



**WEB-BASED FINANCIAL AID SYSTEM FOR MUNICIPAL SOCIAL
WELFARE AND DEVELOPMENT OFFICE OF PILAR, BATAAN**

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ABSTRACT

Financial assistance programs offer families and individuals cash support to help them satisfy their basic requirements while promoting as much independence as possible. It is one of the programs or services offered by the Municipal Social Welfare and Development Office of Pilar, Bataan which is obliged to offer fundamental social welfare programs and services to its underprivileged population.

These people should be provided with an efficient way to apply for financial assistance programs. As some MSWD offices still use the traditional way, people may have difficulties in applying for financial assistance particularly the cost of travel when these people will come from distant places. MSWD offices should also be provided with a better way of gathering information and storing data.

Therefore, the researchers concluded that a web-based financial aid system will be helpful for these people. They can request financial assistance with the use of devices like smartphones or computers as long as they have the internet at home. MSWD offices will also benefit as the process of gathering information and storing data will be automated. An additional feature like generating statistical reports to determine the number of people who applied and if they are eligible.

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CHAPTER I

THE PROBLEM AND ITS BACKGROUND

This chapter offers broad descriptions of the topics the researcher will cover in this study. The backdrop of the investigation, the research topic, the purpose, the importance of the study, the scope and limitations of the study, and the definition of important terminology are just a few of the subheadings in the introduction.

Background of the Study

The Philippines is known for being one of the poorest countries in Southeast Asia. In the year 2022, inflation makes a huge impact on the economy of the country and it keeps rising as the day passes. The main cost of inflation is the loss of real income, which occurs when prices rise unevenly and cause some buying power of the customers to decline. For both those who receive and pay fixed interest rates, inflation might over time affect their ability to make purchases. Poor, disadvantaged individuals, families, and communities, are vulnerable to this problem and they are the reason why each community has to implement emergency or financial assistance to help fulfill their needs.

One of the known provinces in the Philippines is the province of Bataan. Central Luzon area contains the province of Bataan. It is recognized in history as the final American bastion in the Philippines when the Japanese attacked it during World War II. The peninsula is bounded by Manila Bay to the east and the West Philippine Sea (or the South China Sea) to the west. Governor General Pedro Manuel Arandia founded Bataan in 1754 from areas that had formerly belonged to Pampanga and the corregimiento of Mariveles, which at the time also included Maragondon in Cavite across the bay. Historical milestones occurred in the province in abundance. The Abucay Massacre was committed in 1647 in



one of the cities of the country by Dutch Naval Forces trying to conquer. As he began his invasion of Luzon in the late 1700s, the infamous Chinese private Limahong landed at Lusong Point on the western flanks. Bataan joined the other provinces of Luzon in the Philippine Revolution of 1896, which was an uprising against Spanish control. But it was not until the Second International War that Bataan rose to prominence and earned its place in world history. The desperate Filipino-American troops bravely held off the invading Japanese force's heavy artillery and aircraft fire until the "Fall of Bataan" on April 9, 1942.

One of the oldest towns in the province of Bataan is Pilar. Spaniards from the galleon arrived in a Balanga sitio and were welcomed by the locals. The town was given the name "Pilar" in homage to the statue of Our Lady of the Pilar. The capital city of the province, Balanga, is situated north of Pilar. One of the services offered by Pilar is the emergency assistance that is held by the Municipal Social Welfare and Development Office (MSWDO). MSWDO is the main welfare of the government organization in charge of enhancing the living conditions and quality of life of the poorest in the population segment through a variety of programs and services aimed at empowering them to achieve self-sufficiency and contribute to the development of the country.

The process for applying for their service can be done manually. Those who will apply must go to the main office to submit the required documents. Upon submission of the requirements, an MSWDO staff will assess their client/beneficiary. After the assessment, they will give their client a certification that will be submitted to the office of the mayor for approval. There is a rule for financial assistance. Once the client received assistance, they should not apply again within three (3) months unless they will apply for a different beneficiary/patient. MSWDO has nothing but a logbook where the client



information must be written. MSWDO staffs only rely on their memory and sometimes, a client passed the MSWDO assessment but not one office of the mayor because they do not have anything to check if their client received assistance at that time, and three (3) months have not passed.

Due to the above reasons, the researchers proposed a system named “Web-based Financial Aid System for Municipal Social Welfare and Development Office of Pilar, Bataan” which will provide the staff with a better way of processing the applications for financial assistance. It will also benefit those who will apply for financial assistance as the required documents will be displayed. The web application will also let them apply online. Once their applications were submitted, they will go to the MSWDO for assessment and all they have to do is to wait for the app via SMS.

Statement of the Problem

This research answered the following questions:

1. What are the technologies to develop a Web-based Financial Aid System for the Municipal Social Welfare and Development Office of Pilar, Bataan?
2. What features and functionalities will be provided by the Web-based Financial Aid System for Municipal Social Welfare and Development Office of Pilar, Bataan?
3. How will the system be evaluated in terms of the following areas?
 - a) Functional Stability
 - b) Performance Efficiency
 - c) Compatibility
 - d) Usability



- e) Reliability
- f) Security
- g) Maintainability
- h) Portability

Objectives of the Study

This research aims to develop a Financial Aid System which will provide an easier request for burial and medical financial assistance and process financial assistance applications including the approval, granting of financial assistance, and generating of financial reports.

Specifically, it aimed to:

1. Identify the technologies to develop a Web-based Financial Aid System for the Municipal Social Welfare and Development Office of Pilar, Bataan.
2. Identify the features and functionalities that will be provided by the Web-based Financial Aid System for Municipal Social Welfare and Development Office of Pilar, Bataan.
3. Evaluate the system functionality using ISO 25010 Standards.

Significance of the Study

The research is found useful among the following beneficiaries:

Administrator – the result of the study will help them guide their staff and monitor those who apply for their financial aid services.



Client/Beneficiary – they are the people who will greatly benefit from the study. The outcome of the study will provide an easier request for financial assistance and track them in real-time.

Pilar MSWDO – the outcome of the study will provide them with a more efficient way of processing applications. It will help them monitor the financial requests and help them save time and effort because tasks will be automated as possible.

Future Researchers - the concepts offered might be utilized as a starting point for future study or to verify the validity of previous related discoveries. The research will also act as a cross-reference for them, providing a background or overview of the web-based financial aid system for the Municipal Social Welfare and Development Office.

Scope and Delimitation

For the benefit of the Municipal Social Welfare and Development Office of Pilar, Bataan, the researchers established the parameter of the study that mainly focused on the design and develop a system that will implement and maintain the Web-based Financial Aid System for Municipal Social Welfare and Development Office.

Administrator:

1. Log in to the system
2. Manage accounts (staff and clients)
3. Print reports

Client/Beneficiary:

1. Log in to the system
2. Apply for financial assistance and ID
3. Track their financial applications



MSWDO:

1. Log in to the system
2. Manage records (approve and reject)
3. Print reports

Mayor:

1. Log in to the system
2. Grant application
3. Print reports



Definition of Terms

Application – a formal request to an authority for something.

Beneficiary - the individual or organization you have chosen legally to receive the advantages of your financial products.

Financial Aid System – it is a system that can be used by individuals to apply for financial assistance.

Financial Assistance – official help is given to a person or organization in the form of money.

Financial Report - enables finance teams to monitor and evaluate cash inflows and outflows to assist detect present and future cash flow issues.

Grant - a sum of money that the government has specifically provided to a person or organization for a particular purpose.

Municipal Social Welfare and Development Office (MSWDO) - according to the Local Government Code of 1991, the Office of Municipal Government on Social Welfare and Development is responsible for addressing issues associated with poverty and is dedicated to providing care, protection, and rehabilitation to individuals, families, organizations, and communities.

System - it is the modern electronic version of an old process or procedure.

Web-based Application – it is a computer program that will run in the format of a website.



CHAPTER II

REVIEW OF RELATED LITERATURE

Literature reviews are undertaken during the system development process to better understand the concepts, research, methodologies, and technology involved with the Web-based Financial Aid System for Municipal Social Welfare and Development Office of Pilar, Bataan. To understand the system requirements, in-depth research and comparison studies of current systems are also conducted. Secondary data was gathered from journals, publications, published theses and dissertations, and websites by the researchers.

The keywords related to the study include Automated SMS Alert System, Automated Email System, Appointment System, Record Management System, and Web Application.

Automated SMS Alert System

To begin with, Andrade-Chaico & Andrade-Arenas (2020), stated that every day, a Peruvian telecommunications business sends millions of SMS to market its services using SMS mobile advertising. Data collection, data preparation, and delivery are the steps in the workflow for delivering the SMS. Each process entails a series of dull and repetitive actions carried out by employees to send SMS on time and according to a planned timetable. When these duties are completed solely by hand, they have a detrimental influence on the performance of workers, cause time pressure, and create a bottleneck in operations that affect the SMS delivery timetable. To speed up the real operation, they used batch files and Python, a programming language with a large library that allowed us to connect to the Selenium automated testing suite. As a result, long-monotonous procedures were streamlined by simple scripts that required a worker to enter only a few inputs to complete

their duty. They cut the entire processing time in half with this automation, making the SMS distribution process simple and painless.

However, Khanim & Y.H. Ahmed (2018), argued that the prospect of using mobile technology in this study is investigated. In an academic library, technology can help improve services. For a university degree the research`s goals are as follows: (i) Take a look at the library notification service that is currently available in your area. (iii) Propose a platform that can enable the notification service; Enhance the University of Malaya`s library notification service; and (iv) Assess the new suggested library`s prototype system of alerts. Investigate the present library notification service for pupils. Sixty-one percent of respondents said they didn`t get notifications about overdue books or information about new book arrivals. The data also show that a majority of respondents (58 percent) believe that including the planned notification system will make it easier to alert students about overdue books, new book arrivals, and operating schedule changes. As the assessment of the prototype suggests, respondents were amenable to creating a supporting platform that may improve library notification service in the University of Malaya library via mobile technology by deploying an SMS-based notification system.

Moreover, Nanwin & Ofor (2018), pointed out that information and communication technology has made life easier for people by providing services that have improved their overall well-being. Users are not alerted when fresh mail is received in their mailboxes. They must inspect their mailbox content speculatively and regularly. The majority of the time, users neglect their mailboxes, resulting in a lack of awareness of crucial mail/letters. Individuals may now get information at their leisure thanks to the evolution of Short Message Services (SMS). The construction of an automated SMS alert mailing system to



notify mail receivers of mail put in their mailboxes is described in this paper. The employment of SMS technology as a solution to the problems caused by ignorance and neglect would enhance postal services. Exploring this technology in the postal service will make life easier for people and increase the value of mailing systems in society.

In addition, Agrawal, et al. (2017), believed that the mobile network communication system provides services that have simplified and improved the lives of everyone. With the development of short messaging services (SMS), information may now be sent to those who are far away from the sender. The deployment of an SMS-based system to identify malfunctioning blast furnace equipment based on set limitations is described in this study. If a piece of field equipment fails or exceeds the established limit, an SMS is sent to the end user, and the problem is escalated after a certain period.

On the other hand, Osman (2017), revealed that the inspiration for their study originates from the rising popularity of web-based systems and the necessity to investigate the Short Message Service (SMS) technology that libraries might utilize to improve their user services. Using SMS technology, their study proposes a notification-based content alert and web-based solution. It was created primarily to notify patrons about the renewal date and availability of reserved books. The major goal of implementing SMS-based content alerts in the library system is to save money and time for both the librarian and the users. As a result, the system was programmed to send customers an SMS text message alerting them to the due date for returning the book and the availability of the book they had booked. In addition, to improve library services, the web-based system with SMS notification was connected with the Online Public Access Catalog (OPAC) system. The waterfall paradigm was used to design this system, which followed the System



Development Life Cycle (SDLC). The efficacy of the system was determined by examining the questionnaires, which were classified into five categories. User acceptability testing was done with 21 librarians to determine the effectiveness of the system. The majority of participants were happy with all of the categories presented, according to the results of the system evaluation. As a result, the web-based and SMS-based notification systems of the library are the most convenient, cost-effective, and dependable means of notice.

