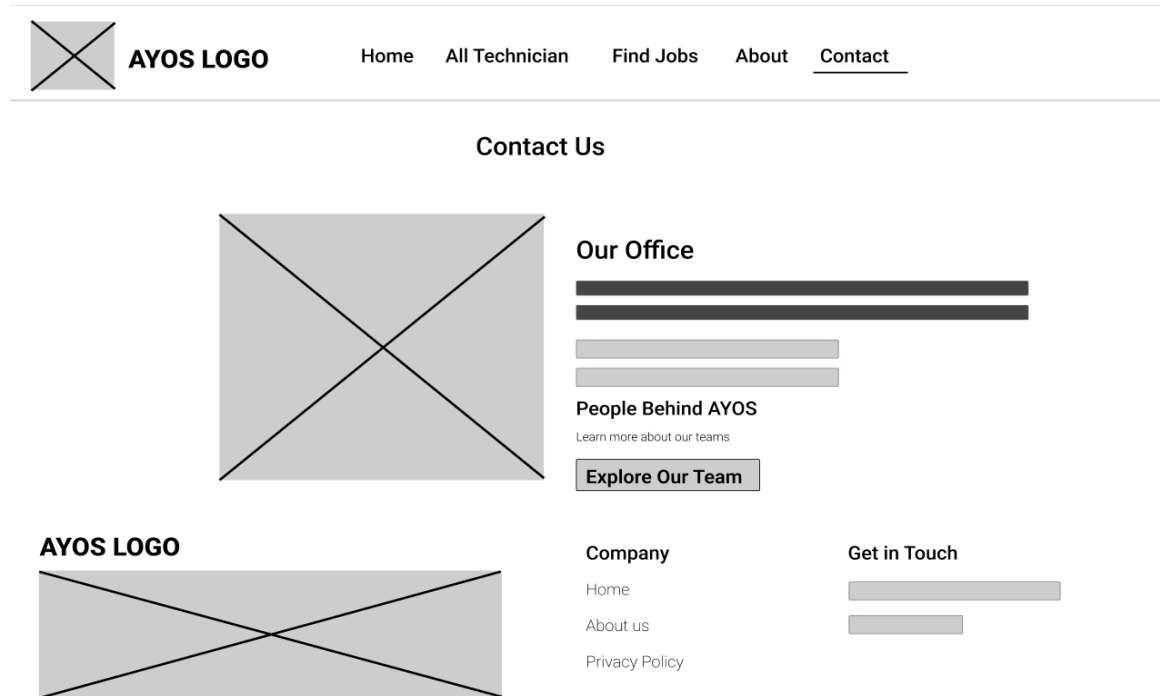
Note. The Contact Us page provides users with information about the AYOS office and team. It includes sections highlighting the company's location, team members, and ways to get in touch.

Figure 13

Client - Create Account Wireframe

> *Note.* The Create Account page offers a clean signup interface with fields for full
> name, email, and password, a disabled button requiring all fields to be completed,
> and a login option for existing users.

Figure 14

Client - Profile Information Wireframe

> *Note. The Profile page displays user details with an editable interface for updates.*
>
> *It has a clean layout and a disabled "Create account" button, indicating limited*

access or completed registration.
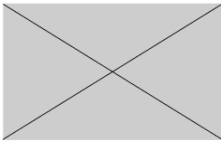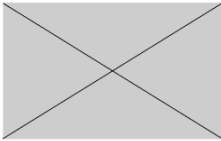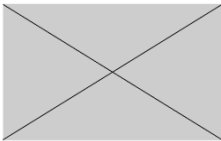
Figure 15

Client - Appointment Wireframe

Note. The Appointment page displays scheduled appointments with technician details, date & time, and options to pay online or cancel. Completed appointments are marked for easy management.

Figure 16

Client - All Technician Wireframe
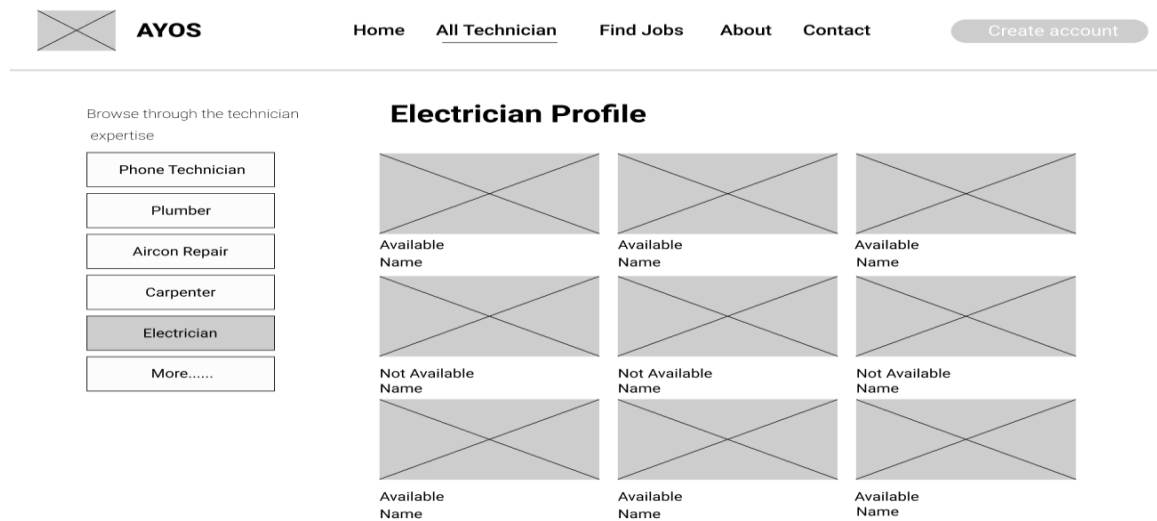
Note. The All Technician screen features buttons on the left and technician pictures in the center.

Figure 17

Technician - Login Wireframe

Note. The Login screen includes email and password fields, a login button, and a

"Click here" link for non-technicians.

Figure 18
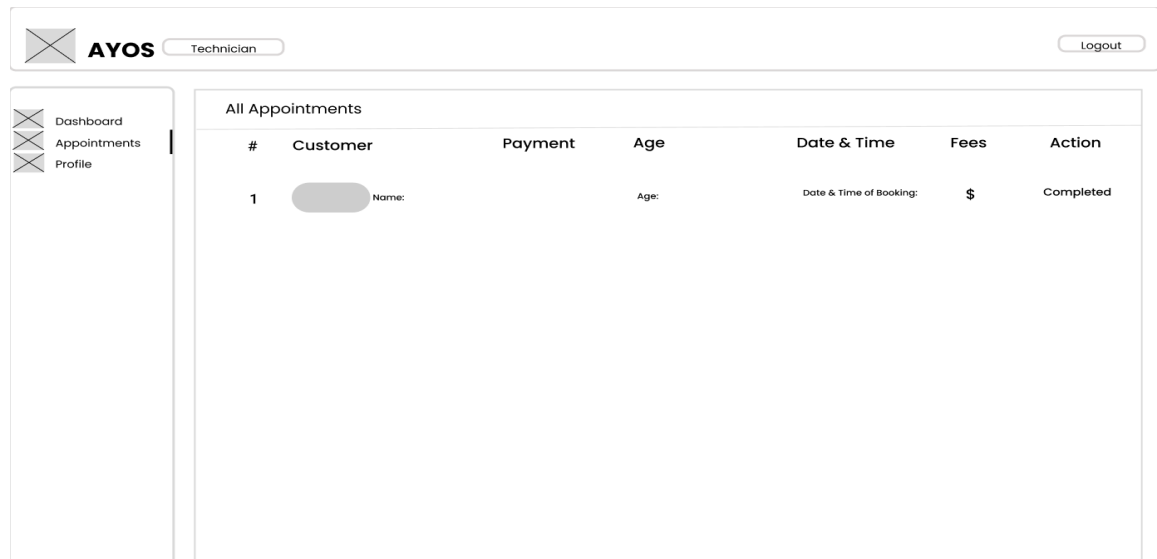
Technician - Dashboard Wireframe
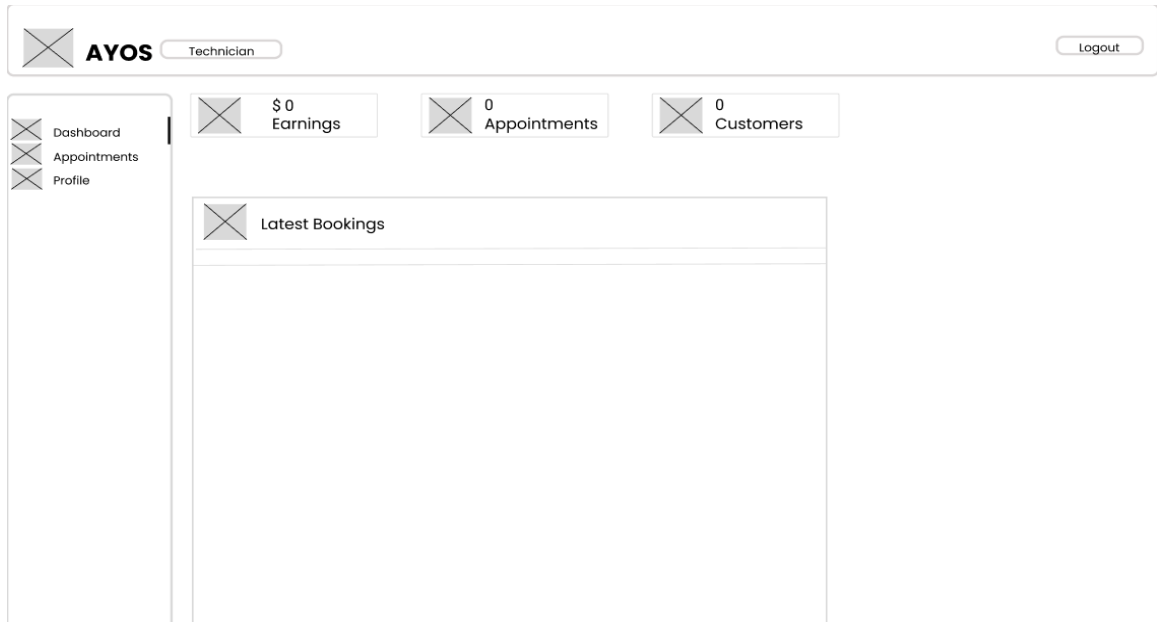
Note. The Technician Dashboard wireframe provides an overview of key metrics, including earnings, appointments, and customers, alongside a navigation panel for accessing the dashboard, appointments, and profile, with a section displaying the latest bookings.

Figure 19

Technician - Appointments Wireframe

> *Note.* The Technician Appointments page wireframe displays a structured list of all
> appointments, including customer details, payment status, age, booking date and
> time, fees, and an action status, with a sidebar for easy navigation between
> dashboard, appointments, and profile sections.

Figure 20

Technician - Profile Wireframe

Note. The Technician Profile page wireframe displays key technician details, including a profile image, name, about section, appointment fee, address, and availability status, with a sidebar for easy navigation to the dashboard and appointments.

Figure 21

Admin - Login Wireframe

Note. The Admin Login page provides a simple and secure interface for administrators to access their accounts, featuring fields for email and password, a login button

Figure 22

Admin - Dashboard Wireframe
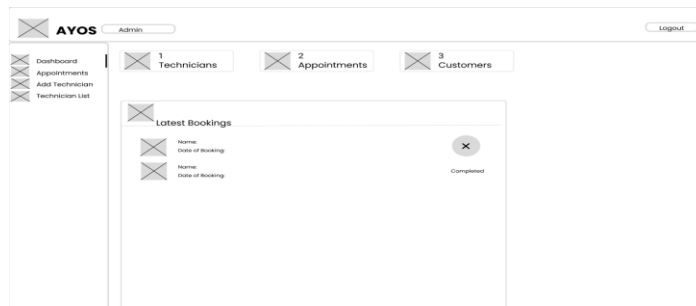
Note. The Admin Dashboard provides an overview of key platform activities, including managing appointments, adding technicians, viewing the technician list, and accessing customer details, with the main section displaying the latest booking status (completed or not).

