Technological University of the Philippines
Taguig Campus

e-Alaga: A Web and Mobile Public Health Care Management System for Taguig City's Center for the Elderly

Project in Capstone Project I

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Chapter 1

THE PROBLEM AND ITS BACKGROUND

1.1. Introduction

The e-Alaga is a health care management system and compatible for both web and mobile applications. The application is a custom-made software for the pioneer wellness hub center for elderly which was open in Taguig City, Philippines. As a healthcare management system, the application was designed to help center's personnel to collect, store, fetch the elderly's information and provide them with care and services the center is offering. The elderlies are the current citizen of the city whose age are often sixty-five years old or more and the primary beneficiary of the wellness hub.

The creation of the e-Alaga application would produce an alternative and accessible platform to deal with the current traditional process of inquiring, queuing, and acquiring the center services. Moreover, the application would improve the work of the personnel and the general process of offering and catering the center's services.

The data gathered from the conducted interview with the center will provide the researchers with further requirements in developing the software. Through the application clients may choose a health care service the center is providing such as therapy pool, sauna, gym, yoga, massage room etc. to further cater the client's needs. Clients can pick and set a schedule and decide whether the service is to be in the long term or short term. The clients may finalize the booking details and confirm the appointments and wait for the center personnel to approve the requested services.

1.2. Background of the Study

The Taguig City's Center for the Elderly is the new five-story building wellness hub opened in 2019 and located at Ipil-Ipil, North Signal Village which offers relaxation for the Taguigeño's elderlies. The center's first floor is composed of a therapy pool, an open space for exercises, a conference room, offices, clinic, and PWD- friendly restrooms. The second floor is where the massage room, saunas, ballroom, Zumba, yoga room, gym, and a lounge where the elderly can relax are located. The third floor is for dialysis while the fourth floor is the multipurpose hall. Lastly, the fifth floor has a cinema with cozy couches and a partition of a rooftop garden which makes one appreciate life in the city.

The wellness hub center currently has non-existing or deployed application and website that allows the public and elderlies of the city to conveniently apply for the services of the center. The wellness hub currently utilizes the traditional way of approaching the beneficiary. Therefore, the researchers have seen the opportunity to develop custom-made software to produce an accessible and user-friendly platform that will serve as bridge between the center and the elderly.

1.3. Statement of the Problem

Having physical contact with other people in various situations such as transactions is still a significant concern for everyone in this pandemic, especially for those elderly with medical issues. Considering the health condition of elderly and the possible risks they might encounter. It is extremely dangerous to expose themselves outside in performing various amendments.

The researchers of this study aim to find solutions to the existing concerns such as the center's services not being well known to many, traditional way of transaction and storing client's information. Possible solutions that will make them less likely to expose themselves only to arrange an appointment at the center for the elderly to avail themselves of the center's services.

1.4. Project Objective

1.4.1. General Objective:

For the researchers to develop a web-based and mobile application that meets the client's requirement that would serve as bridge between the elderly and the center. A platform that eases the inconvenience for the elderly in physical queuing and the center's personnel with their work of manually processing the transaction.

1.4.2. Specific Objectives:

1 Create an application with user friendly interface.

2 Determine the maximum capacity of the center to accommodate the elderly and implement it with the components of the application.

3 Determine the protocols of the center for the elderly with special conditions and apply it with the structure of the system.

4 Innovating the traditional way of transaction including the automation of approval to minimize the human intervention of the center's personnel and develop a countermeasure for the user's inappropriate behavior.

5 Create a platform that will promote the very existence of the center and serve as a means of communication for the center to reach the people and vice versa.

6 Offer Database Management System (DBMS) with CRUD function that will be tremendous help in managing and modifying data.