Automated Email System

Karger, et al. (2019), stated that email handling necessitates a substantial amount of work on the part of both senders and recipients. It is possible that some of this labor can be automated. They conducted a mixed-methods need-finding research to learn: (i) what kind of automated email handling customers desire, and (ii) what kind of data and computation are required to support such automation. A design workshop to define categories of needs, a survey to further understand those categories, and a categorization of current email automation software to evaluate which needs have been satisfied were all part of our inquiry. Their findings point to the need for a more detailed data model for rules, additional ways to control attention, using internal and external email context, complicated processing like response aggregation, and sender affordances. They created a framework for creating short scripts over a mailbox of users to further analyze our results. Half of the automation discovered in their research is hard to implement in common email clients, prompting new design possibilities.

In addition, Abbas & Khan (2019), described that email is the most extensively utilized method of textual communication, particularly between teachers and students. The majority of normal email answers are repetitious in nature, yet they take up a significant



amount of academic time. Much of this time may be saved by using an automated email response system. The goals of this study are to identify and classify sentiment in student-teacher email discussions and to identify signs of politeness and impoliteness in emails. This will eventually assist in the generation of more human-like responses. They presented a way to discover these emotions via deep learning, based on the basic emotions of Ekman. By limiting their research to student-teacher discussions, they can identify the emotion and its intensity in a smaller area.

Appointment System

Pankaj, et al. (2022), mentioned that the Online Appointment application, a smart online application that offers security and allows physicians to register themselves and confirm patient appointments, is considered a case study to compare the effectiveness of the system with other doctor-patient appointment systems.

In addition, Akshay, et al. (2019), observed that within a certain geographic region, Bookazor is a web-based appointment booking and scheduling tool used for arranging appointments with offices of doctors, hospitals, and architects. This application has been optimized on an ionic foundation. It is a hybrid mobile application development SDK that is a free source. It makes use of CSS, HTML, and JavaScript technologies. When it comes to gathering information for appointment scheduling, Firebase plays a crucial part in efficient application development. It offers features that aid in user concentration, such as analytics, databases, messaging, and crash reporting. The system uses NodeJS to store the number of requests, each of which indicates the order in which a certain user should visit various locations. The NodeJS server is used to offer appointments at predetermined times, utilize the table to determine whether there are workers available in certain locations at



predetermined times, and put new tasks into the routes to reflect scheduled appointments. A scheduler prevents duplication by frequently updating the routes, such as through the use of a simulated annealing process.

Record Management System

Hasyiyana, et al. (2021), stated that with ever-changing technology at our disposal, they seek efficiency in all facets of our everyday lives in society today. The present manual technique of the City of Windhoek (CoW) is time-consuming and results in a large amount of paperwork. For data collection and analysis, a qualitative study design was used to reflect a smaller population of CoWs. The research looked into how the CoW promotes, processes, and distributes residential plots to its inhabitants to reduce inequity in plot distribution and speed up the overall application clearance process. Applicants can apply for residential plots online using this technique. When a person applies system determines how many residential plots/houses they possess. Applicants will be immediately placed on a waiting list or given priority depending on the threshold of CoW.

Furthermore, Hamza, et al. (2019), claimed that their research proposes a computerized record-keeping system for the estate and marketing managers of Tenancy Investment Company, who are in charge of keeping track of tenants in residences and stores. The suggested system facilitates data access, consumption, and security. That work also offers a complete system development technique that encompasses system analysis and system design, as well as an explanation of how to construct a system methodically. The information for the study was gathered through interviews and observations at a specific investment firm and its tenants. Visual Basic 6.0 was used to create the system interface, which is self-explanatory and includes save, modify, and add commands.



Additionally, Day, et al. (2018), discovered that one issue in the healthcare business of the Philippines is doctor maldistribution, which has a significant impact on access of the patient to adequate care. In 2015, unattended fatalities accounted for 59.2 percent of all deaths in the country. The usage of a telepresence system is a realistic alternative since doctors may continue to give healthcare services to their patients even if they are located far away. The lack of medical characteristics is one of the drawbacks of medical teleconsultation. The research created a telepresence system that comprises a robot with medical gadgets built in, such as an otoscope, stethoscope, and ultrasound probe. In addition, the research included a wireless data hub that houses the online application and EHR administration system. MySQL was used to design the database structure. The web application was created using HTML5 and Flask to allow users to create, store, and access user and patient information, control the robot remotely, allow two-way video telecommunication with minimal delay even at low internet speeds of as low as 400Kbps, and receive real-time feed from the medical devices integrated into the robot. The built application received the following usability metrics after being tested by invited medical professionals: 93.89 percent completion rate, 93.58 percent relative efficiency, highly happy users, and a high system usability score (SUS) of 82.5.

Aside from that, Zhu & Hou (2018), believed that medical records are documents that detail the onset, progression, examination, diagnosis, and treatment of an ailment of a patient. Medical records play a critical role in medical treatment, education, prevention, research, and development. They are the foundational support conditions for hospital administration. Keeping conventional paper medical records is tough. It is also tough to look for information on paper medical records. With the advancement of information



technology, medical record administration may now be accomplished via information systems. For the digital administration of medical records, the electronic medical record system is critical. It has made a significant difference in the management efficiency of the hospital. Medical big data analysis may be done with the data from electronic medical records.

Moreover, Azhagiri, et al. (2018), pointed out that the goal of the project, dubbed "Secured Electronic Health Information Management System," is to safeguard a database including the personal medical record of a patient. In the existing system used by health care professionals, there are several obstacles in maintaining patient records. They are usually maintained manually, and the majority of the patient database or history is not easily accessible to doctors, which has an impact on the quality of patient care, as well as repeated prescribing or tests, which has an impact on the quality of health care provided, as well as an increase in cost and treatment time. A person with criminal intent may easily hack into a system and gain access to all sensitive information, which they can then exploit for the outside world. Maintaining a well-protected database is crucial, especially when dealing with sensitive data. Patients may be cautious to divulge serious health issues for fear of endangering their privacy and confidentiality of medical records. The goal of this project is to handle the aforementioned problem more efficiently and cost-effectively, with the sole purpose of reducing the time and resources required for such tasks, allowing the resources to be better utilized. The goal of this project is to protect medical records against hackers, viruses, Trojan horses, and other dangerous software.

In addition, Lu & Feng (2018), argued that the Hadoop frame structure-based residential health record management system (hereafter referred to as the system) is



characterized by huge data storage, parallel interactive computation, and rapid implementation of big data applications. This article combines with present management state of the current residential health record management system and integrates it with certain existing accomplishments to examine the development trend of the residential health record management system. It also integrates big data techniques into the health record platform, generating new technological schemes and ideas to construct a home health record management system that is easy to search and administer for hospitals and health management departments. This paper examines the necessity of system development; system demands are examined from the perspectives of demand analysis and business analysis, among other things; the platform is subject to overall design; and lastly, record generation is subject to detailed design.

Web Application

Kubota, et al. (2020), concluded that one of the most important aspects of any web-based system is web application security. As the internet has grown in popularity, numerous websites have been subjected to a variety of assaults. As a result, they will need to come up with a safe foundation for online apps. As a result, they must present a web application framework that not only analyzes the source code written by web developers but also dynamically finds vulnerabilities in the code. Although several research papers have offered ways for detecting vulnerabilities in web application assaults, these methods are ineffective because they do not exploit the information provided by online applications. As a result, they present a new approach that examines the source code of a web application and, if necessary, adjusts it; also, their method has a vulnerability detection method that is difficult to discover by prior methods. According to our implementation and tests, it is



feasible to identify genuine assaults against authentication leaks and SQL injection attacks utilizing dynamic queries, which were previously thought to be impossible to detect.

On the other hand, Yadav, et al. (2018), pointed out that web apps are interactive websites that are made up of server-based programs that provide user interaction and a variety of additional features. Web server security is therefore a critical feature for every organization that has a web server connected to the internet, as well as ensuring clients utilizing their websites have a safe online experience. The need for web developers that can create user-friendly online platforms such as mobile applications and web applications has increased in this age of the digital revolution. The number of people using online web apps is also increasing. They have seen a lot of attention on producing visually appealing online apps, but with such a significant quantity of sensitive user data at stake, greater emphasis on web security should be placed on the applications built.

Moreover, Kaur & Sharma (2018), suggested that user interfaces would be designed to meet their needs because users play a significant part in the success of any online application or web-based interface. Users may find a variety of websites and other web-based apps to meet their various requirements, such as communication, entertainment, and shopping. However, these come with a slew of various forms of usability issues. It is the responsibility of developers or engineers to apply usability evaluation techniques and methodologies to enhance websites and online apps to satisfy users. Their research will attempt to identify problems that have been addressed by assessing several popular web apps using various parameters. The usual observational methods of usability assessment were applied for this goal. A few issues with the examined web interfaces were discovered after testing these programs.

Furthermore, Kwon, et al. (2018), theorized that it is critical to think about diverse web-browser environments while testing client-side web apps. Distinct aspects of these settings, such as web browser types and underlying platforms, might create different sorts of errors in a web application. Web applications must be regression tested across these many contexts as they change. This procedure can be costly, resulting in delayed feedback on application failures because there are so many different contexts to consider. They suggest six strategies in this paper for giving a developer faster feedback on failures while regression testing web applications across many web browser settings. Their approaches are based on test case prioritizing methods; however, in this case, they prioritize web-browser settings based on data about recent and frequent failures. Four non-trivial and widely used open-source web apps were used to test our technique. Their findings reveal that our methodologies beat two baseline methods in terms of cost-effectiveness: no ordering and random ordering. The improvement rates for no ordering varied from -12.24 percent to 39.05 percent, while for random ordering, they ranged from -0.04 percent to 45.85 percent.

Last but not the least, Nirmal, et al. (2018), assured that a web application is an essential component of every organization in the internet world today. A web application can be a simple HTML website or a huge online gateway with several services available through a web browser. To create a web application, numerous technologies, and approaches are used. The development approaches include specific frameworks and libraries to standardize the application and create it quickly enough to fulfill market expectations. Web applications (web apps) are hardened to protect against security flaws known as web application vulnerabilities. A web application security vulnerability is any



flaw that allows an attacker to gain access to the web application and do unwanted operations on the target website. This might be anything from cross-site scripting (XSS) to server-side request forger (SSRF) and its ramifications, such as XML External Entity (XXE). Even though online applications are hardened to reduce vulnerabilities, large-scale web applications are still susceptible in the majority of situations after release. Critical vulnerabilities in large-scale online applications were discovered during security research and reported to the appropriate security research team. Through proper channels, the reporting was recognized and minimized. On Microsoft and Cisco products, Common Vulnerabilities and Exposures (CVEs) were reported and registered in the National Vulnerability Database (NVD). This book highlights insights and ideas about web applications and their vulnerabilities.



CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

This chapter outlines the strategies that were used in this study to complete the development of a Web-based Financial Aid System for the Municipal Social Welfare and Development Office of Pilar, Bataan.

Research Method Used

A descriptive research design was used because of the nature of the investigation. This approach provides for quantitative and qualitative descriptions of the state and attributes of the current situation. The researchers conducted interviews with the project participant to get the information needed to solve the challenges that the system will address.

Research Locale

The study was conducted at Pilar Municipal Hall which is located in the Province of Bataan. The place was chosen because they provide financial assistance to people who are faced with unexpected expenses which will benefit the study.

Respondents of the Study

The respondents of the study are the users are the target users, the MSWDO LGUs, and the residents of Pilar. These are the individuals who will largely benefit from this research. It has a population of 46,239 people, according to the latest census. Using the formula of Slovin ($n = N / 1 + Ne^2$) whereas: n = no of samples, N = Total population, and e = margin of error $46,23 / (1 + 46,239 (0.09^2))$ the researchers came up with 123 respondents including 3 IT experts for a total of 126 respondents to consider confidence

levels and margin of errors who tested the functionality of the system based on ISO/IEC 25010 standard.

$$n = N / 1 + Ne^2$$

$$n = 46,239 / (1 + 46,239 (0.09^2))$$

$$n = 123 \text{ residents} + 3 \text{ IT experts}$$

Software Development Methodology

Agile Development is a method of software development that allows researchers to manage a project by breaking it down into segments. Instead of providing everything at once after the project, it is a step-by-step approach for reviewing the system and document.