Figure 23

Admin - Appointment Wireframe
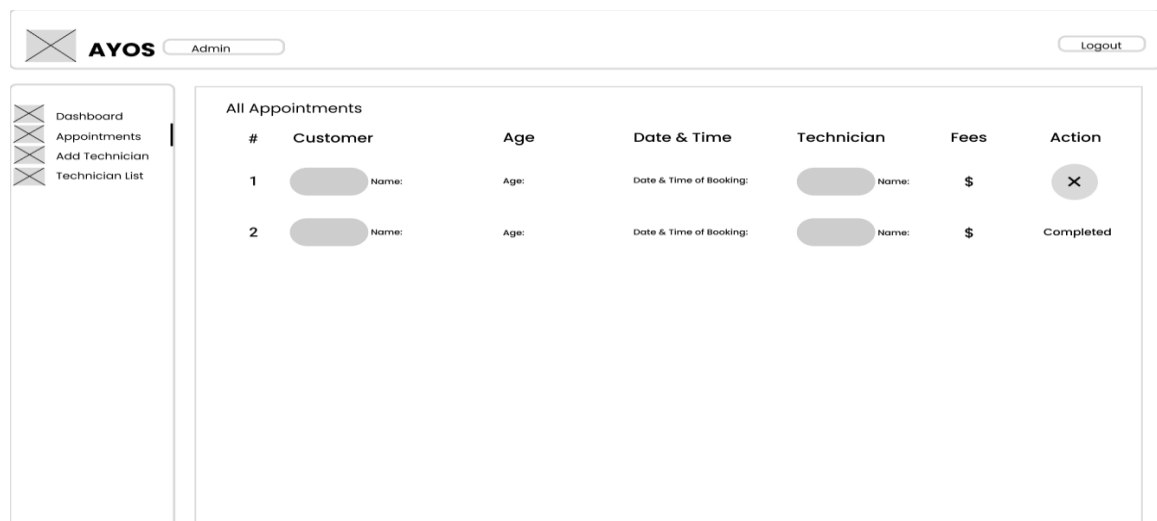
Note. The Admin Appointments page displays all appointments with details such as customer name, age, date & time, technician name, fees, and action status indicating

whether the appointment is completed or not

Figure 24

Admin - Add Technician Wireframe

> *Note.* The Add Technician page allows administrators to register new technicians
>
> by providing their picture, name, email, password, experience, fees, specialty,
>
> certification, address, and a brief description about the technician.

Figure 25

Admin - Technician List Wireframe

Note. All Technicians page displays a list of technicians, including their names and availability status.

Terms and Conditions

- **Acceptance of Terms**

  In using or accessing the AYOS platform (henceforth referred to as the "Platform"), the client agrees to comply with these Terms and Conditions. If the client does not accept these Terms, please refrain from using the Platform.

- **Service Description**

  AYOS is an internet-based service connecting customers with licensed and qualified appliance repair specialists. The Platform facilitates users in finding, booking, and managing appliance repair services.

User Responsibilities

- **Accurate Information:** The users consent to provide proper and up-to-date information while using the Platform, including the contact information, appliance details, and service requests.

- **Respectful Conduct:** The user consents to use the Platform in a respectful and lawful manner, without being rude, threatening, or harassing other users or the technicians.

- **Payment:** The user consents to pay the technician for the services rendered as per the agreement.

Technician Responsibilities

- **Verification:** Technicians should be accredited and certified by TESDA to provide services via the Platform.

- **Professional Conduct:** Technicians should conduct themselves professionally and ethically, abiding by industry regulations and standards.

- **Quality Service:** Technicians undertake to provide quality repair work, utilize genuine parts, and complete their work within the stipulated time.

Platform Owner's Responsibilities

- **Platform Maintenance:** The Platform Owner shall endeavor to maintain the Platform operationally and securely.

- **Dispute Resolution:** Disputes between the user and technician can be resolved by the Platform Owner as required.

- **Data Privacy:** The Platform Owner shall process the user data attentively and in accordance with the law for data protection.

Limitation of Liability

The Platform Owner will not bear liability for direct, indirect, incidental, consequential, or punitive damages resulting from using the Platform or services by the technicians.

Content Information

The AYOS Platform provides its users with access to content only for general information purposes. While measures have been taken to ensure the information presented is accurate, complete, and reliable, make no guarantee as to the appropriateness, availability, or accuracy of any content, goods, services or associated graphics provided

through the Platform.

Privacy

The AYOS Platform strives to be respectful and responsible with respect to user privacy. Clients should refer to the AYOS Platform's Privacy Policy to learn about practices related to collecting, using, and protecting personal information. By accessing and using the AYOS Platform, clients agree to the terms set out in the Privacy Policy, specifically the collection and use of their personal information as set out by the Privacy Policy.

Intellectual Property Rights

All intellectual property, such as copyrights, trademarks, and patents to the AYOS Platform, content, and technology behind the same, are owned by or licensed by the Platform Owner. Users are not allowed to use, reproduce, share, or modify any part of the Platform or its content unless the user has been previously authorized in writing by the Platform Owner.

Modification of Terms

At their sole discretion, the Platform Owner may vary or modify these Terms and Conditions at any time. Any variation or modification will take effect immediately on posting on the Platform.

Payment Method

AYOS Platform supports the following payment options:

- Debit Card
- Account Title:

- Account Number:

- Stripe.

General

These Terms and Conditions constitute the whole agreement between AYOS and its users. These Terms and Conditions supersede all prior agreements. Suppose any term or provision of this agreement is deemed to be invalid, unenforceable, or illegal by any competent court for any reason. In that case, such invalidity, unenforceability, or illegality shall not affect the enforceability or validity of the remaining provisions of this agreement, which shall be valid and enforceable to the fullest extent permitted by law. This Agreement shall be governed by and construed in accordance with Philippine laws, notwithstanding any inconsistency with other laws. Any disputes arising in relation to this Agreement shall be resolved in the Philippine courts, and acknowledge the exclusive jurisdiction of such courts.

By using the AYOS Platform, users agree that they have read, understood, and agreed to these Terms and Conditions.

Secure and Safe Transaction Implementation

In order to maintain confidentiality, integrity, and security of transactions made through the AYOS Platform, the following measures will be implemented:

Secure Payment Gateway Integration

A secure and compliant payment system will be established and appropriately linked in accordance with recognized best practices such as the Payment Card Industry Data Security Standard (PCI DSS), which will protect sensitive financial information including credit card data by encrypting it, and ensuring appropriate security practices

while using the financial information to minimize accidental or unintentional interception or misuse.

Strong Password Encryption

401 will enforce stringent password policies requiring all users to use complex passwords (upper and lower case, numbers, and special characters), and store all user passwords securely via encryption so that they are not usable if compromised by an accidental or malicious outside data breach attempting to access our system or data stored on our system.

Secure Data Storage

All stored user data (identified or identifiable data and financial information) will be securely stored using the most productive encryption or state-of-the-art method available for verification by third parties such as auditors, etc. Measures will be undertaken to prevent inappropriate technology or methodology that puts any stored data at risk to a data breach, unauthorized access, or compromise of the data stored.

Regular Security Audits and Penetration Testing

Security evaluations and vulnerability checks will be carried out on a regular basis to identify any issues or potential threats. This will help us address security concerns more effectively and improve our defense plans.

Fraud Detection and Prevention

Advanced fraud detection methods will be used to maintain the integrity of transactions and interactions on the AYOS Platform. For example, it will include machine learning algorithms, which can recognize patterns associated with suspicious or fraudulent activity. The system is going to take an active approach to detecting and preventing scams

to protect customers and technicians from being victimized by crime.

Secure Communication Protocols

AYOS will employ secure communication protocols to ensure the confidentiality and integrity of all data communicated between client devices and the AYOS Platform. The AYOS platform will use Hypertext Transfer Protocol Secure (HTTPS) to encrypt all data in transit. This will mitigate the risk of the following situations, among others, from happening during transmission: unauthorized access, data interception, and malicious access to data.

Regular Software Updates and Patches

The platform will be maintained, and its underlying infrastructure will be kept up-to-date with the latest security patches and updates addressing vulnerabilities to ensure overall security. These measures shall render an environment secure enough for both the users and the technicians to perform transactions without any doubt.

Rating Reviews

By submitting a rating and review, users agree to the following terms and conditions:

Honesty and Accuracy

Users will provide honest and accurate feedback based on their experience with the AYOS platform and its services.

Respectful Language

Users will use respectful language; abusive, offensive, or discriminatory content in the ratings and reviews shall not be allowed.

Fairness

Users commit to giving impartial and balanced feedback, taking into account both the positive and negative aspects of their interactions.

No False or Misleading Information

Users agree not to submit ratings and reviews containing untruthful, misleading, or deceptive content.

No Commercial Activity

Users agree not to utilize the rating and review system for commercial benefits, like advertising their own business or services.

Platform Rights

The AYOS platform holds the authority to assess, modify, or eliminate any ratings and reviews that breach these terms and conditions or are considered unsuitable.

User Consent

When submitting ratings and reviews, users give explicit rights to display their feedback on the AYOS platform for the general public to view. Users are advised to provide constructive feedback that helps to improve the service being offered on the platform. Following these terms and conditions encourages users to feel respected and supported in the review submission process.

Implement Insurance

In order to fulfill the requests of users of the AYOS platform to establish trust and certainty, it is necessary to implement an insurance policy to build confidence against damages during service appointments. This insurance policy will provide financial guarantee if the technician's service incurs unexpected damage to the home appliances

when providing other repair services.

The new platform will use a reputable insurance provider to develop a coverage policy specifically for the needs of on-demand appliance repair services. The coverage will include coverage for things that could happen, like accidental damage to its components or equipment, damage caused by water entering an appliance, and electrical faults, among others.

Users could have the option to buy this coverage at an additional fee while making their booking. The coverage fee may be decided through elements such as the kind of equipment, how complex the restoration is, and the length of time the carrier will take. If a consumer wishes to make a claim, they could accomplish that through the AYOS platform or by reaching out to the coverage enterprise. The coverage company will then examine the claim, and if it's accepted, they'll reimburse the consumer for the restoration or substitute expenses for the broken equipment.

By offering coverage, AYOS seeks to provide greater customer safety and similarly toughen its recognition as a reliable and credible platform for on-call equipment restore services.

Operation and Testing Procedure

To examine the Reliability of the machine for the Technician`s Account, the method that follows may be implemented:

Issues and Concerns

1. Customers deciding on the great technician for their equipment repairs.

2. Clients paying technicians on line after offerings are completed.

3. Technicians use their charges to sell their offerings.

4. Ensuring the steady garage of person files and information.

5. Allowing customers to make extra bills through debit cards, and Stripe.

6. Users updating their profile information.

7. Facilitating user registration through Google and Facebook accounts.

8. Confirming users' identities by reviewing them on the admin dashboard

9. Requesting technicians with unique specialties through the process request form.

10. Adding referral codes to technician quotes.

Table 1

User Classification

User Classification	Recommendations	Steps to be taken	Expected Output
Technician	Client	The Technician will visit the AYOS Web application. Technicians can choose what appliance she/he wants to repair. After the Client accepts the response from the Technician, they can discuss the issue about the defective appliance.	Following a discussion regarding the defective appliance, the technician will visit the client's home to fix the appliance.
Client	Technician	The client will open the AYOS Web application. The Client will post about his/her defective appliance. The customer has the option to select the technician they want to use to fix the appliance. Following the decision regarding which technician will fix the appliance, they can communicate via message about the defective	Following the conversation regarding the defective appliance, The customer will have to wait for the technician to visit their home and fix

		appliance.	the appliance. After the service is completed, the technician will now be paid by the client.

Table 2

Likert Scale Questionnaire

Questions (5-Highest, 1-Lowest)	1	2	3	4
Is the web application available to use anytime?				
Does the payment process run well without any issues?				
Does the security of the application properly protect the user's personal information as they input it?				
If a client has paid in advance and the technician abruptly announces that they have an emergency, does the system provide a refund feature?				
Does the client's posted request get removed from the "Service Request List" once the Technician has been selected?				
Will the technician's credentials be visible to clients as proof that they are qualified for the position?				
Is it possible for the client to make payments using a different method (such as Gcash, PayMaya, debit card, etc.)?				
Will users be able to send				

and receive messages to one another in real-time without any problems?			
Will the message-chatting feature become available only after the client selects the technician?			
Will users be able to login and sign up for the web application?			

EVALUATION PROCEDURE

Evaluation Instructions:

1. Assessment Form

All users who wish to try our web application will receive an assessment form to evaluate its effectiveness.

2. Application Demonstration

Use the demonstration feature to understand exactly how our web application functions.

3. Freemium Access

Under the freemium model, evaluators will have limited-time access to the application.

4. Evaluation Process

After using the freemium model, each evaluator must complete an individual evaluation form using a 5-point scale.