1.5. Significance of the Study

The e-Alaga software is significant and would benefit the following:

1. **Center for the Elderly** – The system will automate the center's task and equip the center with a system that can manage the client's information and provide them with necessary information.
2. **The Center's Personnel** - The system will lessen the works that needs to be done in processing the application of the clients in availing the center's services.
3. **Elderly –** The system will provide an application that would serve as platform that may help them conveniently choose the health services, they want such as a therapy pool, sauna, gym, yoga, massage room and other services available in the center remotely.
4. **Future Researcher –** For the future researchers that would like to create a similar system for a certain organization or individual. They may use the study as reference to either innovate the existing system or create a new one.

1.6. Scope and Delimitation of the Study

1.6.1. Scope

1. The system is exclusive for eligible senior citizens residents of City of Taguig and categorized as the primary beneficiaries of the center.
2. The system manages senior citizens' health records and personal information.
3. The system can be used by the personnel of Center for the Elderly
4. The system records any transactions of the senior citizens into the database.
5. The system covers the available schedule of the center and the available services the center is offering.
6. The system has the feature that generates reports.
7. The system can be used to accept donations from registered users and guests.
8. The e-Alaga is also available in web and mobile applications.

1.6.2. Delimitation

The following are the delimitations of the project study e-Alaga: A Web and Mobile Public Health Care Management System for Taguig City's Center for the Elderly.

1. The e-Alaga application is only accessible when internet access is present.
2. The application is not compatible with all mobile operating systems and only limited to android mobile operating system.
3. Only authorized personnel can generate reports.
4. The application does not cover health consultation.

1.7. Functional Requirements

The following are the abilities of the e-Alaga: A Web and Mobile Public Health Care Management System for Taguig City's Center for the Elderly

Users / Senior Citizens

1. Register and create an account with email authentication through web and android mobile application.
2. Login account through web and android mobile application.
3. Edit user's own profile account and upload required documents.
4. Select services and schedule through web and android mobile application.
5. View and monitor user's own schedule and activities.
6. Message the center through chat feature available on web application.
7. Gives review or feedback on center's services.
8. Donates to the center through web and android mobile applications.

Center's Personnel

1. Login account.
2. View and search the user's account.
3. View, search, and filter schedules.
4. View, filter per services, search, save and delete senior citizen appointment.
5. Edit, search, view the center schedule.

6. Add/edit/view services.
7. Monitors the attendee's senior citizen activities.
8. Message the senior citizen through the chat feature available on webapplication.
9. View, search and approve jobs applicants.
10. View and print analytics and reports.

Center's Admin

1. Create a login account for the center's personnel through the web app.
2. Login account.
3. Message the users through chat feature available on web application.
4. Access to Users CRUD.
5. Access to Services CRUD.
6. View and print analytics and reports.

1.8. Non- Functional Requirements

1. Verification of senior citizen account.
2. The senior citizen needs to upload required documents and complete the profile account.
3. Confirmation with either QR code or text-based format.
4. Notification of senior citizen scheduled.
5. User can recover the login account.

6. Admin can recover and delete the personnel login account.
7. The system is available all the time to check the available schedule per day.
8. A dashboard or an online interface that displays real-time data as insightful charts and tables.
9. A component that will display the center's announcement.
10. Collect user's feedback on e-Alaga and center with a review platform.
11. Allows qualified interested individuals to join the center's team.
12. Filtering and recommending services based on user's health condition information.
13. Warning and further restriction for user's account as penalty for agreement violations.

1.9. SWOT Analysis

STRENGTHS

- Easy to access anytime and anywhere.
- A user-friendly interface allows users to use the web and mobile applications easily.
- Responsive design where the webpage can be viewed using different devices such as laptops, tablets, and phones.
- Automated approval process of booking appointments for healthcare services will help eliminate delays, reduce employee workload, and save time.
- Only authenticated users can access their protected resources.
- Countermeasure for those who didn't appear on the day of the appointment.

WEAKNESSES

- The web and mobile applications are highly dependent on the internet.
- The mobile application is only available on android.
- The users must download the mobile application first before they can use it.
- Booking an appointment for healthcare services is a limited slot only.

OPPORTUNITIES

- The web and mobile application could be used by other centers.
- e-Alaga could be media promotion and gaining an impression for other centers.
- Establishing a strong relationship with the local government and private companies.