Plan, Design, Develop, Test, Release, and Feedback are the six phases of Agile Development, as represented in Figure 1.

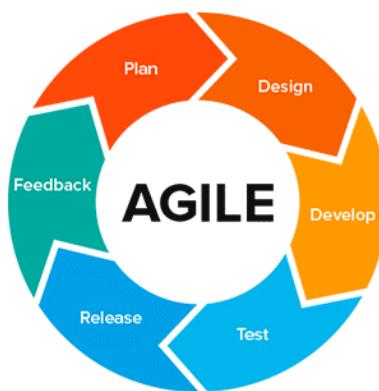


Figure 1 Graphical Model of Agile Methodology



Development Process for an Agile Project

Planning Phase

The designers, developers, and users will brainstorm in this phase to come up with a skeleton project conclusion. An Agile project, like any other, begins with defining and outlining the requirements of the client by developing a minimal feature list. Consumer input and the evolving customer wants should be accommodated in the planning.

Designing Phase

The designers will do their tasks in this phase. It consists of an initial model and prototypes. The program owner meets with the software development team and walks them through the requirements of the first step.

Developing Phase

Developers will be in charge of this phase. This is where all of the coding and testing happens. The team builds the product after reaching an agreement with the client on the plan. The product is provided in phases, with each sprint aimed at improving the current version of the product. Many adjustments are expected to be made to the initial release to enhance functionality and add new features.

Testing Phase

Unlike previous SDLCs, Agile features a testing phase in which the project is tested repeatedly after development until the developer and the user are satisfied with the output of the project. Because the product is now open, the team must run several tests to confirm that it is completely working. If any possible faults or weaknesses are discovered, the developers will address them right away. They also gathered user input at this point.



Releasing Phase

This is the point at which the hand over control to the user of the creator. Following a successful testing process, the next step will be to release the product. Customers may now access the software because it has been fully delivered. This action places him in the upkeep phase. During this phase, the software development team offers continuing support to ensure that the system continues to work properly and that any new defects are addressed. Further iterations to upgrade an existing product or add new capabilities are feasible over time.

Feedback

The developers need feedback to know how the output of the project affects the users. The Agile development cycle comes to a close at this point. The development team delivers to the owner the outcome attained in satisfying the criteria after finishing all previous stages of development. The Agile software development phases then restart — either with a fresh iteration or by progressing to the next step and growing Agile.

Research Instrument

Interview – an interview is a one-on-one conversation that is generally conducted to obtain information. It is also widely acknowledged as one of the most successful research tools. It is a discussion between two persons across a medium in which the interviewer asks questions to elicit information from the interviewee. The goal of conducting an interview is to collect data that will aid in the advancement and growth of the study.

Online Research – the digital tools and procedures utilized in online research techniques are used to compile information on a subject from an internet search. Both factual data and expert views may be included in the information acquired.



Survey Form - a survey is a questionnaire comprising questions aimed to collect data about the experiences of people, preferences, wants, and needs.

System Development Tools

The system development tools are the various tools, procedures, and strategies that researchers employed in constructing the system. These were used to better and enhance the needs of the system.

Use Case Diagram

A use case is a methodology used by the advocate to draw down the system flow and requirements. Utilize case charts are utilized in UML (Unified Modelling Language), a consistent representation for the displaying of genuine articles and systems.

Data Flow Diagram (DFD)

The DFD was utilized to portray the change of contributions to yields. This is utilized to graphically describe the stream of information and rationale inside the system.

Entity-Relationship Diagram (ERD)

Is a data modeling approach that visually depicts the entities and relationships between those elements in an information system. The entity framework infrastructure is represented by an ERD, which is a conceptual and representational model of data.

Mockups

It concentrates on the content of the project, which does not include any style. It is used to set out the content and capabilities of a project.



Technologies to be Used

To create the system, the researchers employed the following technologies:

1. **HTML** - a standardized system for tagging text files to achieve font, color, graphic, and hyperlink effects on World Wide Web pages.
2. **CSS** - describes how HTML elements are to be displayed on screen, paper, or in other media.
3. **PHP** - is a widely-used open source general-purpose scripting language that is especially suited for web development and can be embedded into HTML.
4. **MySQL** - a relational database management system available for free is called MySQL. MySQL stores data in tables made up of rows and columns, just like other relational databases. Structured Query Language, or SQL as it is more frequently known, allows users to define, modify, control, and query data.
5. **JavaScript** - it is a dynamic programming language that may be used for web development, web applications, game creation, and a variety of other things.
6. **Bootstrap** - a framework for front-end programming that can be used to create both websites and mobile apps. The HTML, CSS, and JavaScript (JS) foundation for bootstrap is intended to make it easier to create delicate mobile-first applications and pages.
7. **Semaphore** - enables you to send an SMS blast with just one line of code. Not having to bother with complicated setups or telecom protocols.



8. Web Host - it is an organization that leases or sells memory space on its servers. Web hosting is usually done at a data center, which offers clients services that allow them to publish websites on the internet.

Software Evaluation

The system was based on and evaluated using the ISO 25010 software quality standards. The functionality of a system was characterized based on criteria such as Functional Suitability, Performance Efficiency, Usability, Compatibility, Reliability, Maintenance, Security, and Portability.



CHAPTER IV

PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

This chapter presents the methods of the researchers for acquiring information regarding how the system responded to the stated difficulties. It covers the development of the system and the experiences of the beneficiaries with it. Also highlighted are the findings of the assessments made in response to the survey. Based on the product quality model described in ISO/IEC 25010, it assesses the Functional Suitability, Performance Efficiency, Compatibility, Usability, Reliability, Security, Maintainability, and Portability of the produced Web-based Financial Aid System for Municipal Social Welfare and Development Office of Pilar, Bataan.

The Traditional Way of Applying for Financial Assistance

The traditional way of applying for financial assistance is covered in this section. The traditional process of how the clients/beneficiaries submit an application for financial assistance and how the MSWDO staffs process them. Those who will apply for financial assistance must go to the MSWD office as shown in Figure 2.



Figure 2 Clients/Beneficiaries waiting inside MSWD Office

Then, the client must present all the required documents and the staff will verify them and they will conduct an assessment of their client as shown in Figure 3. The client will be given a certification from MSWDO and it will be forwarded to the office of the mayor together with all the required documents and wait for approval. MSWDO staffs also use log books to record their client information.



Figure 3 MSWDO Staff Conducting an Assessment of the Client

Development of the System

The system was created by the researchers using Agile Development. The team employs the iterative Agile Development process for software development. Cross-functional, self-organized teams routinely adjust projects by analyzing the environment and user requirements.

Planning Phase

The produced system of the study was remarked upon by the researchers in several areas. In terms of the functions that the system would support, this study gave a comprehensive specification of the system requirements. In September 2022, the researchers visited the beneficiaries to deliver the proposal letter outlining the features and functions of the suggested project as seen in Figure 4, Figure 5, and Figure 6.



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Ibayo, City of Balanga, Bataan
(047)-237 4334 | (047)-791 2791

September 20, 2022

Hon. Charlie Pizarro
Mayor
Pilar, Bataan

Ms. Jenny Lee Casin
Head
Municipal Social Welfare and Development
Pilar, Bataan

Subject: Web-based Financial Aid System for Municipal Social Welfare and Development Office

Dear Ma'am:

Greetings and good day!

Our team would like to propose a web based online system that will help for the processing of the application for the financial assistance. The following are the proposed features and functionalities of the system and the cost that will be incurred by your Company. Additional features requested by the beneficiary will be accommodated by the developers.

Features and functionalities of the System:

a. Client/Beneficiary

- Input of Data
- See the list of Requirements
- Tracking of their Assistance
- See their last application
- See available dates (Appointment)

b. MSWDO Pilar

- Check if the User is Qualified / Eligible
- Set an Appointment
- Reviewing of the Application
- See clients/beneficiaries last application

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Figure 4 Copy of Proposal Letter Page 1





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c. Admin

- Add Staff Accounts
- Manage Staff Accounts (Update and Delete)

The estimated cost of the system development:

Fees and	
➤ One (1) Computer Server	25,000.00
➤ Printer with bond paper	15,000.00
➤ Hosting and Domain	5,000.00
TOTAL COST OF THE PROJECT	45,000.00

Below are the details (Gant Chart) of the design, development, and implementation plan:

	June 3rd – 4th Week 2022	September 1st- 2nd week 2022	September 3rd – November 4th week 2022	December 2022
Purchase of necessary Equipments				
Planning and Design				
Development and Testing				
Implementation and Revision				
Formal Turn- over of the System				

The following will be working on this project:

- a. Marlou Nava (Researcher)
- b. Jonalyn Salas (Researcher)
- c. Jemmel Pizarro (Researcher)
- d. Danica Pepito (Researcher)

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Figure 5 Copy of Proposal Letter Page 2



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This study aims to help the people of Municipality of Pilar, Bataan by providing a system that will make request for financial assistance easier and more efficient processing of their applications.

We hope that this project will merit your positive response and approval.
Thank you very much.

Very truly yours,

M. Nava
Marlou Nava
System Developer

J. Salas
Jorelyn Salas
System Developer

J. Pizarro
Jemuel Pizarro
System Developer

D. Pepito
Danica Pepito
System Developer

Conforme:

C.L.P.
Hon. Charlie Pizarro
Mayor
Pilar, Bataan

J. Casin
Ms. Jenny Lee Casin
Head
Municipal Social Welfare and Development Office

P. Borja
Percian Joseph C. Borja
Capstone Adviser

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Figure 6 Copy of Proposal Letter Page 3

Ms. Jenny Lee Casin, the head of MSWDO Pilar agreed and helps us get the approval of Hon. Charlie Pizarro, the mayor of Pilar, Bataan, and I signed the proposal letter to work together on the project. The researchers revisited the office of MSWDO in the same month to obtain the signed proposal letter as shown in Figure 7.



Figure 7 Proposal Letter Signed

The researchers started investigating and getting acquainted with the web application and technologies they would be using. They have the determination to find the best technology, especially that can be used for SMS features that will be implemented in the web application. The researchers found out that Semaphores might be the best option for automated SMS features. Bootstrap data tables are also good to populate records into a table. The research was conducted online as shown in Figure 8.

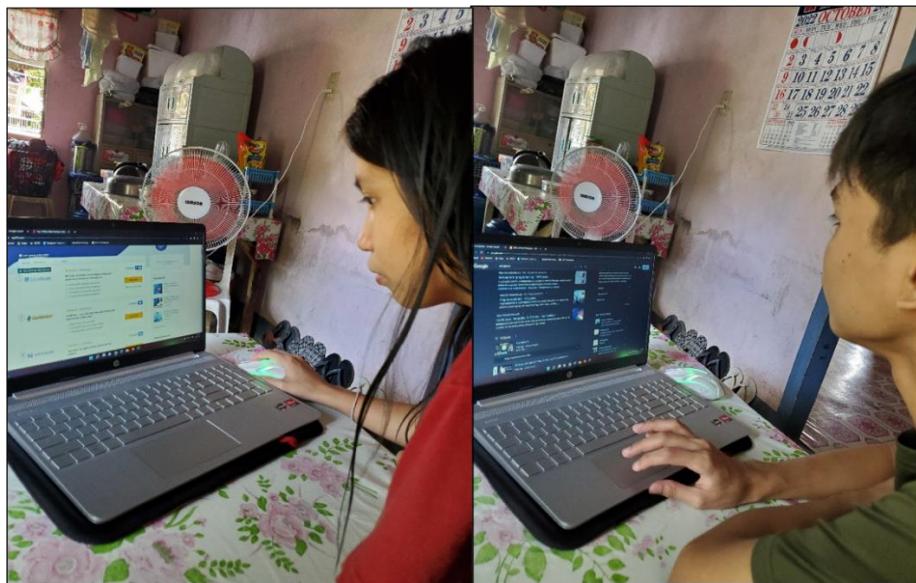


Figure 8 Online Research

The researchers conducted an interview with Ms. Jenny Lee Casin about the basic information about how clients apply for financial assistance and how they process them as shown in Figure 9. They found out that most of the processes can be only done manually. According to Ms. Jenny Lee Casin, they only use log books to store the data of their client and they count those data manually to make reports.