5. Rating Scale

The evaluation uses a 5-point scale with options ranging from "Fully Disagree" to "Fully Agree," including a neutral option and intermediate responses.

6. Ease of Use

This scale provides a straightforward and understandable way for respondents to share

their opinions.

  7. Assessment Results

  The results will be analyzed using a range of weighted mean values, as displayed in the

table below.

Table 3

  Four-point Likert Scale

Scale	Rating
4	Dissatisfied
3	Neutral
2	Satisfied
1	Very Satisfied

        The table shows a scale with numerical values. The scale goes from 1 to 4. The 4th

one is indicating "Dissatisfied," the 3rd one is "Neutral," the 2nd is "Satisfied," 1st and last

one is "Very Satisfied,". The table serves as a tool for assessing the acceptability values

denoting a more positive evaluation.

Chapter 4

RESULTS AND DISCUSSION

The results of the system evaluation are presented in this chapter. It additionally covers the venture description, structure, competencies, limitations, and assessment.

Project Description

The Adept and Yield Optimizing System (AYOS) is a full web platform designed to effectively connect customers with technicians for equipment repair services. The system allows technicians to receive and accept service requirements while allowing customers to choose technicians according to specific priorities, such as notes and opinions, to ensure the optimal service needs individual services.

The platform was developed using Visual Studio Code as an integrated development environment (IDE). The front-end was built using HTML, CSS, and ReactJS, while Node.js and Javascript developed the back-end. MongoDB Cloud acts as a database management system. To improve the features, the application combines a number of third-party APIs, including safe payment processing bands, push notifications to update in real-time, and Google cards to monitor positions. GitHub was used to control the versions and benchmark management, while the group's cooperation during development is mentioned through communication platforms such as Discord and Messenger.

The AYOS web application was designed with a user-focused interface to simplify the repair process. Customers may send concerns related to devices that technicians can respond to in a timely manner. The platform also allows technicians to promote their services by creating and sharing personalized marketing documents, such as leaflets,

posters and content of social media - through applications. This function supports technicians' awareness and professional presentation, facilitating an easier commitment to potential customers.

The technician has access to a part of the user's report, providing a detailed summary of their service history, including the total number of completed jobs and accumulated income. This allows technicians to effectively monitor and progress effectively. Customers can also check the history of their services, including information such as the names of the technicians who have repaired, the dates of service, and the corresponding service costs. This feature allows customers to maintain a complete recording of repair transactions and maintenance activities in the past. Security and the integrity of data are prioritized by implementing the user verification process. This mechanism is designed to prevent the use of fake identities and reduce the risk of criminal activities, thus creating a safe and reliable environment for customers and technicians.

The administrator's role includes the ability to manage user inspection to ensure the authenticity and reliability of all participants in the platform. In addition, administrators can monitor the system's overall performance thanks to detailed analysis, including the total income generated on the basis of monthly, annual, and annual sales. Administrators can also comply with the number of services required and the number of services that have been successfully completed, thus providing valuable information about the operation and general efficiency of the platform.

Project Structure

This section presents a complete review of the task via specified screenshots of the application. These visuals efficiently illustrate the interface, highlighting key factors and interactions. By analyzing those screenshots, readers can advantage treasured insights into the gadget`s layout ideas and logical workflow.

Figure 26

Home Page - Client & Guest
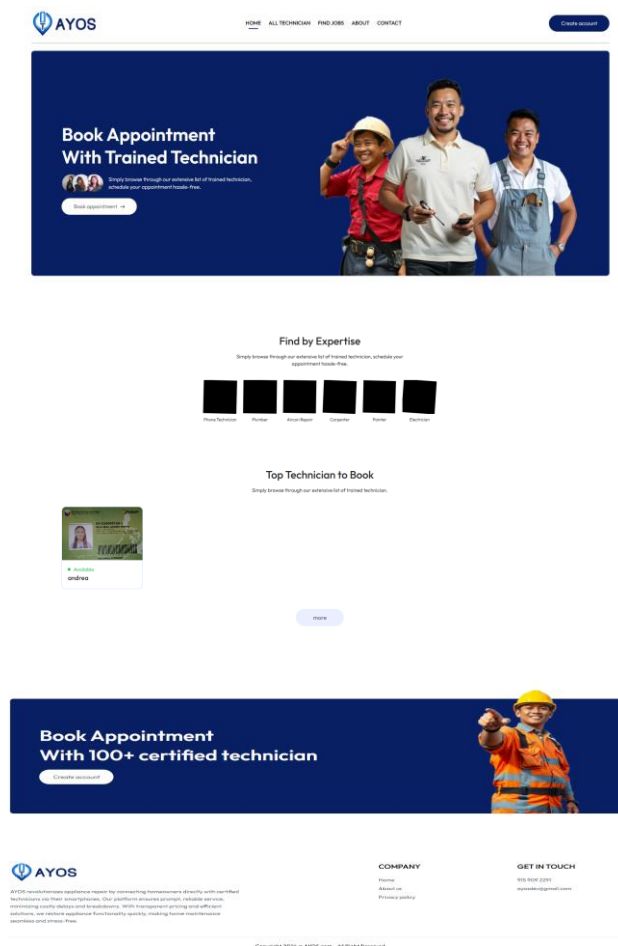
Figure 26 displays the homepage of a web-primarily based totally gadget named AYOS, showcasing a smooth and visually attractive interface. The web page prominently

features a banner encouraging customers to "Book Appointment with Trained Technician," observed via means of imagery of smiling technicians to instill acceptance as true with professionalism. Below the banner, the homepage affords alternatives to "Find via way of means of Expertise," allowing customers to browse via a labeled listing of educated professionals. The format emphasizes user-friendliness and green navigation, making sure a continuing experience for customers trying to schedule appointments.

Figure 27

All Technician - Client
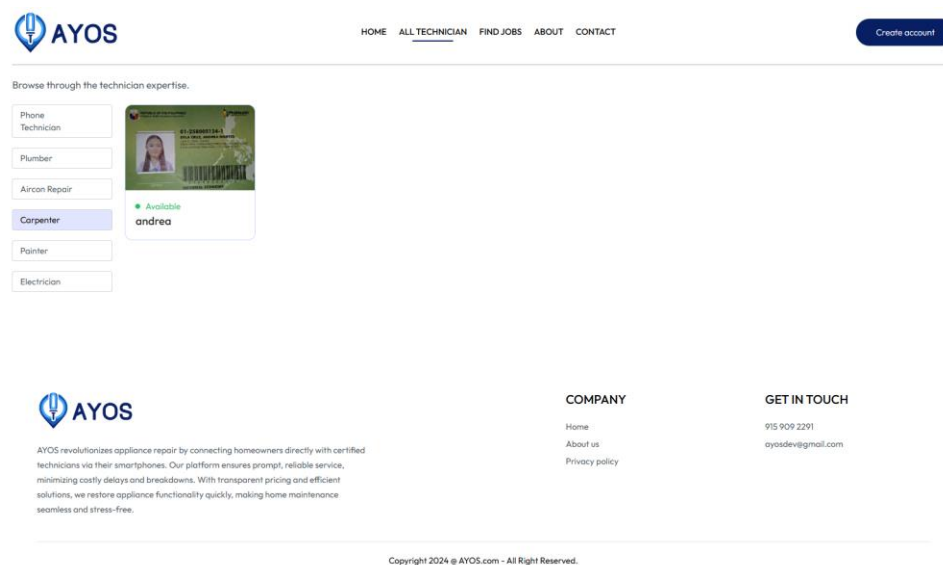
Figure 27 illustrates the All Technician stage of the online platform "AYOS," designed to link clients with skilled repair personnel. This stage features a straightforward design that clarifies the platform's purpose, emphasizing its mission to transform equipment repairs by bridging homeowners with qualified professionals. It additionally emphasizes clean pricing and brief fixes. Normally, this phase lists technicians and their

jobs, permitting customers to without problems locate and schedule the proper expert for their needs. Including corporation facts and phone information builds acceptance as true and makes it less difficult for customers to get the right of entry to the service.

Figure 28

About us - Client
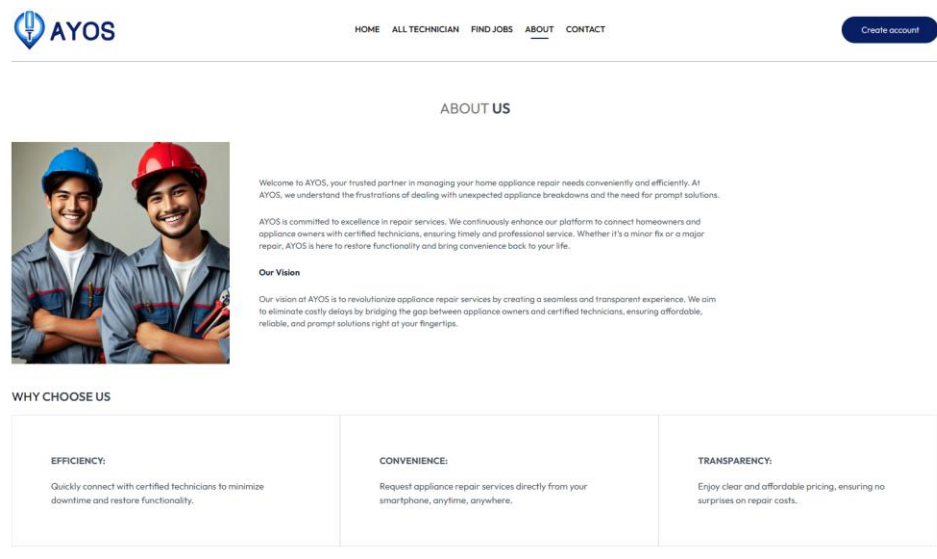
Figure 28 shows the About Us phase of the AYOS platform, giving a top-level view of the corporation`s dreams and principles. The phase consists of a pleasant greeting and a professional picture graph of a technician, stressing the platform`s promise to provide reliable and powerful equipment restoration services. It demonstrates AYOS's goal to change the repair process by effectively connecting homeowners with certified repair professionals, ensuring prompt, cost-effective, and skilled solutions. Additionally, this section outlines important benefits, such as effectiveness, user-friendliness, and transparency, highlighting the platform's focus on clients and its commitment to improving

customer contentment.

Figure 29

Contact - Client
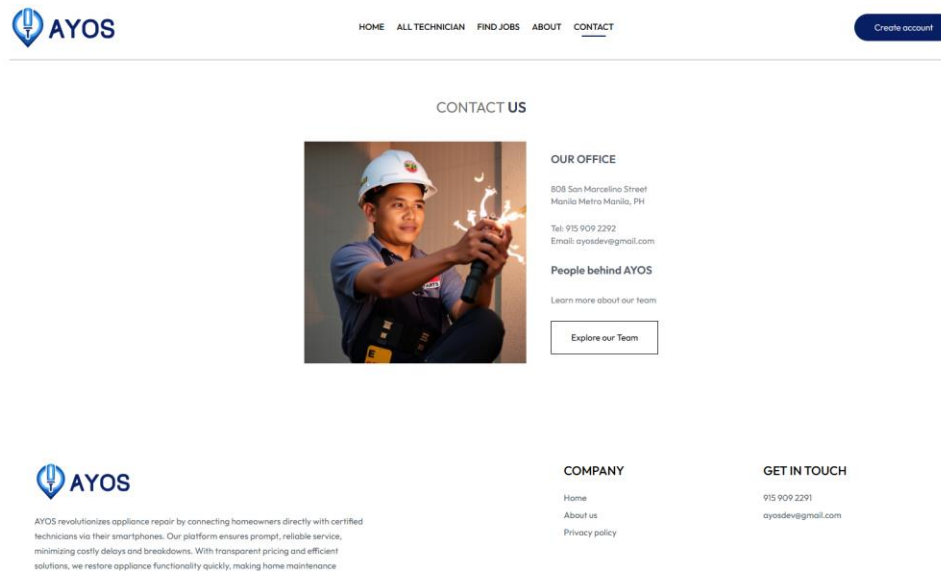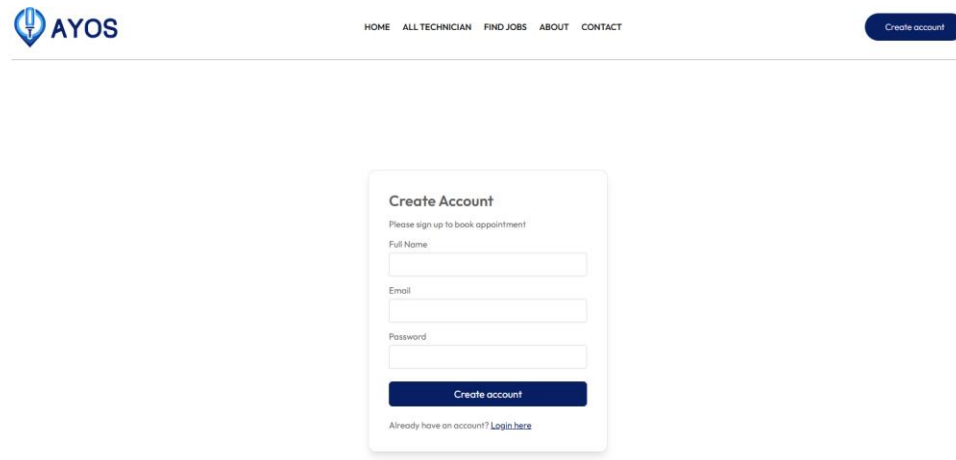
Figure 29 showcases the Contact Us section of the AYOS platform, offering vital information for users to reach out to the company. An image of a skilled technician is included, representing the platform's commitment to quality services. Contact information, such as the address, phone number, and email, is prominently presented for straightforward communication. In addition, a button that prompts action invites users to find out more about the AYOS team, fostering transparency and trust. The straightforward layout and simple ways to reach out make it easier for users to get help or inquire about the platform's services.