THREATS

- Destroy or modify the system by hackers.
- Leaking of user information due to cyber-attacks.
- Negative reviews that can turn off the user from trying the system.

Chapter 2

REVIEW OF RELATED

LITERATURE AND STUDIES

Chapter 2

REVIEW OF RELATED LITERATURE AND STUDIES

2.1. Related Local Literature

Azuelo et al. (2021) studied the database management system and the sustainability of local government unit of La Carlota City in adopting with technology advancement. The study focuses on the advantages of the database management system and how it assists the LGU in processing the business permits amid pandemics. The study concluded based on the conducted test that acquiring business permits through conventional process caused inconvenience to the business owner due to the government offices which are located on distinct areas. The business owners agreed that implementation of the database management system would lessen the inconvenience brought by the business permit application. However, the study showed that there was no existing database management system that would support the transaction because the LGU could not afford the cost and there was no official ordinance that could sustain it.

Alvarez et al. (2017) studied the needs and quality care among family caregivers and elderly patients of Guadalupe, Cebu City in the Philippines. The study focused on learning the needs among family caregivers, quality of care, and services they should offer to the elderly.

The study does not offer a complete resolution to the elderly care problem, but an intensive evaluation of the situation and the learning needs of the family caregivers in taking care of their elderly. As a result of the conducted test, women are mostly handling caregiving jobs. Similarly, there were more female elderly patients than male elderly patients, with about three-quarters of them have completed high school or a lower level of education. The findings also revealed that family caregivers possessed very good attitudes and values and were good in terms of knowledge and skills. The study concluded that understanding the nature, medical conditions, medication administration, caregiving techniques, diet and nutrition, ambulation techniques and strategies, financial support from peers, and total care management of elderly patients were much more effective way of learning needs among family caregivers. Moreover, learning should be based on information, skills, attitude, and values to prevent caregivers from experiencing sadness, desperation, and self-isolation.

In 2020, Itagaki et Al proposed a web-based booking system for Style Studio. As a result of the conducted test, the manual booking system of the said salon encountered many problems. They noticed that the manual booking system was ineffective and inefficient to their business process because they only have a few employees, which causes losing sales opportunities due to often occurring long lines causing the client to get impatient and switch to another salon.

As the result of the observation of the existing manual booking system, the researcher concluded that the Style Studio, particularly the manual booking system, must be developed through a web-based online booking system for better service. This platform will benefit clients, staff and Style Studio. The client will be hassle-free to book their preferred services anytime and anywhere; they no longer have to line up and wait for their turn. The staff will reduce their workload. The Style Studio will increase the number of their customers. And for this reason, the researchers highly recommended the web-based booking system, which will be easy, faster and more efficient in processing their booking process with the customer.

Calumpang et al. (2016) evaluated the framework on system security requirements for government-owned agencies in the Philippines. The study was conducted in San Fernando City; La Union which focused on the criteria that evaluates the information system security requirements and the criteria for the Philippines' information system security requirements. As a result of the conducted test which involved descriptive type of research, the generated table shows the level of security in terms of criteria. The level of security in terms of minimum security and protection requirements is extremely high as evidenced by the mean rating of 5.00. The study concluded the evaluation criteria for the Philippines information system security requirements were Minimal protection/the minimum-security requirements which consist of 17 security-related areas.

In 2019, Calindong et al. proposed a hospital management system: Core Transaction 3 which is composed of medical records, pharmacy, medical package management and diet management. The study focused on the medical clinic activities, such as storing data manually which leads to information redundancies, and the conventional transactions that slow the process. The study resolves the various issues and needs of the clients as far as overseeing documents and taking care of each and every patient's and client's needs. As the result of the conducted test, Core Transaction Part 3 would be a great help to the respective users in every transaction, managing files, and presenting reports in graphical forms easily, accurately and more organized.