Figure 9 Conducting an Interview

Designing Phase

The production, usability, functionality, and services of the present system were all assessed by the researchers. To illustrate how the entities of the system interact with its operations, the researchers created the Use Case Diagram, Data Flow Diagrams (DFD), Entity Relationship Diagram (ERD), and Mockups in this section.

Use Case Diagram

The researchers conducted a thorough examination of the system-related transaction. It demonstrates the roles played by the four (4) entities—the administrator, client/beneficiary, the MSWDO staff, and Mayor—who have access to the established system seen in Figure 10.



Figure 10 Use Case Diagram

Context Level Diagram Level 0

Context Level Data Flow Diagrams display how a system interacts with other actors (external factors) that it is intended to communicate with. Diagrams showing the system context might be useful in understanding the setting in which the system will operate.

Four (4) entities that are engaged in the process of the system are illustrated in the context-level diagram, along with the various data flows indicated in Figure 11.

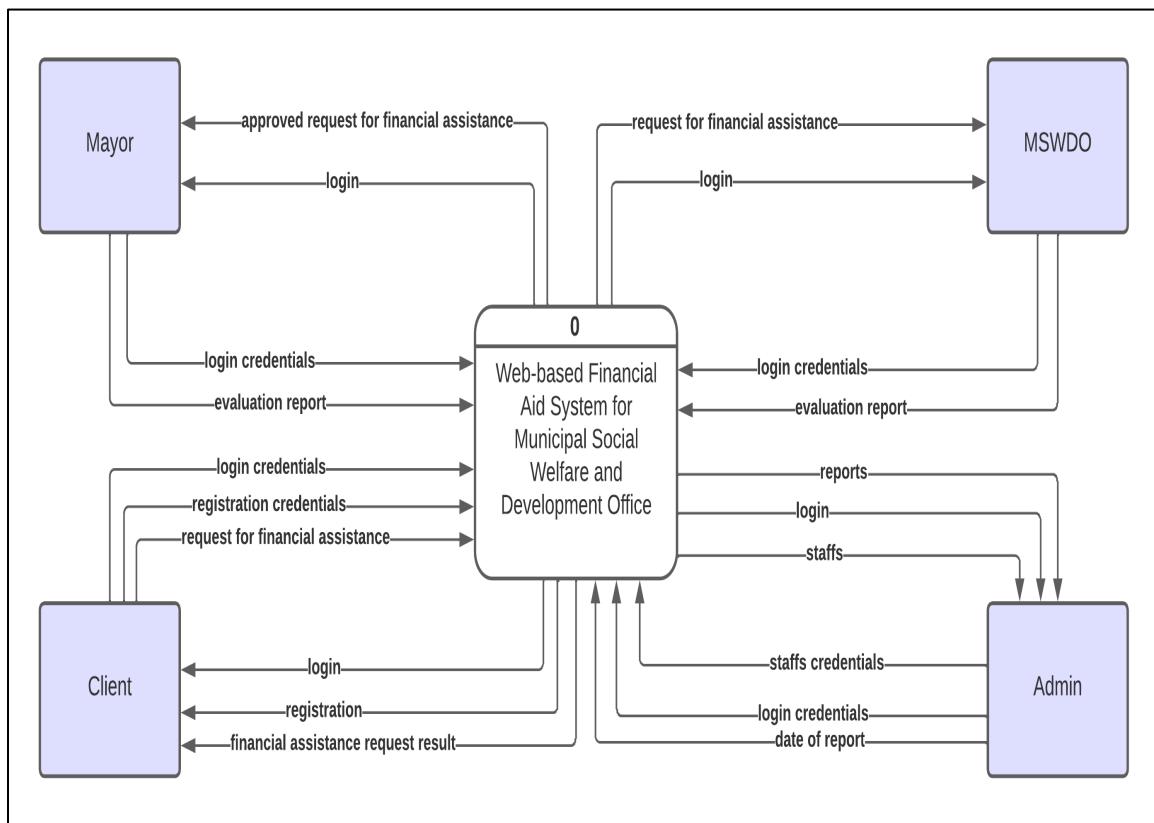


Figure 11 Context Level Diagram Level 0

Data Flow Diagram Level 1

Data Flow Diagram Level 1 not only offers a complete explanation of the operation of the system, but it also shows how the system is used by the four (4) entities that have access to it: the administrator, the clients/beneficiaries, the MSWDO Staffs, and Mayor. It divides the main process into smaller ones. Data Flow Diagram Level 1 also includes the data storage utilized by the primary process as seen in Figure 12.

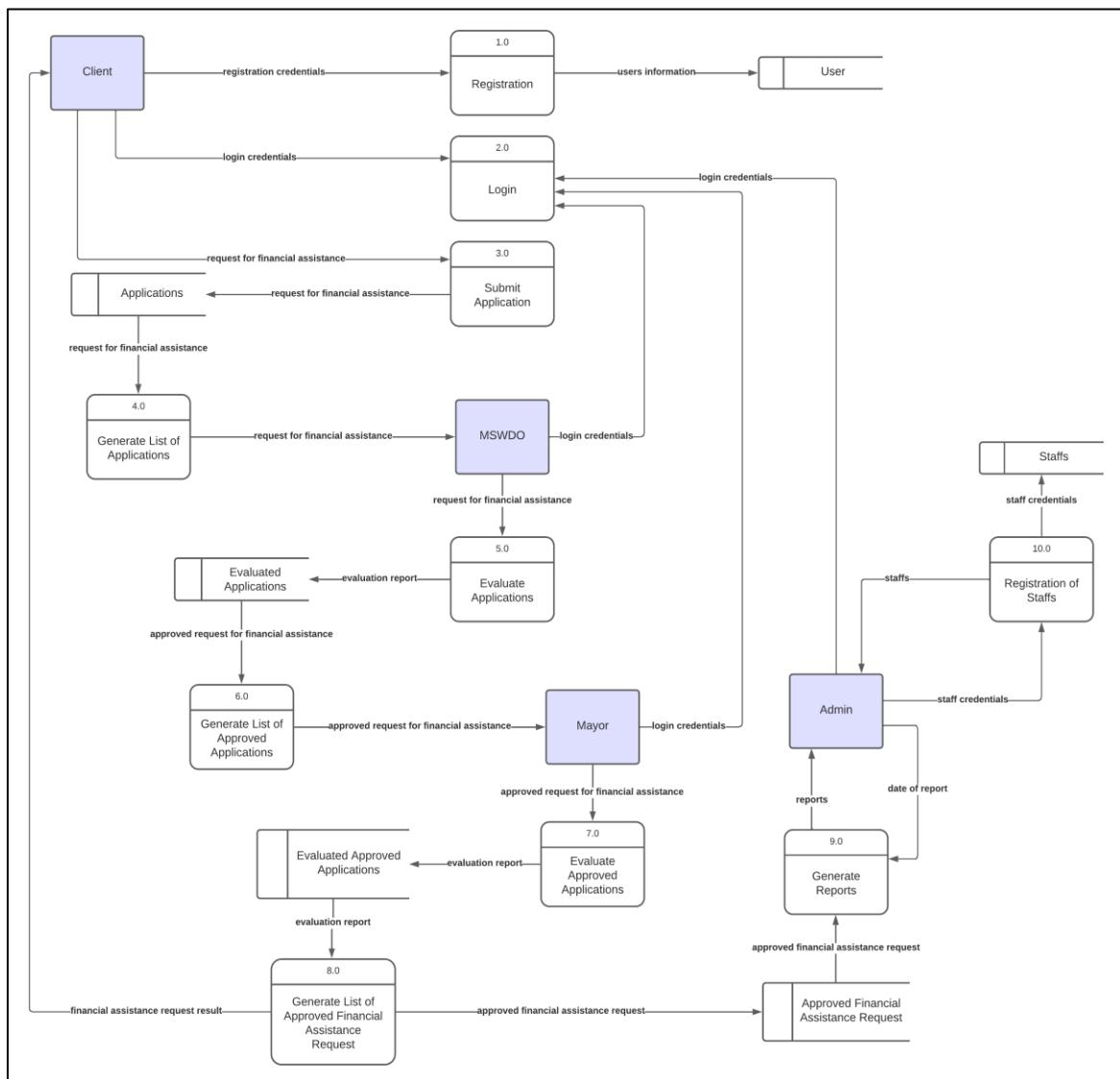


Figure 12 Data Flow Diagram Level 1

Entity-Relationship Diagram (ERD)

The Entity-Relationship Diagram (ERD) shown in Figure 13 was employed by the researchers to illustrate the contents of the data store. When building a relational database, it is quite important to be able to understand how data is connected broadly.

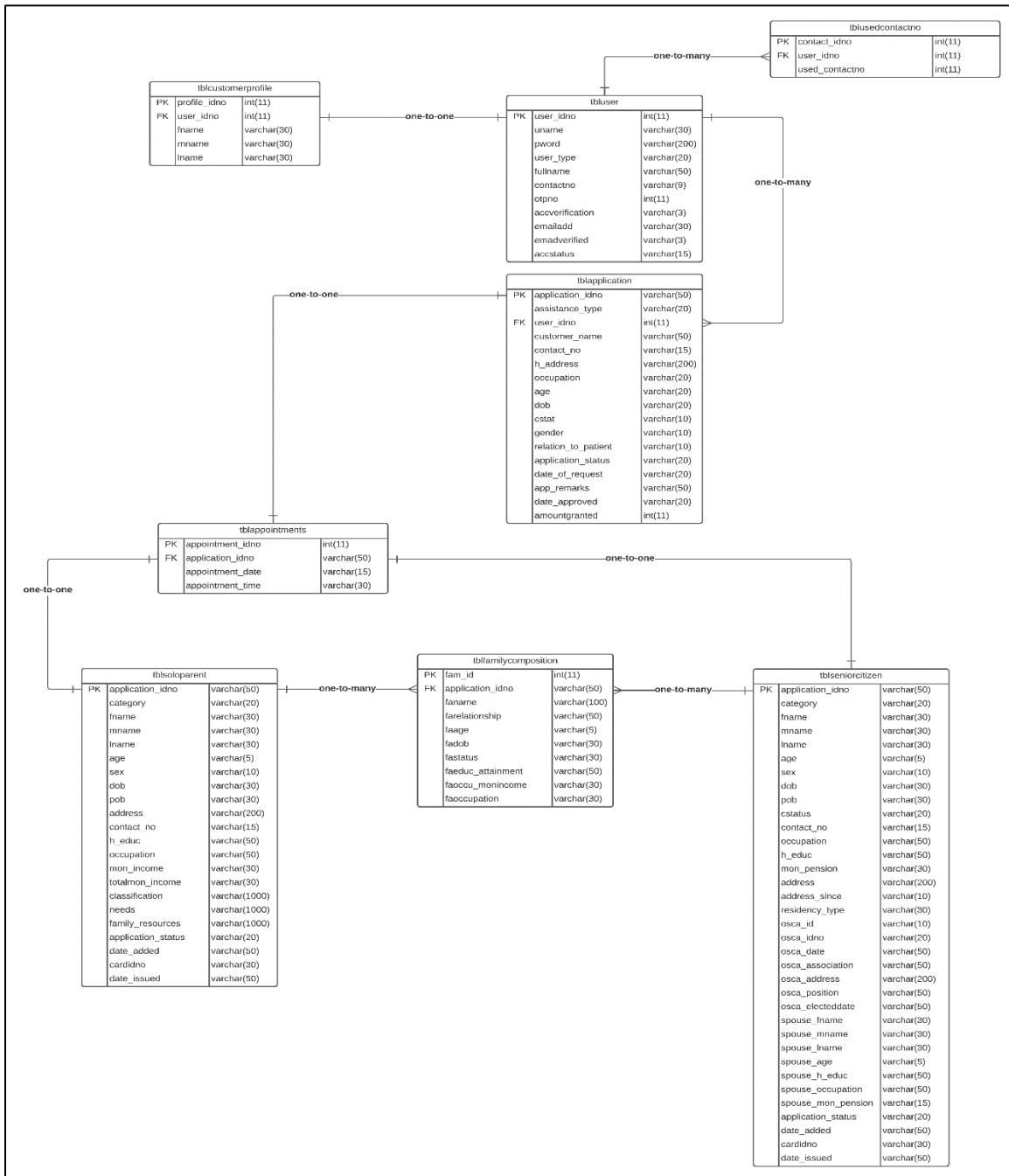


Figure 13 Entity-Relationship Diagram (ERD)

Mockup Design for Web-based Financial Aid System for Municipal Social Welfare and Development Office of Pilar, Bataan

In this section of the study, the researchers decided to create mockups, which are seen in Figures 14 to 18.