Figure 30

Create Account - Client
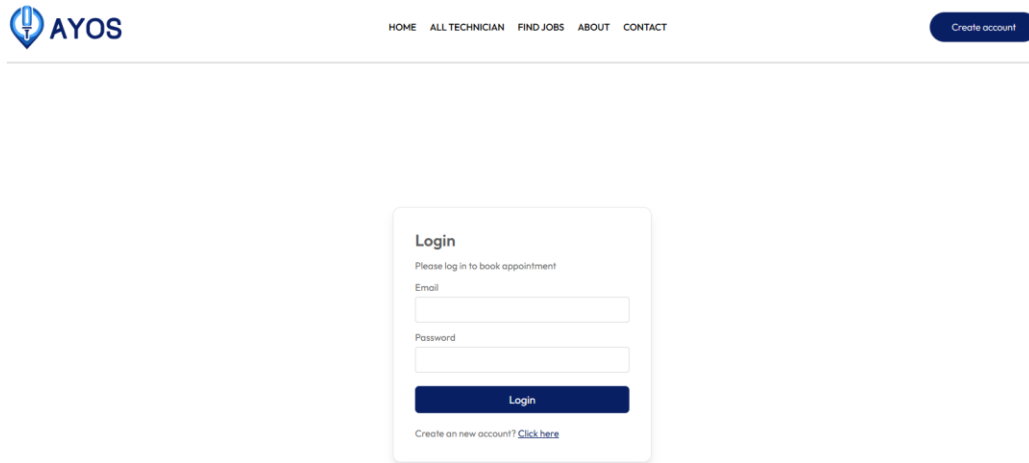
Figure 30 shows the area for creating an account on the AYOS platform, which allows users to sign up for scheduling appliance repair services. The page has a straightforward form design with fields for the user's full name, email, and password. A prominently displayed "Create Account" button is located beneath the form, encouraging users to take action. Moreover, a link can be clicked for those who already have an account, enhancing how users navigate the site. The tidy design supports usability and accessibility for everyone.

Figure 31

Login - Client

Figure 31 showcases the login screen of the AYOS system. This screen enables users to log into their accounts to schedule appointments with technicians. The login section contains areas to input an email address and password, and a "Login" button to facilitate authentication. Below this section is a link for individuals new to the platform to register for an account. The design of this interface is simple and user-oriented, allowing for smooth navigation. Furthermore, a "Create account" button is strategically positioned in the upper right corner, offering a straightforward option for new users to sign up.

Figure 32

Profile Information - Client
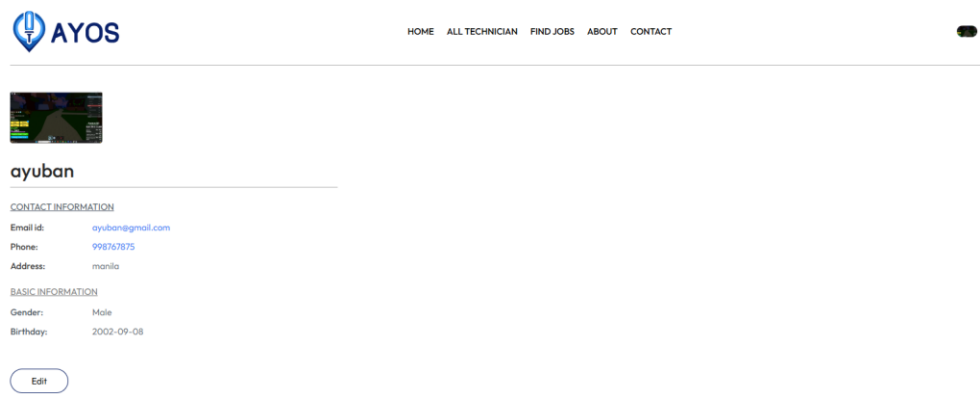
Figure 32 illustrates the User Information area of the AYOS platform, providing essential user data in a clear and simplistic layout. This part is segmented into sections that display contact information, such as email, telephone number, and home address. Additionally, there is a section for fundamental information such as gender and birth date, both of which are currently unselected. An "Edit" button is available for users wishing to modify their profile information. The navigation bar at the top facilitates quick movement to other sections, while the footer includes links related to the company and contact information, enhancing the interface's overall user experience and efficiency.

Figure 33

Appointment - Client

Figure 33 illustrates the place for scheduling appointments with a technician inside

the AYOS system. This feature allows customers to view the profile of a particular technician and continue to schedule a meeting. The photo presents critical information about the technician, together with their name, expertise (like carpentry), years of experience, carrier charges, and a pro ID for verification. Below the technician`s details, the available reserving instances are listed, permitting customers to pick a convenient date and time for the carrier. A "Book an Appointment" button facilitates it without problems, confirming the chosen time. The interface also functions as a "Related Technician" section, supplying customers with alternatives to discover extra professional professionals. This setup guarantees a straightforward and effective booking experience, improving the overall client journey.

Figure 34

Login - Admin
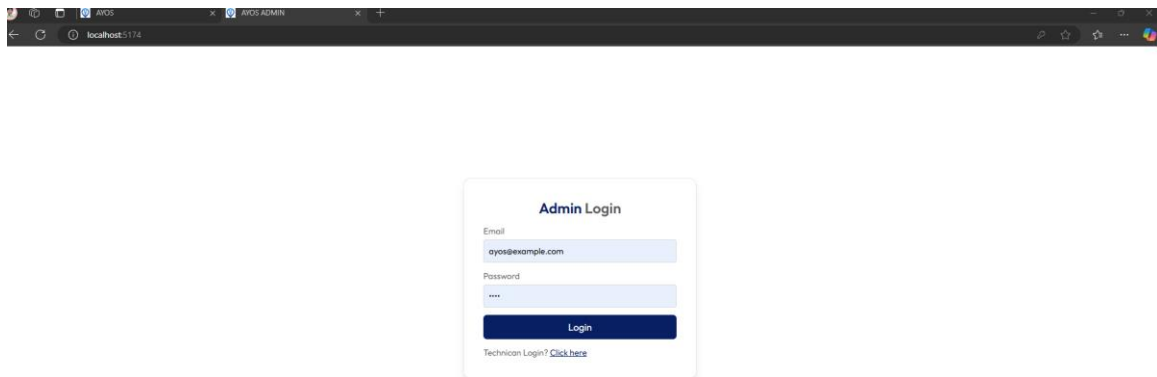
Figure 34 presents the Admin Login section of the AYOS platform, showcasing a straightforward and accessible design. It features an email and password entry form for administrators and a link for technicians to reach their login area. The design emphasizes

clarity and ease of use for a smooth login procedure.
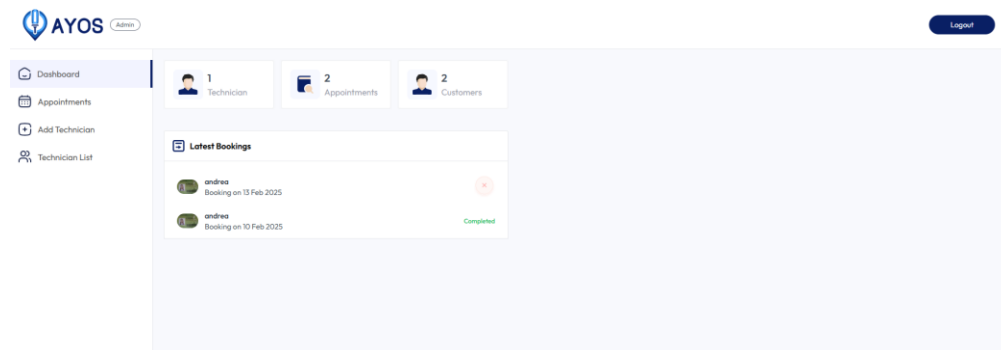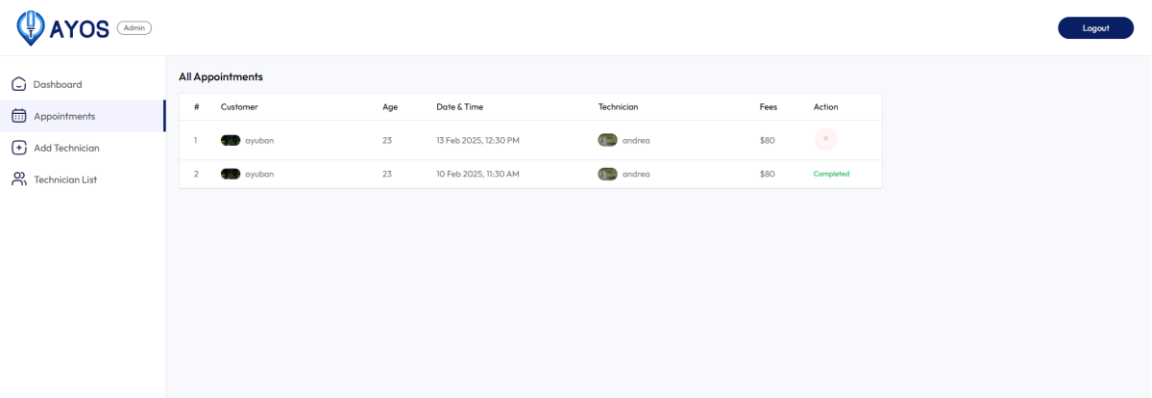
Figure 35

Dashboard - Admin

Figure 35 shows the management dashboard for the AYOS platform, where a user-friendly and optimized interface for effective system management is generated. On the left side, the sidebar provides quick access to critical areas such as dashboards, appointments, technicians, and technician lists. This deployment allows administrators to achieve essential features easily and with little or no problem. At the center of the dashboard, key metrics are clearly presented, such as technicians, appointments, and number of customers, which provide a brief overview of the system's company status. Additionally, the dashboard has a section entitled "Latest Bookings." This is likely displayed by a current appointment or service inquiry and will help administrators provide information about current activities. The interface combines user-friendly and practical capabilities to enable efficient task management, but the performance of the system remains a clear view. of the system's performance.