2.2. Related Foreign Literature

In 2022, Raj et al. explored the importance of software engineering in software development and the problems that arise which resulted to poor quality of the software products. The study explained that the duration of the development and the allocated budget to the development tremendously affects the quality of the software. However, the study also stated that through the implementation of the concept of software engineering the development of the software might progress smoothly. Moreover, the concept of the software engineering could help the developers to determine the technical and operational feasibility which influence the software products because it

is a concept which is being practiced in the software industry in order to content the requirements of the end users.

Achuthan (2022) explored the two processes in the business world: manual and automated. The study found that some problems exist in the manual process such as the manual process is time-consuming because it requires a human to review all the transaction details before they can approve it, the manual processes are inaccurate and slow and the manual process causes delay. The use of automation will help the business, employees, and customers to make it easier because the automated process is completed faster than by manual process. After all, the system is programmed to auto-verify the task. Automating the system will help the customer process all the transactions without any delay and wait for the confirmation process. Automating the system will reduce the workload and minimize the employee's errors. The automated process will give advantages to businesses because it will make the transaction much easier and more accurate.

Aliz (2020) suggested user authentication in different web and mobile applications in today's digital world is essential because of many challenges, including safety, data privacy, and personal security threats. User authentication is the process of recognizing the user and ensuring that the user is who they claim to be by using their username and password. It will help the company protect its customers' information privacy and resources.

Authentication assures information security, access control, and system security in today's digital world.

In 2019, Mathiason et al. conducted a study regarding progressive web apps and other mobile developing techniques and its comparison. The study focused on defining cross-platform applications, web application and the native apps. It also entails the methods of converting web app into progressive web application and the uniqueness of the respective application based on the performance. The study mentioned in developing an application for android and IOS generally expects to assemble two various renditions. The two options are both expensive and time-consuming which has prompted the production of many choices; one such option is to utilize a Moderate Web Application which could be assembled like Standard Web Application and incorporated with Native apps. Mobile users would spend multiple times on mobile applications compared to web applications. Furthermore, the study demonstrates Web and Mobile applications are significant for a company particularly when they are drawing in a ton of clients. The software industry must develop multiple applications as clients are in need of a mobile version of the available website.

Heitkötter et al. (2013) evaluated the cross-platform development approaches for mobile applications. The study focused on the comparison of two or more approaches for Cross-Platform application development and mentioned different functions of mobile phones such as media players and GPS with advanced computing

abilities particularly the touchscreens devices that gathered even more increasing popularity.

Because of the innovative system that is often referred to as apps, the markets of operating systems for mobile phones were divided and rapidly affects the evolution of all platforms that are still in use today and are less concentrated due to the programs differ significantly from each other. Software developers that need to attract an enormous crowd of users would be expected to create the apps for each platform independently.