Once the users access the system, they will be redirected to the homepage where the users can log into the system as shown in Figure 14.

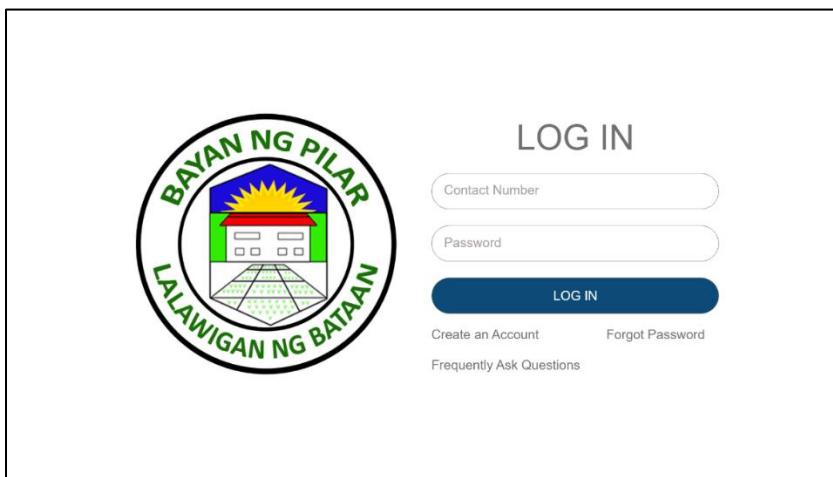


Figure 14 Login Page

The customer page where the client/customer can apply for financial aid is shown in Figure 15.

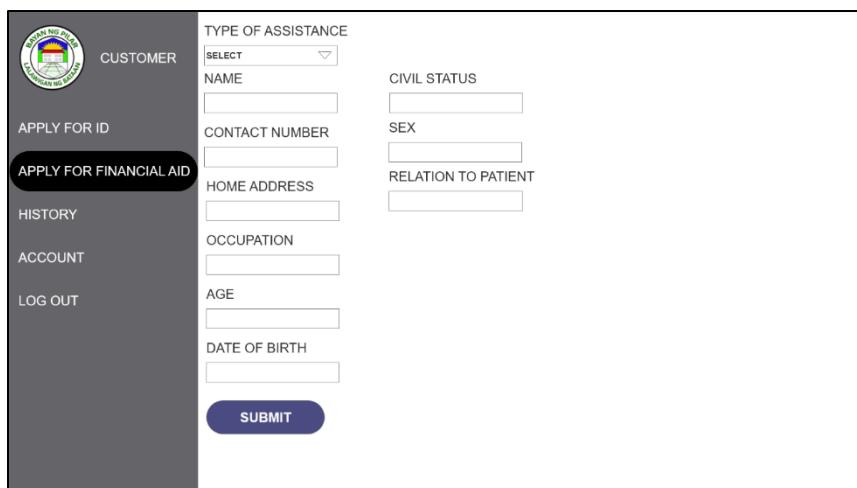
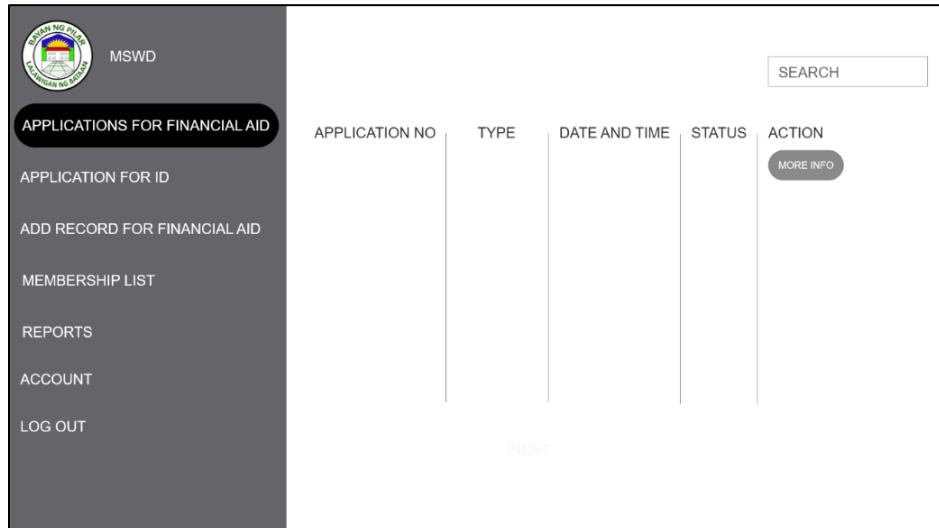


Figure 15 Customer Page



Figure 16 shows the MSWD Account Page where the staff can process the applications through the system.



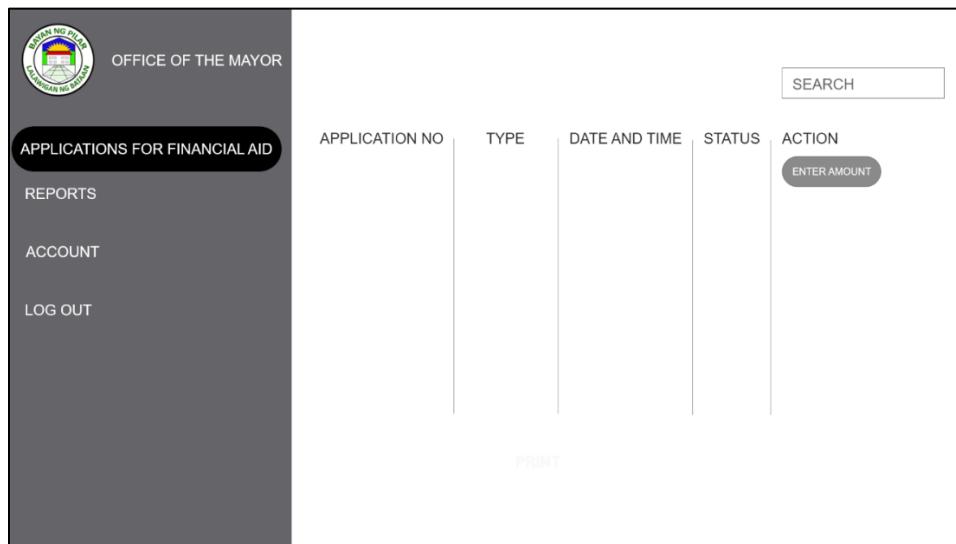
The screenshot shows a web-based application interface for the Municipal Social Welfare and Development (MSWD) account. On the left, there is a sidebar with the following menu items:

- APPLICATION FOR FINANCIAL AID (highlighted in a black box)
- APPLICATION FOR ID
- ADD RECORD FOR FINANCIAL AID
- MEMBERSHIP LIST
- REPORTS
- ACCOUNT
- LOG OUT

The main content area has a header with the text "MSWD". Below the header is a search bar labeled "SEARCH". To the right of the search bar is a table with columns: APPLICATION NO, TYPE, DATE AND TIME, STATUS, and ACTION. The ACTION column contains a button labeled "MORE INFO". At the bottom of the main content area are two buttons: "PRINT" and "ENTER AMOUNT".

Figure 16 MSWD Page

Figure 17 shows the office of the mayor user interface where the applications will be approved or rejected.



The screenshot shows a web-based application interface for the Office of the Mayor. On the left, there is a sidebar with the following menu items:

- APPLICATION FOR FINANCIAL AID (highlighted in a black box)
- REPORTS
- ACCOUNT
- LOG OUT

The main content area has a header with the text "OFFICE OF THE MAYOR". Below the header is a search bar labeled "SEARCH". To the right of the search bar is a table with columns: APPLICATION NO, TYPE, DATE AND TIME, STATUS, and ACTION. The ACTION column contains a button labeled "ENTER AMOUNT". At the bottom of the main content area are two buttons: "PRINT" and "ENTER AMOUNT".

Figure 17 Office of the Mayor Page



In Figure 18, the Administrator can manage their staff accounts and add and the setting of the role will be based on their tasks.

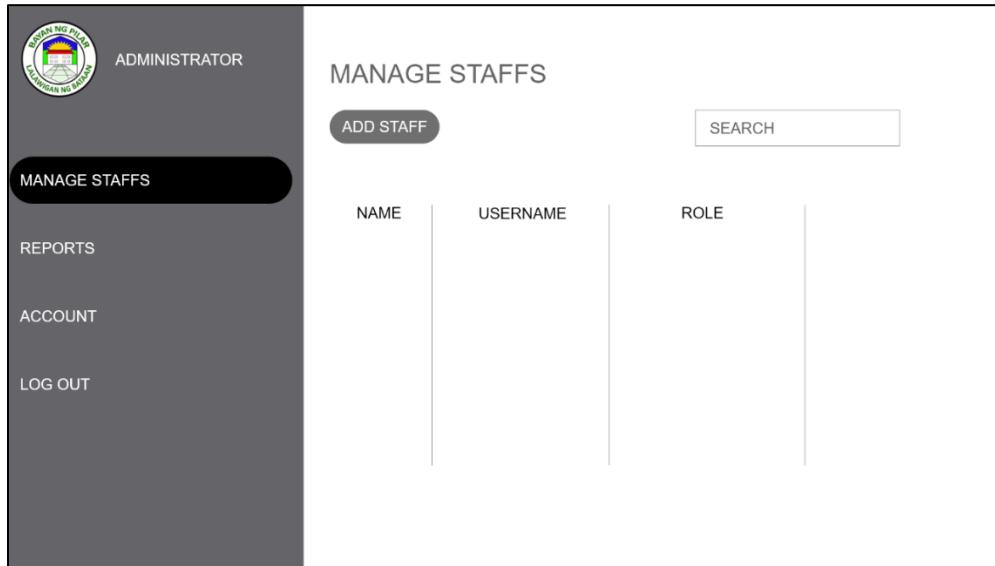


Figure 18 Administrator Page

Developing Phase

The system was put into development after the designing stage. They complete the required design of the system as well as the features, functions, and flow.

The researchers began constructing the design based on the scope of the system. The Web-based Financial Aid System for Municipal Social Welfare and Development Office of Pilar, Bataan was created to build a solution to the following problems.

1. What are the technologies to develop a Web-based Financial Aid System for the Municipal Social Welfare and Development Office of Pilar, Bataan?

The following technologies have been used and applied to help the developer construct the system listed below:

- 1. HTML** - a standardized system for tagging text files to achieve font, color, graphic, and hyperlink effects on World Wide Web pages.



2. **CSS** - describes how HTML elements are to be displayed on screen, paper, or in other media.
3. **PHP** - is a widely-used open source general-purpose scripting language that is especially suited for web development and can be embedded into HTML.
4. **MySQL** - a relational database management system available for free is called MySQL. MySQL stores data in tables made up of rows and columns, just like other relational databases. Structured Query Language, or SQL as it is more frequently known, allows users to define, modify, control, and query data.
5. **JavaScript** - it is a dynamic programming language that may be used for web development, web applications, game creation, and a variety of other things.
6. **Bootstrap** - a framework for front-end programming that can be used to create both websites and mobile apps. The HTML, CSS, and JavaScript (JS) foundation for bootstrap is intended to make it easier to create delicate mobile-first applications and pages.
7. **Semaphore** - enables you to send an SMS blast with just one line of code. Not having to bother with telecom protocols.
8. **Web Host** - it is an organization that leases or sells memory space on its servers. Web hosting is usually done at a data center, which offers clients services that allow them to publish websites on the internet.