Figure 36

Appointment - Admin
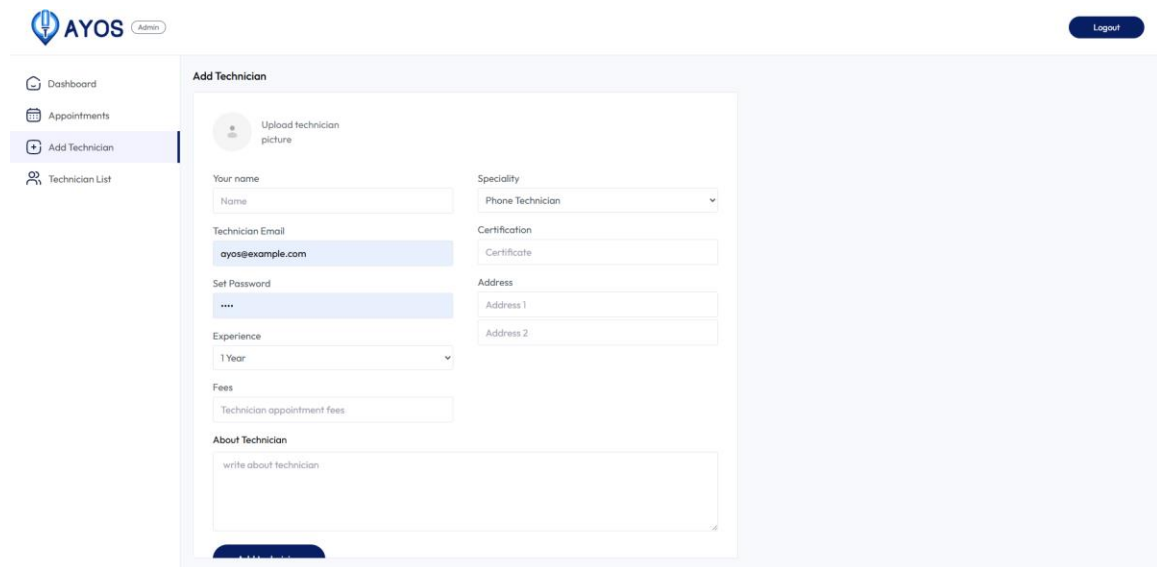
Figure 36 shows the segments of the scheduled AYOS Management Dashboard and provides a detailed table for monitoring all date files. This table is organized to present important information such as the customer, technician, associated fees, the names of actions available for each appointment, age, appointments, and times. The aim is to enable effective management and monitoring of schedules. The left sidebar navigation includes links to other important sections such as "Dashboard", "Add Technicians", and "Technician List", so administrators can easily toggle between different features. This design prioritizes straight organizations and ensures a systematic approach to managing service bookings.

Figure 37

Add technician - Admin

Figure 37 shows the ADD technician segment of the AYOS administrator Dashboard to systematically and effectively simplify the integration of new technicians. This feature provides a detailed form that allows administrators to enter all the important information about technicians. The application has several sections, beginning with choices, and allows Users to upload a picture of the technician that will assist in quick identification and include clear details. It also gathers essential details like the technician's name, email address, and strong passwords for system access. Additionally, this form allows administrators, technician experience, service fees, and expertise to show that orders are properly assigned according to their skills through drop-down lists of specialties such as "telephone technician". To increase reliability and confidence, the form has a section that documents certifications, and the address field can contain location or workplace location information. Furthermore, the About Technician area allows administrators to

input details regarding technicians, such as their approaches and notable accomplishments. This comprehensive and intuitive format ensures that technology-related information remains orderly and structured, facilitating order management, performance monitoring, and appropriate maintenance. In summary, the "Add Technician" feature is a crucial element of the AYOS administrator onboarding process, assisting businesses in efficiently recruiting qualified technicians while simultaneously maintaining an orderly database.

Figure 38

Technician List - Admin
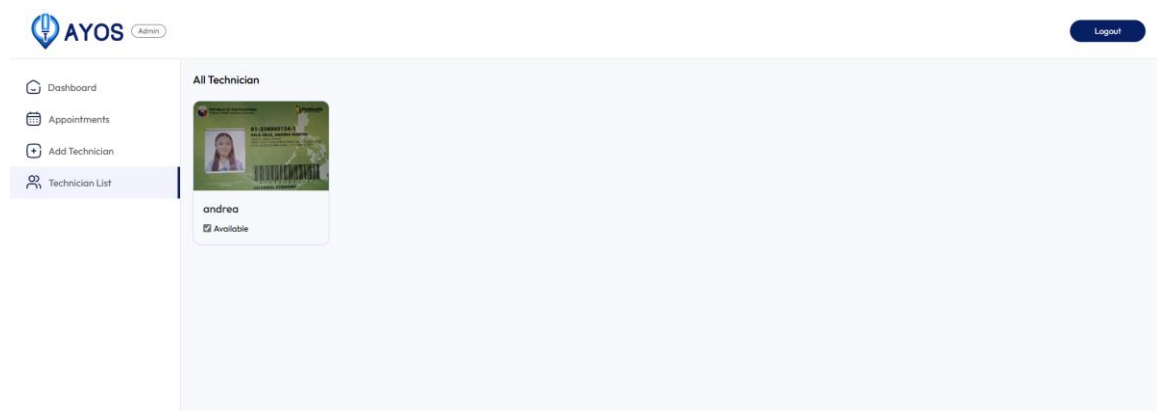
Figure 38 shows the list of technicians for the AYOS Administrator Dashboard, giving a clear overview of each technician registered in the system. This feature showcases a profile for every technician, including relevant information such as their name, field of expertise, availability, and other details. Each technician's profile card has pictures that contribute a personal touch and assist with recognition. The field of expertise, like "pediatrician," allows admins to quickly find and assign technicians based on the specific skills required for particular tasks or appointments. The "available" status indicator ensures that the administrator is identifying who is currently active and preparing for an

assignment.

This organized form increases the effectiveness of technician management and supports rapid decision-making in task assignment. Additionally, this design ensures that essential information is easily accessible without overflowing the user with extra details. This feature is important for maintaining a well-structured technician database and improving operational workflows within AYOS systems.

Figure 39

Technician - Login
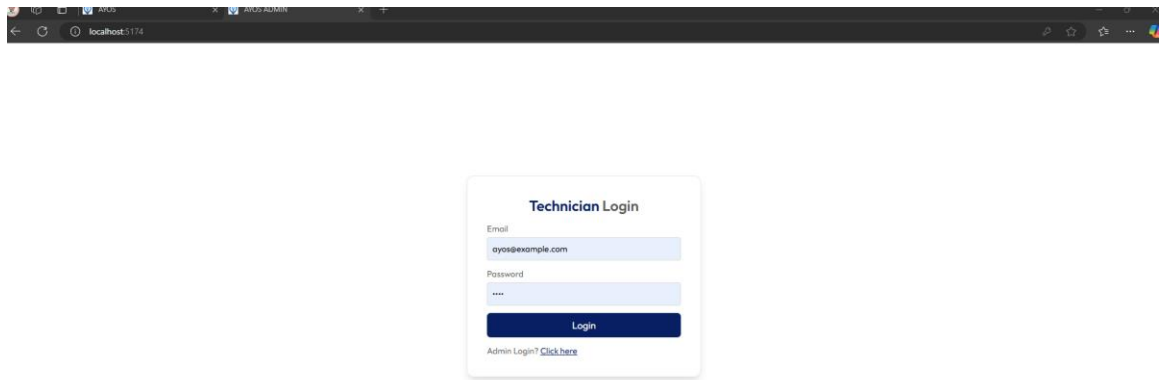
Figure 39 is the Technician Login page, a minimalist and dedicated authentication site for technicians to log in to their accounts in the AYOS system. This webpage is laid out with an email and password field so that every user can safely input their email and password and personally access their account.

Figure 40

Dashboard - Technician
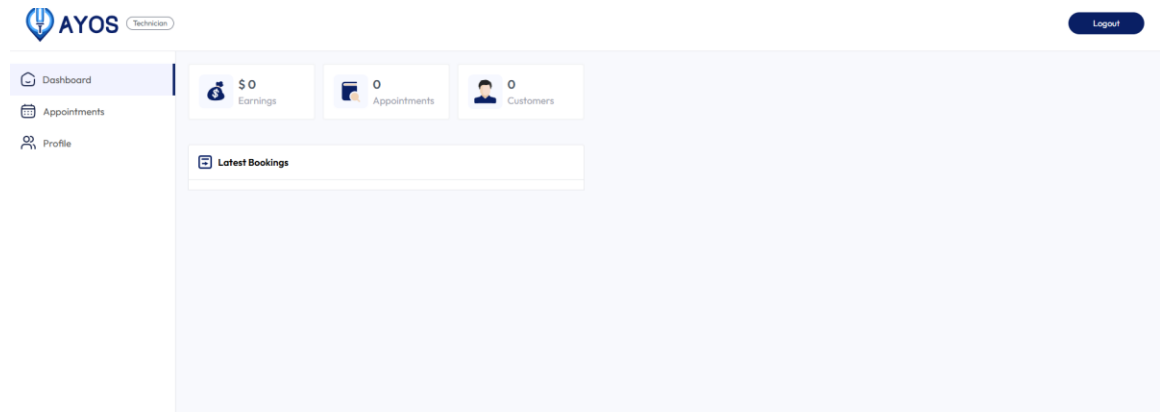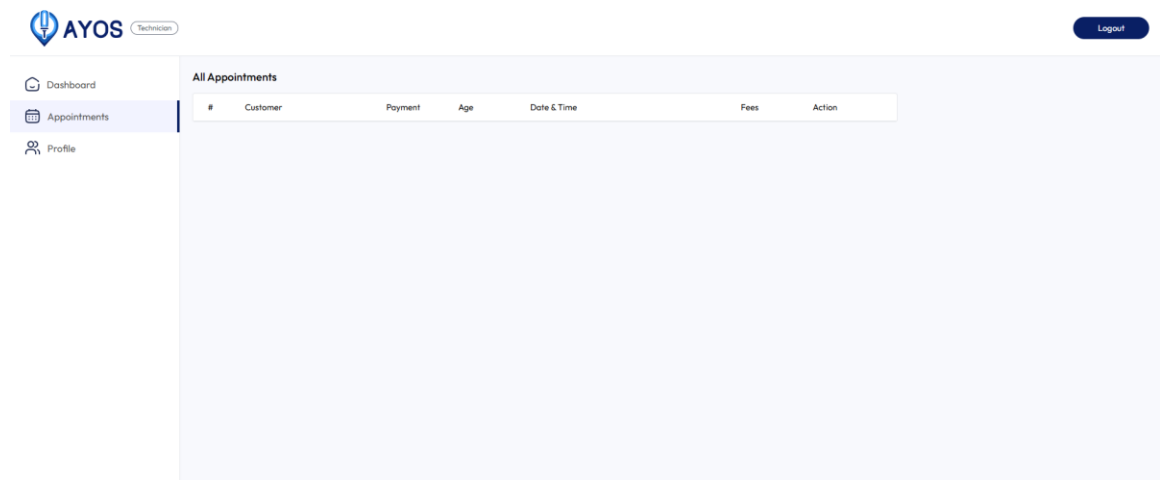
Figure 40 displays the dashboard for technicians within the AYOS system, which offers three functionalities: Dashboard, Appointments, and Profile.

Additionally, the latest page allows the technicians to easily look at their recent appointments, stay up to date, and prepare for responsibility. The left navigation menu offers options to access dashboards, appointments, and profiles, making navigating the system easier.

Figure 41

Appointments - Technician

Figure 41 shows the technician's viewpoint in the AYOS scheme, with focus on the

Appointments section, in which scheduled customer visits are presented in tabular format.

The page has important data such as the customer's name or ID, payment status or amount,

age, appointment date and time, applicable service fee, and a column with buttons or links

used in handling the appointments. The clean design is easy to understand, enabling

technicians to efficiently manage their schedules while maintaining a professional working

view.

Figure 42

Profile - Technician
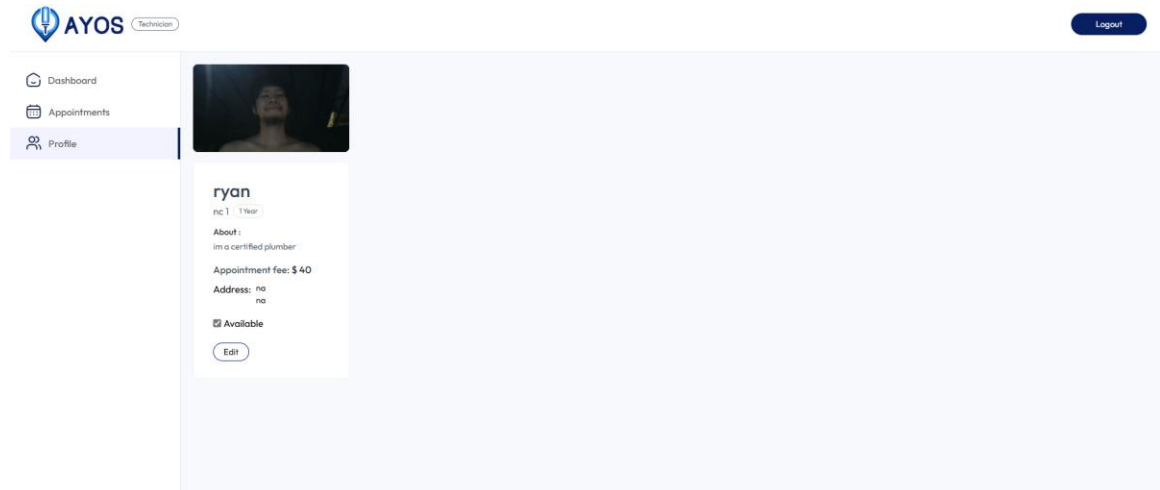
Figure 42 showcases the Technician - Profile Details section within the AYOS system. This part allows technicians to handle and refresh their professional and personal data for upcoming client interactions. The visual representation shows a user interface that contains important information about the engineer. B. Its name, specialization (for example, the interface indicates a professional identification or certification card to improve trust. The availability status is characterized by a checkbox, which makes it clear to the customer whether the technician accepts a new reservation. A process button is included to allow for a simple update of the information.