2.3. Conceptual Framework

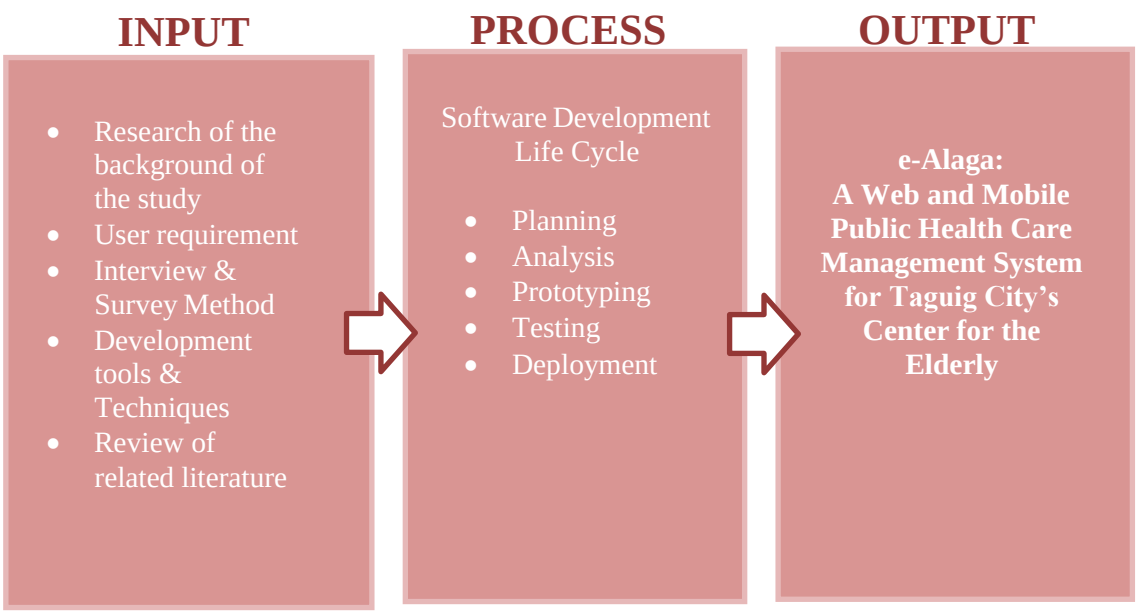

Figure 2-1 Conceptual Framework of e-Alaga: A Web and Mobile Public Health Care Management System for Taguig City's Center for the Elderly

Figure 2 – shows the development phases of the eAlaga application.

2.4. Definition of Terms

Admin - is a person who is responsible for the upkeep, configuration, and reliable operation of computer systems, especially multi-user computers, such as servers.

Appointment - an arrangement to meet someone at a particular time and place.

Authentication - an arrangement to meet someone at a particular time and place.

Automation - describes a wide range of technologies that reduce human intervention in processes.

Booking - an act of reserving accommodations, travel, etc., or of buying a ticket in advance.

Crud -- In computer programming, create, read, update, and delete are the four basic operations of persistent storage.

Customer - a person or thing of a specified kind that one has to deal with.

Client - a person or thing of a specified kind that one has to deal with.

Data - facts and statistics collected together for reference or analysis.

Dashboard - is an online interface, or page in your website, that displays real-time data as insightful charts and reports.

Digital world - most commonly used in defining digital fluency, and digital literacy.

Documents - a piece of written, printed, or electronic matter that provides information or evidence or that serves as an official record.

Database - an organized collection of data stored and accessed electronically.

Employee - person employed for wages or salary, especially at nonexecutive level.

Elder – a person with age of exactly or above 65 years old.

Framework - an essential supporting structure of a building, vehicle, or object.

Graphical - relating to or in the form of a graph.

Homepage - the introductory page of a website, typically serving as a table of contents for the site.

LGU - a local government unit which is a political subdivision of the Republic of the Philippines at the provincial, city, municipal, or Barangay level.

Mobile app - is a computer program or software application designed to run on a mobile device such as a phone, tablet, or watch.

Personnel - people employed in an organization or engaged in an organized undertaking.

Program - a series of coded software instructions to control the operation of a computer or other machine.

Platform - a series of coded software instructions to control the operation of a computer or other machine.

Report - is a document that presents information in an organized format for a specific audience and purpose.

Schedule - a plan for carrying out a process or procedure, giving lists of intended events and times.

System - a set of things working together as parts of a mechanism or an interconnecting network.

Software - the programs and other operating information used by a computer.

Security - protection from, or resilience against, potential harm caused by others, by restraining the freedom of others to act.

Services – describes work that supports an organization but does not produce a tangible commodity.

Senior citizen – someone who is retired and living on a pension and age is or above 60 years old.

Transaction - an exchange or interaction between people.

User - a person who uses or operates the application.

Chapter 3

RESEARCH METHOD

AND

PROCEDURES

Chapter 3
RESEARCH METHOD AND PROCEDURES

3.1 Methods of Research Used

The researcher used the quantitative methods as the means of conducting the research. The researcher intended to get the data that would be tremendously help in achieving the objective of the study. Moreover, to acquire information that would influence the development of the software.

Sheard (2018) referred to quantitative research as a method that deals with data thatare numerical or that can be converted into numbers. He defined statistics as the basic methods utilized in investigating data in a numerical form.