2. What features and functionalities to be provided by the Web-based Financial Aid System for Municipal Social Welfare and Development Office of Pilar, Bataan is useful for the system user?

In Figure 19, once the client successfully logged in to the system, they will be redirected to the submission page where they can submit their information and request financial assistance.

Figure 19 Submit Application

In Figure 20, their pending and past submissions will be stored in the system so that they can also see the status of their applications.

Application Number	Type of Financial Assistance	Date & Time	Status
MSWD63B4EDFFE9FF6	Medical	Jan 04, 2023 11:09:51 am	Approved by Mayor More Info

Figure 20 Application History



In Figure 21, the MSWDO staff can see all the applications submitted by users and by walk-in clients. They can search for a record and trace whether the client received assistance or not.

Financial Assistance Applications								
Show 10 entries Search: Show All								
Application No.	Customer Name	Assistance Type	Home Address	Occupation	Relation to Patient	Application Status	Action	
MSWD63B4EDFFE9FFB	Mariou Palibe Nova	Medical	29 Santa Rosa Pilar Bataan	Student	Wife	Approved by Mayor	<button>View Application</button>	

Figure 21 List of Applications

In Figure 22, the system provides a logbook or list of members or issued IDs. Processed ID applications will be automatically logged here.

List of Members									
Show 10 entries Search: Previous Next									
Membership Type	Card ID No.	First Name	Middle Name	Last Name	Sex	Contact No.	Home Address	Date of Birth	Membership Date of Issuance

Figure 22 List of Members



In Figure 23, the system is also capable of disabling dates to prevent clients from setting an appointment on holidays or no office days.

The screenshot shows a web-based application interface. On the left, there's a vertical sidebar with a logo at the top and a list of administrative functions: Applications (Financial Assistance, Solo Parent ID, Senior Citizen ID), Add Membership, Membership List, Staff, Clients, Calendar, and Reports. The main content area is titled 'List of Staffs' and contains a button labeled 'Disable Date for Appointment'. Below this is a table with columns 'Date' and 'Action'. A message at the bottom states 'Showing 0 to 0 of 0 entries'.

Figure 23 Disable Dates

In Figure 24, the system can generate financial reports based on the count of membership in each category and gender. The system is also capable of printing them.

The screenshot shows a 'Monthly Report' page. The left sidebar includes the same administrative functions as Figure 23. The main area has a 'Monthly Report' title with two dropdown menus and a 'Submit' button. Below is a 'Financial Assistance Report' section with a 'Print' button. A table lists financial assistance details: Application ID, Fullname, Assistance Type, Relation, Amount Granted, and Date. Two entries are shown: one for 'MSWD63B4EDFF9FF6' and another for 'Marlou Palibe Nava'.

Figure 24 Reports



In Figure 25, the applications will be escalated to the office of the mayor once approved by MSWDO staff. Here, the office of the mayor will decide the amount that will be given to the client or reject it.

Application No.	Customer Name	Assistance Type	Home Address	Occupation	Relation to Patient	Application Status	Action
MSWD63B4EDFEE9FF6	Marlou Palibe Nava	Medical	29 Santa Rosa Pilar Bataan	Student	Wife	Approved by Mayor	<button>View Application</button>
Application No.	Customer Name	Assistance Type	Home Address	Occupation	Relation to Patient	Application Status	Action

Figure 25 Grant Application

In Figure 26, the admin can add staffs and set what role depending on their tasks.

Fullname	Username	Role	Status	Action
Charlie Pizarro	mayor	mayors office	active	<button>Mark as Inactive</button>
Jemmel Pizarro	jommel	staff	active	<button>Mark as Inactive</button>
Fullname	Username	Role	Status	Action

Figure 26 Add Staff

Testing Phase

During this phase, the researchers ask for the help of IT professionals to test and evaluate the system. The IT professionals, Ms. Kristine Gaan, Mr. John Carlo Asilo and Ms. Daisy Villanueva, all work from the “The Bunker” building located in the city of

Balanga, Bataan, tested and evaluated the system. According to them, the system functions very well. However, a few bugs and glitches that need to be fixed were found during the testing and to make it more user-friendly, they added that it needs more changes—particularly in terms of design—as well as little tweaks and enhancements in terms of system operation. As shown in Figure 27.

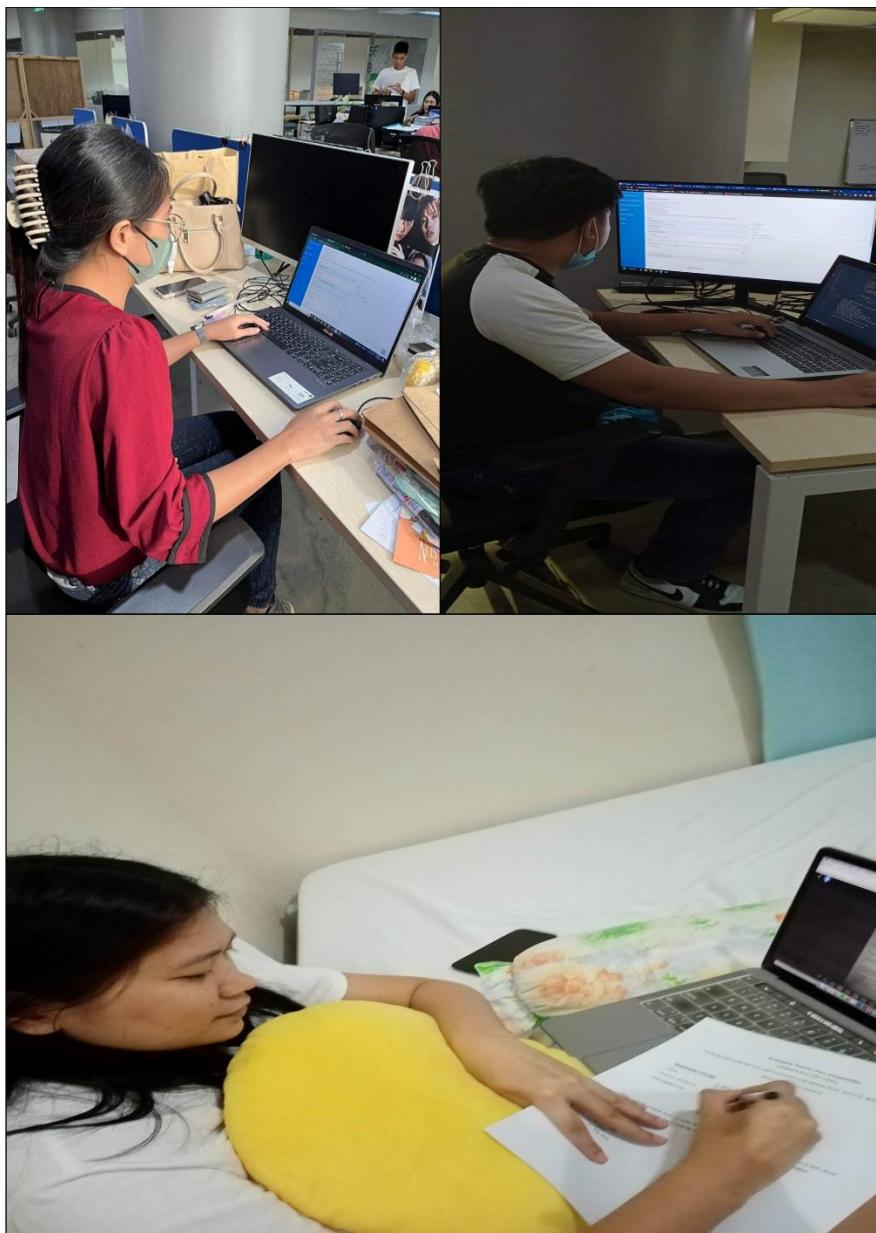


Figure 27 IT Professionals Testing and Evaluating the System

Releasing Phase

During this phase, the head of MSWDO, Ms. Jenny Lee Casin from Pilar, Bataan tested the newly built system. The system was deployed on, the 21st day of November 2022, and the operation of the system its and capabilities are demonstrated by the researchers, that includes how the system works, how the clients can request an application using the system, how the system will notify the clients, how the staffs will process the applications, and who is responsible for entering certain types of data. Discussions as shown in Figure 28.



Figure 28 Deployment of the System



Feedback

The researchers produced and printed survey questionnaires during this phase, which they then distributed to their participants and IT specialists. The program was put to the test using the software quality criteria of ISO Standard 25010. The functionality of the system was described using the terms functional suitability, performance efficiency, usability, compatibility, reliability, maintainability, security, and portability.

Statistical Tool Used

To analyze the results of this study, the following statistical methods were applied.

Frequency - based on several factors, this was used to determine how many people took part in a statistical survey.

Percentage - this was used to figure out how many people responded. $P = F * 100 / N$ is the formula that is utilized.

Where: P = Percentage, F = Frequency, N = Total number of populations

Weighted Mean - mean describes how each questionnaire item was answered by the respondents. It makes sense after analyzing the responses of the respondents.

The majority of respondents assessed the functionality of the system as adequate for all the factors included in the table below. It was also said that the participants gave the functional sustainability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability compliance of the system all satisfactory ratings. The overall functionality of the system was found to be adequate with a general weighted mean of 3.57.

**Table 1 Overall System Evaluation**

CRITERIA	RATING = 126										MEAN
	5	%	4	%	3	%	2	%	1	%	
FUNCTIONAL STABILITY											
Functional Completeness	10	7.94%	80	63.49%	34	26.98%	2	1.59%	0	0%	3.78
Functional Correctness	6	4.76%	59	46.83%	58	46.03%	3	2.38%	0	0%	3.54
Functional Appropriateness	4	3.17%	63	50%	57	45.24%	2	1.59%	0	0%	3.55
General Weighted Mean Based on Functional Stability										3.62	
PERFORMANCE EFFICIENCY											
Time Behavior	11	8.73%	54	42.86%	56	44.44%	5	3.97%	0	0%	3.56
Resource Utilization	6	4.76%	54	42.86%	59	46.83%	7	5.56%	0	0%	3.47
Capacity	7	5.56%	60	47.62%	52	41.27%	6	4.76%	1	0.79%	3.52
General Weighted Mean Based on Performance Efficiency										3.52	
COMPATIBILITY											
Co-existence	3	2.38%	65	51.59%	56	44.44%	2	1.59%	0	0%	3.55
Interoperability	7	5.56%	61	48.41%	50	39.68%	7	5.56%	1	0.79%	3.52
General Weighted Mean Based on Compatibility										3.54	
USABILITY											
Appropriateness Recognizability	7	5.56%	65	51.59%	50	39.68%	4	3.17%	0	0%	3.6
Learnability	6	4.76%	61	48.41%	52	41.27%	6	4.76%	1	0.79%	3.52
Operability	11	8.73%	55	43.65%	53	42.06%	6	4.76%	1	0.79%	3.55
User Error Protection	9	7.14%	50	39.68%	58	46.03%	9	7.14%	0	0%	3.47
User Interface Aesthetics	7	5.56%	72	57.14%	45	35.71%	2	1.59%	0	0%	3.67
Accessibility	4	3.17%	71	56.35%	47	37.3%	4	3.17%	0	0%	3.6
General Weighted Mean Based on Usability										3.57	
RELIABILITY											
Maturity	8	6.35%	70	55.56%	46	36.51%	2	1.59%	0	0%	3.67
Availability	7	5.56%	66	52.38%	46	36.51%	7	5.56%	0	0%	3.58
Fault Tolerance	3	2.38%	63	50%	54	42.86%	6	4.76%	0	0%	3.5
Recoverability	12	9.52%	52	41.27%	54	42.86%	8	6.35%	0	0%	3.54
General Weighted Mean Based on Reliability										3.57	
SECURITY											
Confidentiality	11	8.73%	69	54.76%	39	30.95%	6	4.76%	1	0.79%	3.66
Integrity	7	5.56%	59	46.83%	51	40.48%	8	6.35%	1	0.79%	3.5
General Weighted Mean Based on Security										3.58	
MAINTAINABILITY											
Modularity	5	3.97%	62	49.21%	55	43.65%	4	3.17%	0	0%	3.54
Reusability	7	5.56%	55	43.65%	61	48.41%	3	2.38%	0	0%	3.52
Analyzability	6	4.76%	56	44.44%	60	47.62%	3	2.38%	1	0.79%	3.5
Modifiability	10	7.94%	60	47.62%	50	39.68%	5	3.97%	1	0.79%	3.58
Testability	10	7.94%	52	41.27%	59	46.83%	5	3.97%	0	0%	3.53
General Weighted Mean Based on Maintainability										3.53	

PORTABILITY											
Adaptability	15	11.9%	68	53.97%	41	32.54%	2	1.59%	0	0%	3.76
Installability	13	10.32%	62	49.21%	44	34.92%	6	4.76%	1	0.79%	3.63
Replaceability	9	7.14%	58	46.03%	52	41.27%	7	5.56%	0	0%	3.55
General Weighted Mean Based on Portability											3.65
GENERAL WEIGHTED MEAN											3.57

In Pilar, Bataan, 126 respondents, including MSWDO staff and IT professionals, participated in this survey. Table 2 displays their ratings of the Functional Suitability of the system. With an average mean score of 3.62, users saw that all necessary system capabilities were operating correctly.