Project Test Results

This section presents the data gathered during the system's testing in terms of capability and reliability. The project's evaluation findings are also shown and discussed.

Capability Test Results

The developed system was evaluated based on its capabilities to perform intended functions under specified conditions. The capability testing involved various test scenarios covering core features and functions across different user types. Table 4 presents the summarized capability test cases distributed per user category in the system.

Table 4

Overall Summary of Capability Test Cases

User Type	No. of Test Cases
General User	35
Administrative User	50
System Maintainer	25
Total	**110**

The capability test was performed in two cycles. Table 11 shows the execution summary, including expected vs. actual results, and the corresponding pass/fail rates for each test cycle. On the first cycle, 90% of the test cases passed, while 10% failed and required retesting. These issues were resolved, and on the second cycle, all test cases passed, confirming that the system met its intended capability requirements. Complete

details of test case procedures are found in Appendix D, and initial failed test cases are listed in Appendix F.

Table 5

Capability Test Execution Summary

Test Execution Summary	Expected Result	Actual Result Cycle 1	Actual Result Cycle 2
No. of Test Cases Executed	100%	100%	100%
PASSED	100%	90%	100%
FAILED	0%	10%	0%
No. of Test Cases Not Executed	0%	0%	0%

This summary shows that the system successfully fulfilled its intended function after the first cycle. Subsequent rounds of evaluation validated the full functionality and reliability of each component.

Reliability Test Results

In Table 6, the system was evaluated to ensure reliability to ensure constant performance

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within specific conditions over several iterations. This includes checking the robustness of

critical processes, such as user registration, data management, and feature responsiveness.

Table 6 provides an overview of the test scenarios and their respective reliability goals.

Table 6

Reliability Test Cases Summary

Test Code	Reliability Objective
SYS-REL-001	To ensure that the system consistently handles user authentication and access management.
SYS-REL-002	To ensure that the system reliably processes user-submitted data across different sessions
SYS-REL-003	To ensure that the dashboard loads and updates accurately under multiple scenarios.
SYS-REL-004	To ensure that the system will show real-time features performed without interruption or data loss.
SYS-REL-005	To ensure that notifications and alerts function as expected in all test conditions.
SYS-REL-006	To ensure that the system retains session states during prolonged usage.
SYS-REL-007	To ensure that the database connections remain stable across simultaneous user access.
SYS-REL-008	To ensure that the system will have reliable performance during failed network scenarios and recovery attempts.
SYS-REL-009	To ensure consistent file upload/ download functionality.
SYS-REL-010	To ensure that the system will have data integrity in records across multiple edits and saves.

The table provides a list of use cases relating to system functionality and

management.

Each use case has a unique test code, and the "Reliability objectives" column

describes the objectives or goals connected with each use case. The above use cases reflect the system's core operations that were repeatedly tested to validate their long-term performance, responsiveness, and error-handling capacity. The table is used as a reference to check that the system has been extensively tested and meets the standards given for each use case.

Table 7

Reliability Test Execution Summary

Test Execution Summary	Expected Result	Actual Result Cycle 1	Actual Result Cycle 2
No. of Test Cases Executed	100%	100%	100%
PASSED	100%	70%	100%
FAILED	0%	30%	0%
No. of Test Cases not executed	0%	0%	0%

The table shows a summary of test execution for two testing cycles. During the first cycle of testing, 70% of the reliability test cases passed, while 30% failed due to minor stability issues such as inconsistent session handling and delayed dashboard responses. These concerns were addressed and rectified before proceeding with a second cycle of testing, in which all test cases passed, confirming the system's improved reliability and readiness for deployment. The table provides an overview of the test execution progress

and test case success rate.

Project Capabilities and Limitations

The developed system has the following capabilities:

1. The system provides a centralized and streamlined platform for AYOS designed to improve workflow and user experience for online consumers.

2. It supports user authentication and role-based access, ensuring that each user type (e.g., Admin, Registered User, Guest) has access to the appropriate features and functions.

3. The system allows real-time data processing and interactive modules for efficient user transactions or submissions.

4. It enables users to manage personal accounts, update profile information, and track their activity within the system.

5. Administrative users have access to dashboard features for managing users, viewing reports, and monitoring system usage.

6. The system includes notification functionality to alert users regarding important updates or changes related to their account or submitted data.

7. Responsive design principles are applied, making the system accessible on both desktop and mobile browsers for broader usability.

8. Implementation of data validation, input error handling, and confirmation prompts to minimize mistakes during user interactions.

9. All user inputs and records are stored in a secure database with data encryption and backup procedures in place.

However, the system has the following **limitations**:

1. The system is only accessible via web browsers and requires a stable internet connection; offline use is currently not supported.

2. Integration with third-party services (e.g., external delivery platforms, cloud-based tools, or APIs) has not yet been implemented and must be handled separately if needed.

3. File uploads, media previews, or data exports may be limited to specific formats depending on the feature.

4. User roles and permissions are predefined; advanced customization or dynamic role creation is not included in the current scope.

5. Performance may vary depending on browser type and device specifications, with optimal use recommended on modern browsers (e.g., Chrome, Firefox).

6. Real-time features like chat or instant notifications may have latency based on server response time and internet speed.

7. The current version does not include multilingual support or accessibility features for users with disabilities.

8. System maintenance and updates must be done manually by the administrator or developer.

These capabilities and limitations reflect the current development phase of the project and can be enhanced in future versions based on user feedback, additional funding, or evolving system requirements.

Project Evaluation

The developed system was evaluated by a total of ten (10) IT Students, ten (10) Online Consumers, five (5) Virtual Assistants, and five (5) Housewives, from a total of thirty (30) respondents. The evaluation was conducted based on two quality characteristics defined under the ISO/IEC 25010 software quality model: Capability and Reliability. The results of the evaluation yielded an overall weighted mean of 3.52, which falls within the scale range of 3.26 – 4.00, interpreted as Highly Acceptable.

Table 8

Capability Evaluation Result

Criteria	Weighted Mean	Descriptive Rating
Task Completion	3.45	Highly Acceptable
Efficiency on Operations	3.58	Highly Acceptable
Accuracy of Outputs	3.66	Highly Acceptable
Overall Weighted Mean	**3.56**	**Highly Acceptable**

As shown in Table 8, the Task Completion criterion received a weighted mean

of 3.45, which indicates that the system successfully allows users to accomplish intended tasks such as customizing, saving, and editing product designs. The Efficiency of Operations criterion received a 3.58 rating, showing that the system streamlines user interaction with responsive features and intuitive workflows. Meanwhile, the Accuracy of Outputs gained a 3.66 rating, suggesting that the system produces consistent and precise results, particularly in handling orders, generating quotations, and saving user designs. These results reflect that the system is Highly Acceptable in terms of overall Capability.

Table 9

Reliability Evaluation Result

Criteria	Weighted Mean	Descriptive Rating
Maturity	3.62	Highly Acceptable
Availability	3.34	Highly Acceptable
Fault Tolerance	3.50	Highly Acceptable
Recoverability	3.21	Very Acceptable
Overall Weighted Mean	**3.56**	**Highly Acceptable**

Table 9 shows the system's Reliability results. The system scored 3.62 for Maturity, which indicates that it performs consistently without failures under normal usage conditions. In terms of Availability, it received a 3.34, reflecting that the system remains functional and accessible during operation. The Fault Tolerance rating of 3.50 implies that the system is capable of handling unexpected issues without major disruptions. For Recoverability, the system was rated 3.21 and categorized as Very Acceptable, meaning it can restore lost data or operations after a fault or interruption, although with minor limitations.

Table 10

Software Evaluation Results Summary

Criteria	Weighted Mean	Descriptive Rating
Capability	3.56	Highly Acceptable
Reliability	3.42	Highly Acceptable
Overall Mean	**3.52**	**Highly Acceptable**

As summarized in Table 3, the system received an overall weighted mean of 3.52, which is interpreted as Highly Acceptable. This demonstrates that the system has effectively satisfied the essential quality standards for Capability and Reliability based on the ISO/IEC 25010 model. These results affirm the system's ability to perform its functions accurately and dependably, making it suitable for real-world use.

Chapter 5

SUMMARY OF FINDINGS, CONCLUSIONS, RECOMMENDATIONS

This chapter provides a summary of the key findings, draws conclusions from the results of the system's testing and evaluation, and offers recommendations based on those outcomes.

Summary of Findings

The Adept Yield Optimizing System (AYOS) is a web-based application that intends to connect consumers in need of appliance repair services and technicians looking for work. For consumers, AYOS makes it easy to find technicians who have the specific knowledge of how to repair the appliance with the problem. For providers, AYOS helps optimize their skills and knowledge by pulling repair requests that match their skills. By simplifying the process of matching repair requests with certified technicians, there is an increase in the speed of appliance repairs and an enhancement of the livelihood of certified technicians.

Evaluation findings confirm that AYOS is a reliable and effective application for both user groups; system testing indicated (option to include a "number" or not here) of reliability where accuracy, availability, fault tolerance, and recovery were all rated "Highly Acceptable". As such, findings indicate that the system meets and exceeds user expectations and achieves the functional performance and ability deemed essential in its development.

Conclusions

The following conclusions were drawn from the study's findings:

The Adept and Yield Optimizing System (AYOS) is an innovative solution created to meet the growing needs of both appliance owners and skilled technicians in the Philippines. As households increasingly rely on complex electronic appliances, the need for dependable, efficient, and cost-effective repair services continues to rise. Unfortunately, the current repair service setup often leaves consumers with limited options for finding qualified professionals. At the same time, TESDA-certified technicians face difficulties in reaching potential clients. AYOS aims to close this gap by providing a platform that connects both sides effectively.

AYOS makes it easier for people to locate and hire reliable local technicians. The website is easy to use. Users can search for services in your area, see prices instantly, send messages, pay securely, and see if the technician has a TESDA certificate. Users will most likely find everything that is more convenient and clear as a result. Additionally, it helps technicians find jobs that will help them advance their careers.

A flexible approach to software development was used to create the AYOS Web App, allowing it to be more user-friendly. It creates trust between the system and the technicians by connecting the TESDA system to verify technicians' certificates. To ensure that users have a good experience.

AYOS promotes the clients' sustainability by encouraging the repair and reuse of clients ' appliances, reducing electronic waste, and adopting an environmentally friendly

approach. AYOS also aligns with TESDA's goals by matching training programs with job market needs in society, helping to expand the job opportunities for technicians.

AYOS is not just a web-based application, and it is also a tool that promotes the enhancement of appliance repair in the Philippines.

This project highlights the innovation that plays a role in solving today's challenges and serves as a model for the future, focusing on improving lives through technology.

Recommendations

Based on testing and evaluation of the system, the following recommendations are proposed to continue to define the space of the Adept and Yield Optimizing System (AYOS) in terms of operations, reliability, and user impacts:

1. Regularly assess the performance of the system, and while doing so, release timely software updates to maintain operational readiness, security, efficiency, and responsiveness to changing user needs.

2. Enhance interfaces with the Technical Education and Skills Development Authority (TESDA) by allowing for real-time certification validation and access to original training materials for the technicians.

3. Develop and set up separate dedicated apps for Android and iOS systems for overall accessibility for all users.

4. Integrate an intelligence-based matching algorithm to allow users to be connected to technicians based on geographic location, areas of specialization, user ratings, and technician availability.

5. Develop and initiate a focused marketing campaign in conjunction with TESDA and local organizations to enhance awareness and usage of the platform.

6. Expand payment flexibility through additional secure payment options such as electronic wallets and cash on delivery.

7. Establish a responsive customer support system with live chats and proactive email responses for customer inquiries.

8. Create a consistent user feedback procedure that can capture, review, and utilize user feedback in the ongoing iteration or evolution of the system.

9. Strengthen the security and privacy of all data by adhering to the Data Privacy Act of 2012, conducting regular security audits, and adhering to standards in data encryption.