3.2. Respondents

The respondents of the study were composed of 30 senior citizens from the four selected barangays in Taguig City and the main beneficiary of the Center for the Elderly. The respondents have the knowledge and suggestions the researchers needed to satisfy the objectives of the study. The four selected barangays are the Central Signal, North Signal, South Signal, and Western Bicutan.

The selected barangays were chosen through the consideration of how convenient, suitable, and applicable they would be for conducting the research. The researchers selected the sample through stratified random sampling method, as this technique is suitable for selecting the sample size from four barangays in Taguig city respectively.

3.3 Research Instrument

In the study, the researchers used both questionnaires and interviews for data and requirements gathering. The questionnaire consists of 12-item questions in which the primary objective was to gather the necessary information from senior citizens in addressing concerns regarding the study. The researchers implemented the dichotomous scale to answer the questionnaire in the simplest feasible manner and with the least amount of work, considering dichotomous questions only offer two possible answers to every question in the format of Yes or No.

The researchers conducted an interview with the personnel of the Center for the elderly and asked a series of questions for data and requirements gathering for developing the eAlaga. The interview was held in the center in a semi-structured interview, which is ideal for giving interviewers the right to explore a predetermined list of questions.

3.4 Data Gathering Procedure

The researcher constructed a questionnaire checklist with clear and not misleading language for gathering the data and information about the center and its clients. The questionnaires are composed of dichotomous questions which provide research participants with an option from which they choose a response, thus, the results can easily be compared and statistically analyzed.

Thirty (30) copies of questionnaires will be successfully completed and returned. After the respondents answered the survey questionnaire, the researcher collected and tallied the data for interpretation. The statistician would then determine appropriate statistical tools to be used and interpret the data. Moreover, the corresponding answers to the question are kept in accordance with the agreement of the respondents and the researchers.

Furthermore, the researchers made a letter for approval to conduct an interview at the Center for the Elderly. The researcher, after establishing the validity and reliability on how to gather the requirements in developing the application formulated a set of interview questions for the personnel of the center for the elderly. During the interview, recording the process by means of camera and voice record application would be dependent upon on the approval of the center.

3.5 Locale of the Study

The study was conducted at the Center for the Elderly. It is located at Ipil-Ipil Street North Signal Village, Taguig City, Metro Manila Philippines. The researchers selected the place because the researchers found out that the center still uses a traditional process of offering, inquiring, queuing, and acquiring the center's services.

Figure 3-1. Center for the Elderly in Google Map via Satellite

Figure 3-1 shows the map location of the Center for the Elderly in Taguig City. Center for the Elderly is a government-owned wellness hub for senior citizens located at 13, 1639 Ipil-Ipil Street, North Signal Village, Taguig City, Metro Manila.

3.6 Statistical Treatment of Data

Our research aimed to conduct a questionnaire to the selected senior citizens at four chosen barangay in Taguig City such as Central Signal with an estimated total of 4123 senior citizens, North Signal with an estimated total of 3356 senior citizens, South Signal with an estimated total of 3864 senior citizens, and Western Bicutan with an estimated total of 6970 senior citizens. The total estimated population of the said four barangay is 18,313 as of May 2, 2022

To interpret the data effectively, the researchers will use the following statistical treatment. The Slovin, Percentage, and Weighted Mean are the tools that will use to analyze the data.

1. To determine the sample size, the researcher considered the Slovin formula in computing the sample size, as shown below:

Slovin:

$$n = \frac{N}{1 + Ne^2}$$

Where:

n = sample size

N = total population$e$ = margin of error

2. To determine the proportion of each given data, the researcher considered the Percentage formula in computing the proportion of each given data, as shown below:

Percentage:

$$P = \frac{f}{n} \times 100$$

Where:

f = frequency

n = sample size

P = percentage

3. To determine the arithmetic average of each given data, the researcher considered the Weighted Mean formula in computing average of each given data, as shown below:

Mean:

$$\mu = \frac{\sum x}{n}$$

Where:

μ = computed mean

$\sum x$= sum of all answers

n = sample size