Table 2 System Evaluation: Functional Stability

Functional Suitability	Average Mean	Descriptive Interpretation
Functional Completeness	3.78	Satisfactory
Functional Correctness	3.54	Satisfactory
Functional Appropriateness	3.55	Satisfactory
Mean	3.62	Satisfactory

In Pilar, Bataan, 126 respondents, including MSWDO staff and IT professionals, participated in this survey. Table 3 displays their ratings of the Performance Efficiency of the system. With an average mean score of 3.52, users saw that system performs well

Table 3 System Evaluation: Performance Efficiency

Performance Efficiency	Average Mean	Descriptive Interpretation
Time Behaviour	3.56	Satisfactory
Resource Utilization	3.47	Average
Capacity	3.52	Satisfactory
Mean	3.52	Satisfactory

In Pilar, Bataan, 126 respondents, including MSWDO staff and IT professionals, participated in this survey. Table 4 displays their ratings of the Compatibility of the system. With an average mean score of 3.54, users saw that the system can be accessed from a browser.

Table 4 System Evaluation: Compatibility

Compatibility	Average Mean	Descriptive Interpretation
Co-existence	3.55	Satisfactory
Interoperability	3.53	Satisfactory
Mean	3.54	Satisfactory

In Pilar, Bataan, 126 respondents, including MSWDO staff and IT professionals, participated in this survey. Table 5 displays their ratings of the Usability of the system. With an average mean score of 3.57, users understand well the system concept.

Table 5 System Evaluation: Usability

Usability	Average Mean	Descriptive Interpretation
Appropriateness	3.6	Satisfactory
Recognizability		
Learnability	3.52	Satisfactory
Operability	3.55	Satisfactory
User Error Protection	3.47	Average
User Interface Aesthetics	3.67	Satisfactory
Accessibility	3.6	Satisfactory
Mean	3.57	Satisfactory

In Pilar, Bataan, 126 respondents, including MSWDO staff and IT professionals, participated in this survey. Table 6 displays their ratings of the Reliability of the system. With an average mean score of 3.57, users have observed that the system shows off its aptitude for alerting users when an entry is necessary.

Table 6 System Evaluation: Reliability

Reliability	Average Mean	Descriptive Interpretation
Maturity	3.54	Satisfactory
Availability	3.52	Satisfactory
Fault Tolerance	3.5	Satisfactory
Recoverability	3.54	Satisfactory
Mean	3.57	Satisfactory

In Pilar, Bataan, 126 respondents, including MSWDO staff and IT professionals, participated in this survey. Table 7 displays their ratings of the Security of the system. With an average mean score of 3.58, users found that the system is secured with a one-time pin.

Table 7 System Evaluation: Security

Security	Average Mean	Descriptive Interpretation
Confidentiality	3.66	Satisfactory
Integrity	3.5	Satisfactory
Mean	3.58	Satisfactory

In Pilar, Bataan, 126 respondents, including MSWD staff, and IT professionals, participated in this survey. Table 8 displays their ratings of the Maintainability of the system. With an average mean score of 3.53, users noticed that the system can be tested easily.

Table 8 System Evaluation: Maintainability

Maintainability	Average Mean	Descriptive Interpretation
Modularity	3.54	Satisfactory
Reusability	3.52	Satisfactory
Analyzability	3.55	Satisfactory
Modifiability	3.58	Satisfactory
Testability	3.53	Satisfactory
Mean	3.53	Satisfactory



In Pilar, Bataan, 126 respondents, including MSWDO staff and IT professionals, participated in this survey. Table 9 displays their ratings of the Portability of the system. With an average mean score of 3.65, users noticed that it can be accessed on any device.

Table 9 System Evaluation: Portability

Portability	Average Mean	Descriptive Interpretation
Adaptability	3.76	Satisfactory
Installability	3.63	Satisfactory
Replaceability	3.55	Satisfactory
Mean	3.65	Satisfactory



CHAPTER V

SUMMARY, CONCLUSION, AND RECOMMENDATION

The major purpose of this chapter is to review the study that was done. The goal of the study, a restatement of the research questions, the methodology, a summary of the findings, conclusions, and a discussion are all included in this overview. This chapter offers suggestions for the next research projects and potential modifications. This chapter provides a summary of the findings of the study, the inferences drawn from them, and the suggestions made by the researchers in light of the findings.

Summary

The Web-based Financial Aid System for Municipal Social Welfare and Development Office of Pilar, Bataan method offers quick and efficient techniques. The goal of this initiative is to help people save time and even a little amount of cash. This methodology is quicker and more user-friendly for the clients than the traditional approach. It provides the user with an easier way of applying for financial assistance. It has tracking details where the user can keep an eye on their application even if they are at home. It will also help the staffs process the application and help them in their tasks like searching for records and creating reports.

The researchers polled 126 people in the Pilar municipality. Three (3) IT professionals resided in a different area and 123 respondents were the people of Pilar. The survey forms were distributed to test participants throughout the testing phase to collect feedback on the system.



Research Methodology

The researchers utilized a mix of descriptive study and survey methods to collect data from the Municipality of Pilar. To ascertain what they observed in the system, the survey replies of the respondents were analyzed. The researchers used Agile Methodology. The six phases of Agile Methodology are Plan, Design, Develop, Test, Release, and Feedback.

Summary of Agile Methodology

1. Planning Phase

The researchers went to Municipality Social Welfare and Development Office (MSWDO) in Pilar, Bataan to deliver a letter of proposal to Ms. Jenny Lee Casin and she help us to reach Hon. Charlie Pizarro for conducting research alongside them and for their intended beneficiaries. A broad specification of the system requirements in terms of the functions that the system would support was established by this study.

2. Designing Phase

The researchers assessed the functionality, usability, and performance of the present system. A Use Case Diagram and Data Flow Diagrams are created to illustrate the link between the entity and system operations, respectively, to complete the study. And entity relationship diagrams, which are very helpful when creating a relational database since they demonstrate how data is connected broadly.

3. Developing Phase

The proponent finished the design and construction of the system during this phase. The following technologies were used by the researchers to evaluate the



software implementation and fine-tune the requirements: HTML, CSS, PHP, MySQL, JavaScript, Bootstrap, Semaphore, and Web host. HTML or Hypertext Markup Language is the foundation of the system. CSS or Cascading Sheet is used to design the system. The system is dynamic and interactive thanks to PHP or Hypertext Preprocessor and JavaScript. Bootstrap data tables are used for populating records from MySQL which is used for the database. Semaphore is used to send automated SMS with just button clicks and a web host to upload the system through the internet.

4. Testing Phase

To ensure that the system is fully functional, the researchers together with IT professionals did a variety of tests. If any potential flaws or vulnerabilities are found, the developers will immediately fix them. At this time, the researchers also received feedback from the IT professionals who did the testing.

5. Releasing Phase

The researchers now relinquished control to the beneficiary. The product release procedure comes after a successful testing phase. Now that the program has been fully distributed, users may access it. The software development team provides ongoing assistance throughout this phase to guarantee that the system keeps functioning properly and that any new flaws are fixed. It is possible to do further iterations in the future to improve a current product or add new features.

6. Feedback

The researchers created and printed survey questionnaires that were delivered to their 123 participants and 3 IT professionals. Software quality criteria



specified in ISO Standard 25010 were used to test the program. Functional Suitability, Performance Efficiency, Usability, Compatibility, Reliability, Maintainability, Security, and Portability were used to describe the functionality of the system. Many of them said the system may be helpful to them, but they also said it needed further revisions to make it more user-friendly, particularly in terms of design and small tweaks and improvements to system speed.

Conclusion

The findings of the study showed a positive perception with a satisfactory rating by 126 respondents. The functions of the system were characterized using the following qualities, which were based on ISO 25010 software quality standards: Functional Sustainability, Performance Efficiency, Compatibility, Usability, Reliability, Security, Maintainability, and Portability.

With the help of IT professionals, MSWDO staff, and residents from Pilar, Bataan, the researchers carried out the real demonstration and final testing. Many of them said the system may be helpful to them, but they also said it required further revisions to make it more user-friendly, particularly in terms of design and small tweaks and improvements to system speed.



Recommendations

The following recommendations are given to improve the project based on the study and analysis of survey results as well as physically discovering specific difficulties with the help of professionals.

1. Rescheduling of appointments
2. Profile page of users
3. Client to MSWDO staff chat function

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APPENDIX A

INTERVIEW TRANSCRIPT

(Summary Transcript)

INTERVIEW TRANSCRIPT

Interviewer: Good Day! We are 4th year students from Eastwoods Professional College of Science and Technology. We are here to propose the web-based system that will be developed by us. We will explain the functionalities of our system that may help you minimize the workloads in processing the financial assistance applications. We will ask you some questions that will be our basis to develop the system.

Interviewee: Okay, what is that system?

Interviewer: Sure, but before we explain the system to you, can we ask few questions first?

Interviewee: During our first interview to your staff, she stated that the processing of financial assistance is done manually. How do you manually process the applications?

Interviewee: For those who will apply for financial assistance must go to our office for the requirements. They should provide the original and hard copy of the documents. Once the requirements had completed, we will conduct an assessment that will be our basis if the application client should be approved or not. Then we will issue a certificate that will be submitted to the mayor's office together with the documents. The client will receive a call from the mayor's office when they will return.

Interviewer: After that, do you have databases or how do you store data or records?

Interviewee: We don't have database. We only use logbook.

Interviewer: What if you need to retrieve some data?

Interviewee: We search for it manually through logbook or papers. We will ask the client the month when they last applied.

Interviewer: How about reports? How do you make reports?

Interviewee: We make reports by counting the data stored in log books manually. That's how hard we work here.

Interviewer: Okay ma'am, with our system, the process will be more efficient and quicker. The client will create and log in their account then, they can use the system to request for financial assistance easier. The requirements will be displayed in the system so that no need for them to go to the office to ask for the requirements. There will also be an appointment system to prevent crowd of people. They can also track their application through the system.

Interviewee: That means they will only go here for assessment and issuance of their assistance?

Interviewer: Yes. The system will help you process their application. You can monitor their application in the system and see if it is approved by mayor or not. It will also generate reports with just a click which will help you and the staffs save a lot of time.

Figure 29 Interview Transcript Page 1



Interviewee: That will be good for us. That will help us a lot.

Interviewer: Thank you so much for your time. We are grateful that you liked it. We will try our best to deploy it as soon as possible.