10. Advance eco-friendly practices by incentivizing clients who decide to repair an appliance rather than replace it and working with environmental organizations.

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AYOS: Web-Based App for Appliance Repair Services

Appendix A

Sample Evaluation

Adept and Yield Optimizing System: Web-Based-App for Appliance Repair Services
(AYOS)

Software Evaluation Ratings: ISO 25010

Name:

Instruction: Please evaluate the software material by using the provided rating scale.
Indicate your evaluation by placing a checkmark (✓) under the number that best reflects
your rating.

Numerical Rating and Equivalent

4 – Very Satisfied   3 – Satisfied   2 – Neutral   1 – Dissatisfied

Questions (5-Highest, 1-Lowest)	1	2	3	4
Is the web application available to use anytime?				
Does the payment process run well without any issues?				
Does the security of the application properly protect the user's personal information as they input it?				
If a client has paid in advance and the technician abruptly announces that they have an emergency, does the system provide a refund feature?				

Does the client's posted request get removed from the "Service Request List" once the Technician has been selected?				
Will the technician's credentials be visible to clients as proof that they are qualified for the position?				
Is it possible for the client to make payments using a different method (such as Gcash, PayMaya, debit card, etc.)?				
Will users be able to send and receive messages to one another in real-time without any problems?				
Will the message-chatting feature become available only after the client selects the technician?				
Will users be able to login and sign up for the web application?				

Appendix B

Survey Questionnaire and Results Form

Section 2 of 3

Effect of Web-Based-Application for Appliance Repair Services (AYOS)

Description (optional)

How satisfied are you with our Web-application?

○ Very Satisfied

○ Satisfied

○ Neutral

○ Dissatisfied

Is the Web-Application available to use anytime?

○ Very Satisfied

○ Satisfied

○ Neutral

○ Dissatisfied

Will users be able to login and signup for the Web-Application?

Section 2 of 3

Effect of Web-Based-Application for Appliance Repair Services (AYOS)

Description (optional)

How satisfied are you with our Web-application?

○ Very Satisfied

○ Satisfied

○ Neutral

○ Dissatisfied

Is the Web-Application available to use anytime?

○ Very Satisfied

○ Satisfied

○ Neutral

○ Dissatisfied

Will users be able to login and signup for the Web-Application?

Will users be able to login and signup for the Web-Application?

○ Very Satisfied

○ Satisfied

○ Neutral

○ Dissatisfied

:::

Does the security of the Web-Application properly protect the user's personal information as they input it?

○ Very Satisfied

○ Satisfied

○ Neutral

○ Dissatisfied

If a client has paid in advance and the technician abruptly announces that they have an emergency, does the system provide a refund feature?

○ Very Satisfied

○ Satisfied

○ Neutral

○ Dissatisfied

Will users be able to login and signup for the Web-Application?

○ Very Satisfied

○ Satisfied

○ Neutral

○ Dissatisfied

Does the security of the Web-Application properly protect the user's personal information as they input it?

○ Very Satisfied

○ Satisfied

○ Neutral

○ Dissatisfied

If a client has paid in advance and the technician abruptly announces that they have an emergency, does the system provide a refund feature?

○ Very Satisfied

○ Satisfied

○ Neutral

○ Dissatisfied

Does the client's posted request get removed from the "Service Request List" once the technician has been selected?

○ Very Satisfied

○ Satisfied

○ Neutral

○ Dissatisfied

⠿

Will the technician's credentials be visible to clients as proof that they are qualified for the position?

○ Very Satisfied

○ Satisfied

○ Neutral

○ Dissatisfied

Is it possible for the client to make payments using a different method (such as Gcash, Paymaya, Debit Card, etc.)

○ Very Satisfied

○ Satisfied

○ Neutral

○ Dissatisfied

Does the payment process run well without any issue?

○ Very Satisfied

○ Satisfied

○ Neutral

○ Dissatisfied

⋮⋮⋮

Will user be able to send and receive messages to one another in real-te without any problem?

○ Very Satisfied

○ Satisfied

○ Neutral

○ Dissatisfied

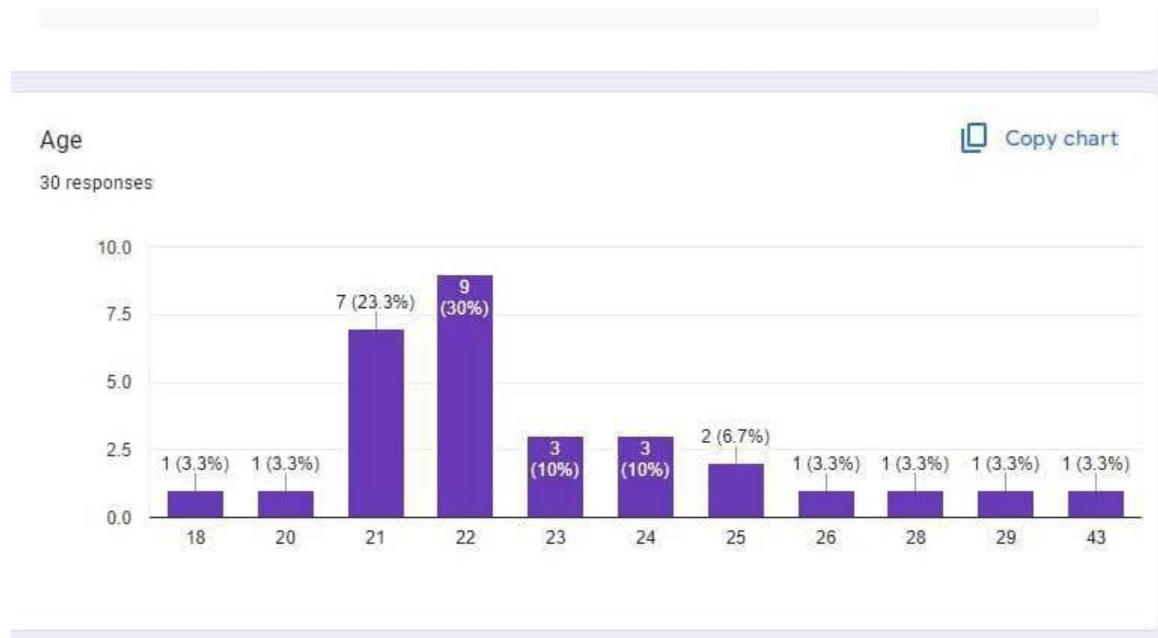After section 2   Go to section 3 (Thank you for taki...mment down below.)   ▾

Section 3 of 3

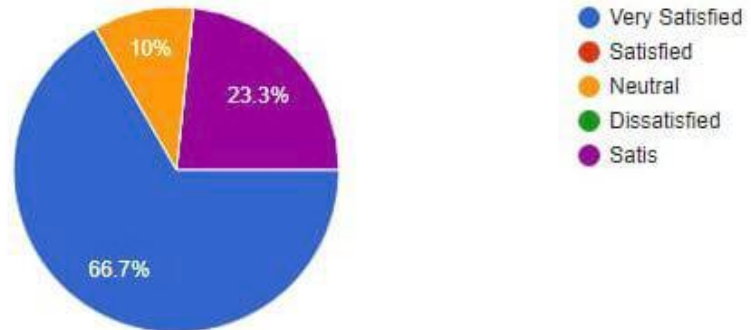Thank you for taking the time to complete this survey. If you have suggestion just comment down below.

Description (optional)

How satisfied are you with our Web-application?

30 responses

- Very Satisfied
- Satisfied
- Neutral
- Dissatisfied
- Satis

10%
23.3%
66.7%

Is the Web-Application available to use anytime?

30 responses
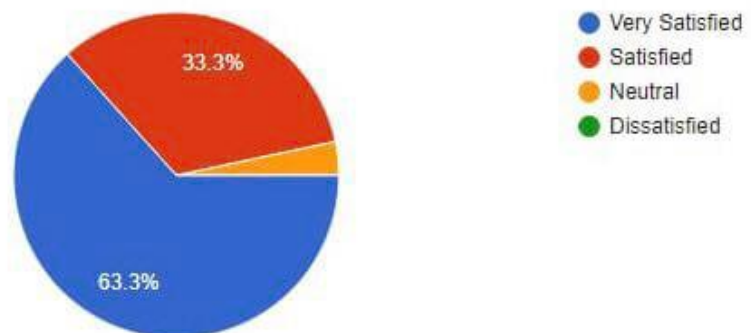
- Very Satisfied
- Satisfied
- Neutral
- Dissatisfied

33.3%
63.3%

Will users be able to login and signup for the Web-Application?

30 responses

- Very Satisfied
- Satisfied
- Neutral
- Dissatisfied
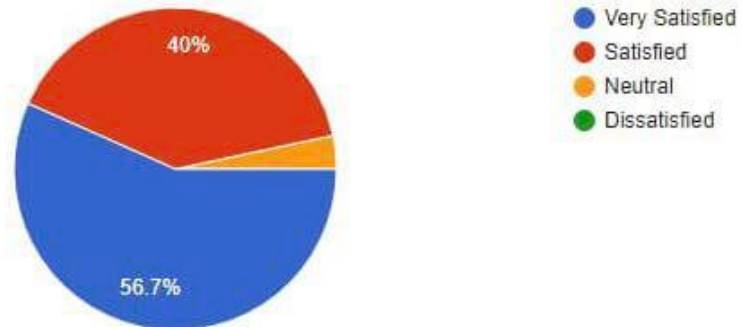
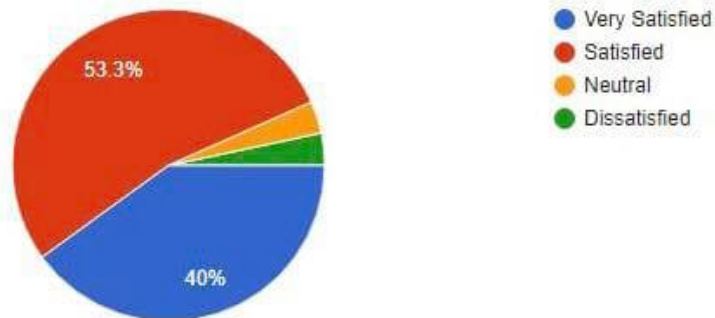Does the security of the Web-Application properly protect the user's personal information as they input it?

30 responses
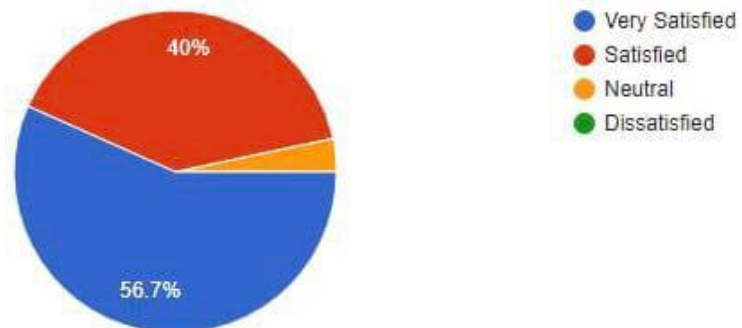
- Very Satisfied
- Satisfied
- Neutral
- Dissatisfied

If a client has paid in advance and the technician abruptly announces that they have an emergency, does the system provide a refund feature?
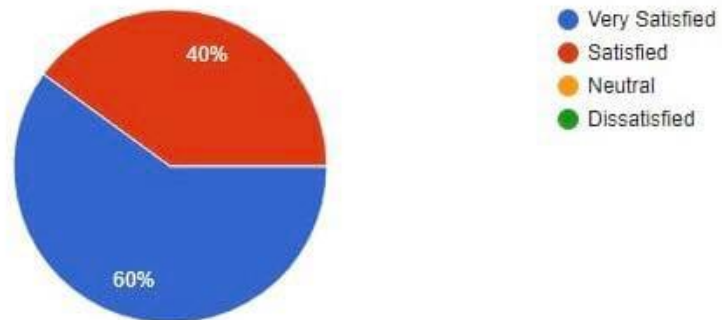
30 responses

Does the client's posted request get removed from the "Service Request List" once the technician has been selected?
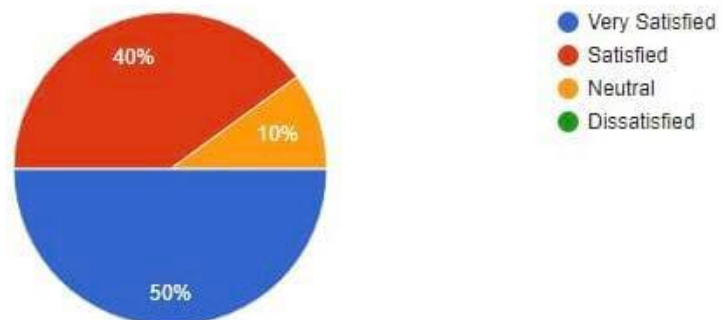
29 responses

Will the technician's credentials be visible to clients as proof that they are qualified for the position?