Interviewers:

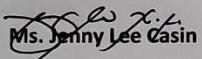
Marlou Nava

Jonalyn Salas

Jemmel Pizarro

Danica Pepito

Interviewee:



Ms. Jenny Lee Casin

Head, Municipal Social Welfare and Development Office

Figure 30 Interview Transcript Page 2



APPENDIX B

SURVEY FORM

Evaluation Tool (Adapted from ISO 25010)

Evaluation Tool for User Acceptability

(Adapted from ISO 25010)

WEB-BASED FINANCIAL AID SYSTEM FOR MUNICIPAL SOCIAL WELFARE AND
DEVELOPMENT OFFICE OF PILAR, BATAAN

Respondent's Profile:

Name: _____

Position / Profession: _____

Municipality/City: _____

QUESTIONNAIRE

Please indicate a check mark (✓) under the column that best describes your responses for each item about the Web-based Financial Aid System for Municipal Social Welfare and Development Office of Pilar, Bataan.

Please use the rating below:

- 5 – Very Satisfactory
- 4 – Satisfactory
- 3 – Average
- 2 – Poor
- 1 – Very Poor

Figure 31 Survey Form Page 1



Please start answering here:

Criteria	Ratings				
	5	4	3	2	1
FUNCTIONAL SUITABILITY					
Functional Completeness - Functionality covers the required tasks					
Functional Correctness - System provides the appropriate results with accuracy					
Functional Appropriateness – System functions accomplishes the desired tasks and objectives					
PERFORMANCE EFFICIENCY					
Time Behavior - Response and processing time is at acceptable rate when performing specific functionality					
Resource Utilization - Amounts and types of resources used by the system, when performing its functions, meet requirements of the user					
Capacity – Limitations like internet speed, size of database and processing time do not affect the overall performance of the system					
COMPATIBILITY					
Co-existence – The system works well with different platforms like different operating system and web browser					
Interoperability – System works well when exchanging information with different units of the organization					
USABILITY					
Appropriateness Recognizability – Manuals, tutorials, demonstration and other documentation for the use of the system are appropriately provided.					
Learnability – Use of the system is easily learned by the intended users					
Operability – Functions of system are designed to be easily adaptable for users					
User Error Protection - System protects users against making errors					

Figure 32 Survey Form Page 2



User Interface Aesthetics – User interface like its colors and icons enables pleasing and satisfying interaction for the users					
Accessibility – System can be easily accessed by intended users either by internet or intranet.					
Criteria		Ratings			
		5	4	3	2
RELIABILITY					
Maturity – System component meet the needs for reliability under normal operation					
Availability – System component is operational and accessible when required for use					
Fault Tolerance – System component operates as intended despite the presence of hardware or software faults					
Recoverability - In the event of an interruption or a failure, the system can recover the data directly affected and re-establish its normal state					
SECURITY					
Confidentiality – System ensures that data are accessible only to those authorized users					
Integrity – System prevents unauthorized access to, or modification of, computer programs or data					
MAINTAINABILITY					
Modularity – System failure of one component has minimal impact to another parts of the computer program					
Reusability – Data from another parts of the system are easily shared with other units or entities					
Analyzability – Errors or failures of the system is easily diagnosed and mechanism to determine cause of failures are easily identified.					
Modifiability – System can be effectively and efficiently modified without introducing defects or degrading existing quality					
Testability – Effectiveness and efficiency with which test criteria can be established for the system and tests can be performed to determine whether those criteria have been met					

Figure 33 Survey Form Page 3



Criteria	Ratings				
	5	4	3	2	1
PORTABILITY					
Adaptability – System can effectively and efficiently be adapted for different or evolving hardware, software or other operational or usage environments					
Installability – Effectiveness and efficiency with which the system can be successfully installed and/or uninstalled in a specified environment					
Replaceability – System can replace another software for the same purpose in the same environment					

Signature over printed name of Respondent

Date

Figure 34 Survey Form Page 4



APPENDIX C
ACTUAL SURVEY AND PASSING OF PROPOSAL LETTER



Figure 35 Passing of Proposal Letter



Figure 36 Interview and Survey

APPENDIX D
ACTUAL SYSTEM SCREENSHOTS



Figure 37 Interview and Survey

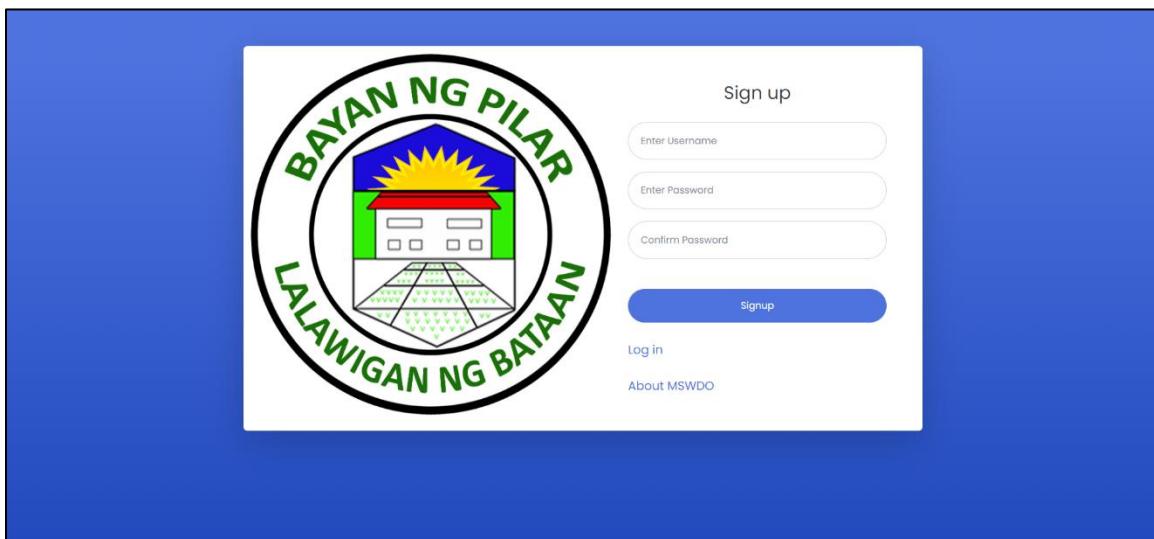


Figure 38 Registration/Signup Page



Submit an Application

Type of Assistance

Select

Personal Information

Name
Marliou Palibe Nava

Contact Number (+63*****)
9128585519

Address(house no. street barangay)
ADDRESS

Age
AGE

Date of Birth
mm/dd/yyyy

Occupation
OCCUPATION/INCOME

Civil Status
Select

SEX
Select

Relation to Patient/Deceased
Select

Appointment Details

Appointment Date
DATE OF APPOINTMENT
2023-01-12

Appointment Time
10 AM

Figure 39 Submission of Application

Appointment Details

Appointment Date
2023-01-12

Appointment Time
10 AM

January							February						
Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7				1	2	3	4
8	9	10	11	12	13	14	5	6	7	8	9	10	11
15	16	17	18	19	20	21	12	13	14	15	16	17	18
22	23	24	25	26	27	28	19	20	21	22	23	24	25
29	30	31					26	27	28				

Submit

Figure 40 Setting of Appointment



ADMIN

MUNICIPAL SOCIAL WELFARE AND DEVELOPMENT OFFICE PILAR

Applications

- Financial Assistance
- Solo Parent ID
- Senior Citizen ID
- Add Membership

Membership List

Staff

Clients

Calendar

Reports

[Logout](#)

Financial Assistance Applications

Show 10 entries Search: Show All

Application No.	Customer Name	Assistance Type	Home Address	Occupation	Relation to Patient	Application Status	Action
No data available in table							

Showing 0 to 0 of 0 entries Previous Next

Figure 41 Admin Page

MAYOR'S OFFICE

MUNICIPAL SOCIAL WELFARE AND DEVELOPMENT OFFICE PILAR

Applications

Reports

- Monthly Report
- Yearly Report

Logout

List of Applications

Show 10 entries Search:

Application No.	Customer Name	Assistance Type	Home Address	Occupation	Relation to Patient	Application Status	Action
MSWD63B4EDFFE9FF6	Mariou Palibe Nava	Medical	29 Santa Rosa Pilar Bataan	Student	Wife	Approved by Mayor	View Application

Showing 1 to 1 of 1 entries Previous 1 Next

Figure 42 Office of the Mayor Page



APPENDIX E

CERTIFICATION OF DEPLOYMENT

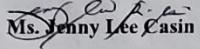


No. 1 in IT Education in BATAAN
Ibayo, City of Balanga, Bataan
(047)-237 4334 | (047)-791 2791

CERTIFICATION OF DEPLOYMENT

This is to certify that a Web-based Financial Aid System for Municipal Social Welfare and Development Office of Pilar, Bataan of these BSIT 4th year namely. **Marlou Nava, Jonalyn Salas, Jemmel Pizarro, and Danica Pepito** of College of Information Technology is accepted for Deployment.

Issued this 21st day of November 2022, at Municipal Social Welfare and Development Office Pilar, Bataan.


Ms. Jenny Lee Casin
Head, MSWDO Pilar

EASTWOODS Professional College of Science and Technology
"We Educate, Develop, and Inspire"

Figure 43 Certification of Deployment



Figure 44 Signing of Certification of Deployment



PROFILE

I am an adaptable individual looking for work that will support my progress and usage of my current talents. I like using my abilities to add value to the workforce and I am able to work independently or as part of a team.

CONTACT

PHONE:
+639128585519

EMAIL:
marloupnava@gmail.com

HOBBIES

- Playing Video Games
- Social Media
- Listening to Music

MARLOU PALIBRE NAVA

EDUCATION

Santa Rosa Elementary School

2005 - 2011
1st Honorable Mention – 2007
3rd Honorable Mention – 2011

Pablo Roman National High School

2011 - 2015

Eastwoods Professional College of Science and Technology

2019 – 2023

BADGES

Microsoft Office Specialist

Microsoft Word 2016
2019

CERTIFICATES

Computer Engineering: The Run Through

March 2022

Web System and Technologies 101

June 2022

SKILLS

- Computer System Maintenance
- Microsoft Office
 - Word
 - Excel
 - Powerpoint
 - Publisher
- Computer Literate
- Adobe Photoshop
- Web Development



PROFILE

I am a capable, dependable, hard-working individual who can complete assignments whether working alone or as a team.

CONTACT

PHONE:
+639272508383

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jonalynsalas13@gmail.com

JONALYN ERNI SALAS

EDUCATION

Naic Elementary School
2001 - 2004

Amaya School of Home Industries
2004 - 2008

Eastwoods Professional College of Science and Technology
2019 – 2023

BADGES

Microsoft Office Specialist
Microsoft Word 2016
2019

EMPLOYMENT HISTORY

Jsalas Events Management and Services
Proprietor - Since 2017

SKILLS

- Microsoft Office
 - Word
 - Excel
 - Powepoint
 - Publisher
- Computer Literate



PROFILE

I am Jemmel Villeza Pizarro. I am a person that puts in a lot of effort and is enthusiastic, self-motivated, dependable, and accountable. I am a trustworthy team player that can easily adapt to any challenging situations. I can operate effectively both in a group setting and on my own initiative. Even when pressed for time, I am able to stay focused and accomplish deadlines.

CONTACT

PHONE:
+639637373325

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Pizarrojemmel23@gmail.com

HOBBIES

- Social Media
- Listening to Music

JEMMEL VILLEZA PIZARRO

EDUCATION

Pilar Elementary School
2007-2012

Pablo Roman National High School
2013-2018

Eastwoods Professional College of Science and Technology
2019 – 2023

SKILLS

- Microsoft Office
 - Word
 - Excel
 - Powepoint
 - Publisher



PROFILE

I am Danica Caraballe Pepito. I am a job seeker who is dedicated, hardworking, reliable and organized with a positive outlook. Passionate eager to work hard, pay close attention to details and have solid organizational abilities in order to contribute to the success of the team.

CONTACT

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+639466689587

EMAIL:
pepitodanica09@gmail.com

HOBBIES

- Social Media
- Listening to Music

DANICA CARABALLE PEPITO

EDUCATION

Mabuhay Elementary School
2007-2013

Tanque National High School
2013-2019

Eastwoods Professional College of Science and Technology
2019 – 2023

BADGES

Microsoft Office Specialist
Microsoft Word 2016
2019

CERTIFICATES

Entrepreneur Certificate
2018

SKILLS

- Microsoft Office
 - Word
 - PowerPoint