30 responses

Is it possible for the client to make payments using a different method (such as Gcash, Paymaya, Debit Card, etc.)
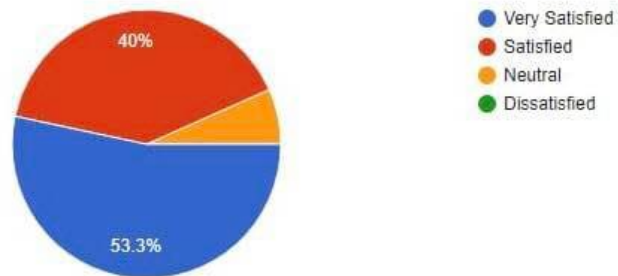
30 responses

Does the payment process run well without any issue?

Copy chart

30 responses

- Very Satisfied
- Satisfied
- Neutral
- Dissatisfied

40%

53.3%

Will user be able to send and receive messages to one another in real-te without any problem?

Copy chart

30 responses

- Very Satisfied
- Satisfied
- Neutral
- Dissatisfied

43.3%

53.3%
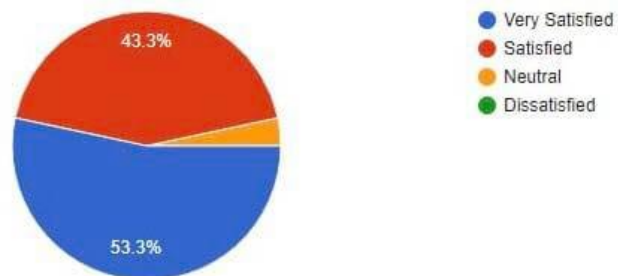
Thank you for taking the time to complete this survey. If you have suggestion just comment down below.

Appendix C

Profile of Respondents

Respondents No.	Name	Profession
1	Jeric Dasmarinas	Student
2	James Bisco	Factory Work
3	Rico Arman Lendio	Food Delivery
4	Ronniel Dave Gregorio	Student
5	Mikhail	Nurse
6	Bernard Cerezo	Food Delivery
7	Robert Allen	Student
8	Ralf	Student
9	Michael	Student
10	Ivan Groyon	Crew
11	John Glenn	Student
12	Cathrina Leigh	Architect
13	Nerie Santillan	Seaman
14	Joek Ingreso	Police
15	Reignson Javier	Call Center
16	Ace	Finance
17	Paul	Student
18	John Rey	Programmer
19	David	Student
20	Jerson Bisco	Police
21	George	Student
22	Bogart	Crew
23	Mark Jason	Student
24	Clark	Government
25	Jumi	I.T Professional
26	Simon Arilla	Student
27	Pebbe Valiente	Crew
28	Cristina	Housewife
29	John	Student
30	Neil Domingo	Teacher

Appendix D

Thesis Grammarian Certification

	TECHNOLOGICAL UNIVERSITY OF THE PHILIPPINES Ayala Blvd., Ermita, Manila, 1000, Philippines Tel No. +632-5301-3001 local 608| Fax No. +632-8521-4063 Email: cos@tup.edu.ph	Website: www.tup.edu.ph	Index No.	REF-COS-3 5-INT-TGC
		Revision No	00
		Effectivity Date	06132022
VAA-COS	THESIS GRAMMARIAN CERTIFICATION	Page	1 / 1

THESIS GRAMMARIAN CERTIFICATION

This is to certify that the master thesis entitled,

**ADEPT AND YIELD OPTIMIZING SYSTEM: WEB-BASED-APP
FOR APPLIANCE REPAIR SERVICES (AYOS)**

authored by

**Ryan M. Dela Cruz
Ralf Gabriel Ayuban
Michael Vincent Martin
Marcos Darwin Tulalian**

has undergone editing and proofreading by the undersigned.

This Certification is being issued upon the request
for whatever purposes it may serve them.

Asso. Prof. JENNIFER P. ALINSUNOD, CHRA, LPT
Grammarian

Technological University of the Philippines

May 21, 2025

Appendix E

Certificate of Similarity Index Using Turnitin

	TECHNOLOGICAL UNIVERSITY OF THE PHILIPPINES Ayala Blvd., Ermita, Manila, 1000, Philippines Tel No. +632-5301-3001 local 711	Fax No. +632-521-4063 Email: urds@tup.edu.ph	Website: www.tup.edu.ph	Index No.	REF-URD-INT-CSI
		Issue No.	01
		Revision No.	01
		Date	04132021
VRE-URD	CERTIFICATE OF SIMILARITY INDEX USING TURNITIN	Page	1 / 1
		QAC No.	CC-04132021

This is to certify that the manuscript entitled,

ADEPT AND YIELD OPTIMIZING SYSTEM: WEB-BASED-APP FOR APPLIANCE REPAIR SERVICES (AYOS)

authored by

RALF GABRIEL M. AYUBAN
RYAN M. DELA CRUZ
MICHAEL VINCENT G. MARTIN
MARCOS DARWIN P. TULALIAN

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Faculty Staff, URDS

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Transaction ID	COS-BSIS-2425246
Signature	

Appendix F

Certificate of Similarity Index Using Turnitin from URDS

8% Overall Similarity

The combined total of all matches, including overlapping sources, for each database.

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▸ Bibliography
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▸ Cited Text
▸ Small Matches (less than 8 words)

Match Groups

🔴 **136** Not Cited or Quoted 8%
Matches with neither in-text citation nor quotation marks

🟠 **0** Missing Quotations 0%
Matches that are still very similar to source material

🟡 **0** Missing Citation 0%
Matches that have quotation marks, but no in-text citation

⚫ **0** Cited and Quoted 0%
Matches with in-text citation present, but no quotation marks

Top Sources

5%   🌐 Internet sources

2%   📖 Publications

6%   👤 Submitted works (Student Papers)

Integrity Flags

0 Integrity Flags for Review

No suspicious text manipulations found.

Our system's algorithms look deeply at a document for any inconsistencies that would set it apart from a normal submission. If we notice something strange, we flag it for you to review.

A Flag is not necessarily an indicator of a problem. However, we'd recommend you focus your attention there for further review.

List of Appendices

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MICHAEL VINCENT G. MARTIN

CONTACT

📞 +09386954871

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📍 Paco Obando Bulacan

EDUCATION

SENIOR HIGH SCHOOL
        2018 - 2020
OUR LADY OF FATIMA UNIVERSITY (OLFU)

JUNIOR HIGH SCHOOL
        2014 - 2018
POLO NATIONAL HISH SCHOOL (PNHS)

COLLEGE
        2020 (PRESENT)
TECHNOLOGICAL UNIVERSITY OF THE PHILIPPINES (TUP)

SKILLS

PROGRAMMING

FAST LEARNER

FAST TYPING

PROFILE

BIRHTDAY: JUNE 8, 2003

AGE: 21

GENDER: MALE

ADDRESS: 1196 MAPAGKUMBABA ST. PACO OBANDO BULACAN

WORK EXPERIENCE

● 2023 - 2024

Working in the fast food industry offers invaluable experience that goes beyond preparing and serving food. It provides a dynamic environment where employees develop a wide range of skills that are transferable to other industries and roles. Here's a detailed explanation of how fast food experience can shape professional growth:

● 2019 - 2020

il've also been helping my uncle in his job and the task that i usually do is encoding. Work experience in encoding offers critical skills that contribute to accuracy, Organization, and efficiency in data management and processing. Here's a comprehensive explanation of how encoding experience translates into valuable professional capabilities.

INTERESTS

BASKETBALL

ONLINE GAMES

MUSIC

SOCIAL

INSTAGRAM: MVMRTNNN

FACEBOOK: MV MARTIN

RALF GABRIEL M. AYUBAN

MY CONTACT

Phone
+09777576417

Email
ralfgabrielayuban123@gmail.com

Address
422 Steve Street, Barangay Commonwealth, Quezon City

SKILLS

- Working Well Under Pressure
- Time Management
- Flexibility In All Types of Task
- Coding

Technical Skill

- Adobe Photoshop
- Adobe Animation
- Adobe Illustrator
- Figma
- C Programming
- Python
- HTML
- CSS
- Java

EDUCATION

Commonwealth Elementary School
2009 - April 2015

Commonwealth High School
Jun 2015 - April 2019

Our Lady of Fatima University (Quezon City)
2019 - 2021

Technological University of the Philippines - Manila
2019-Present

Achievement

- With honor in high school
- With honor in Senior high school

Dean Lister
- College 2nd year 1st Sem and 2nd sem
- College 3rd year 2nd sem

Interest

- Gaming
- Music
- Watching Movie

MARCOS DARWIN TULALIAN

STUDENT

CONTACT

📞 09513178437

✉ marcosdarwin.tulalian@tup.edu.ph

📍 Laguna

SKILLS

- Adobe Photoshop
- Willingness to learn
- Figma
- Python
- HTML
- CSS
- Java
- Coding
- Active listening
- Commitment to excellence
- Problem-solving

LANGUAGES

- English
- Filipino

PROFILE

I am a dedicated student who believes in continuous learning. I strive to improve myself each day, making sure to actively seek out opportunities to expand my knowledge and skills. In everything I do, I aim for excellence, putting in the effort and attention to detail required to achieve high-quality results. I take pride in maintaining organization and clarity in my work, ensuring that everything is neat and well-presented. My goal is to not only meet expectations but exceed them through commitment, consistency, and a focus on achieving the best possible outcomes.

EDUCATION

2021

SAN PEDRO RELOCATION CENTER
NATIONAL HIGH SCHOOL

- STEM

Present

TECHNOLOGICAL UNIVERSITY OF
THE PHILIPPINES

- Bachelor of Science in
  Information System

HOBBIES AND INTERESTS

- VIDEO GAMES
- FICTION BOOK
- MOVIES
- DRAMA SERIES
- SLEE[

Ryan Dela Cruz

WEB DEVELOPER

IS STUDENT

09911706297
ryagondev@gmail.com
767F Ma Susafe San Antonio
Valley 1, Parañaque City

linkedin.com/in/rynmdc

Summary

I have experience in developing web-based applications as a student, showcasing my skills in creating functional and user-friendly software solutions. Additionally, I have worked full-time as a customer representative, honing my communication, problem-solving, and time-management abilities in a fast-paced environment.

Work Experience

CUSTOMER SERVICE REPRESENTATIVE
Ibex Global Solutions Philippines
June 2022 - Present
- Managed customer service operations for two accounts, Walmart and Conifer Healthcare, ensuring timely and effective resolution of client inquiries and concerns.
- Demonstrated strong communication and multitasking skills by handling high-volume customer interactions across diverse platforms.
- Collaborated with team members to streamline processes, contributing to improved client satisfaction and operational efficiency.

TECHNICAL SUPPORT REPRESENTAIVE
VXI Global Solutions Philippines
January 2022 - May 2022
- Provided technical support and sales assistance for the DirecTV account, addressing customer inquiries and resolving technical issues efficiently.
- Achieved sales targets by recommending suitable products and services, showcasing strong product knowledge and persuasive communication skills.

GRAPHIC and VOICE OVER ARTIST
Freelance thru Fiver and Upwork
January 2018- December 2020
- Designed visually compelling graphics for various clients, delivering creative solutions tailored to meet specific project requirements.
- Provided professional voice-over services for diverse projects, demonstrating versatility and adherence to client specifications.

Educational History

BACHELOR OF SCIENCE IN INFORMATION SYSTEMS
TECHNOLOGICAL UNIVERSITY OF THE PHILIPPINES - MANILA
2021 - Present

HIGH SCHOOL
Paranaque National High School - SHS
2015 - 2021

Relevant Skills

- Proficiency in MERN stack development (MongoDB, Express.js, React, Node.js)
- Expertise in building dynamic and responsive web applications using React
- Familiarity with RESTful APIs and state management libraries (e.g., Redux, Context API)
- Creative problem-solving and attention to detail in web and graphic design
- Strong communication and collaboration skills for client and team interactions
- Effective time management and ability to meet deadlines in dynamic environments