BAYMAX – YOUR PERSONAL HEALTHCARE COMPANION

A Project Proposal

Presented to the Faculty of

Information Technology Department

School of Accountancy, Management, Computing, and Information Studies

Saint Louis University

Baguio City

In partial Fulfillment of the Requirement for

Introduction to Computing (LEC and LAB)

Submitted by:

AGUILAR, Jemari Q.

FERRER, Vivi Celinne V.

HUFULAR, Jekka Menna S.

LACORTE, Abby Gaile V.

MADISON, Jhoie Amber

MONTILLA, Jhunisa Mae B.

PAYANAY, Kresha Mae M.

RAMAT, Nelle Angela

December 2021

Table of Contents

List of Figures

INTRODUCTION

A Healthcare System is a nation's backbone. It primarily refers to the institution, group of people, and structure that focuses on providing healthcare fundamentals. The outburst of the COVID-19 pandemic made a huge impact on the healthcare facilities and services in the Philippines. The fusion of supply shortage in hospital facilities and increased virus cases gave rise to the number of people frightened to go to hospital facilities face-to-face and get checked-up. It was reported that health services have been somewhat or totally disturbed in numerous countries with the greater part (53%) of the countries surveyed have partially or totally disturbed services for hypertension treatment; 49% for treatment for diabetes and diabetes-related complications; 42% for cancer treatment, and 31% for cardiovascular emergencies (WHO Geneva, 2020). Furthermore, a study by Chen, Katherine L, Brozen, Madeline, Rollman, Jeffrey E., et al. (2020) found that nearly 6 million Americans delay or forgo health care each year because of transportation difficulties. Over 40% of U.S. adults reported that they had postponed health care due to COVID-19. Decreased use of healthcare can have severe and life-threatening health consequences.

On the other hand, the decrease in economy and income during the pandemic made a significant impact on people's daily budgets. A study by Scarlett T and Christopher M. about the analysis of medical assistance programs found that the classification was essential to determine the indigency of financially challenged patients to support their medical needs. About 63% of the patients were unemployed. Another 23% of the patients were employed, but the income appeared not to support basic medical needs. Most employed patients were drivers, house helpers, farmers, vendors, and business helpers. This further characterized the profile of underprivileged patients who needed financial support to meet their medical needs. These components and background made the researchers intend to investigate and present a solution to alleviate these problems using modern technology. Moreover, in a study conducted by Neeraj Bhandari, Yunfeng Shi, and Kyoungrae Jung published in 2014, it was reported that individuals with financial barriers to healthcare access, difficulty getting timely appointments with doctors, and conflicts in scheduling during clinic hours are more likely to search for general health information online than those without these access barriers. Those unable to get timely appointments with physicians are more likely to participate in health chat groups and email physicians. The internet may offer a low-cost source of health information and could help meet the heightened demand for health-related information among those facing access barriers to care. 42% of the respondents' report searching for health-related information on the internet during the previous 12 months. Those individuals tend to be younger, have college educations, have higher incomes, and report

better health compared to those not having searched for health information online. Only a small proportion of respondents' report using chat groups (3%) and email communications with doctors (4%). The proportion of respondents reporting financial barriers, long wait times for appointments, inability to get through on the phone, and inability to visit the clinic during open hours is significantly higher among general health information searchers than among those who did not search for health information online. However, health information searchers are less likely to report transport problems (1.5%) than non-searchers (3%). respondents using email to communicate with physicians are more likely to report long wait times for an appointment, inabilities to get through on the phone, and inabilities to go during open clinic hours compared to non-users.

Baymax's main purpose is to aid those who are suffering greatly throughout this outbreak. As the virus spreads across the country, many people who are sick are having difficulty finding a hospital to admit them to. For numerous people, data gathering methods will include an analysis of how they now go to the nearest clinic or hospital without making an appointment, as well as how concerned they are about being as close to as many people as feasible.

The findings of this study will demonstrate how this effort will continue to be beneficial and useful long after the pandemic has passed.

The results of this study will be used to demonstrate this contrast and provide insight into the current challenge of promoting environmentally acceptable practices in online appointments and seeking help online. Furthermore, it is intended that this initiative would serve as the start of a larger body of research into the subject.

SIGNIFICANCE OF THE SYSTEM

The COVID-19 pandemic has brought unprecedented and swift changes to all our lives. Threats posed to the health and well-being of everyone in the community.

Due to strict community quarantine measures, protocols, and travel restrictions, people have faced a lot of difficult challenges in getting proper health care, and they are unable to schedule appointments at their local clinics and hospitals face-to-face.

The internet may offer a low-cost solution to these problems. Because with the internet, we cannot fully trust the information because we don't know if that information is even true. That is why with BAYMAX, we don't have to search on the internet for concrete information about COVID-19 in our country, we don't have to wait for a long time for an appointment, and we don't have to go to the local clinic to schedule an appointment.

The importance of BAYMAX is that we can do all those things with ease:

- BAYMAX can check the user's medical history.
- BAYMAX can set up an appointment with doctors, local clinics, and hospitals.
- BAYMAX can provide concrete updated information and to learn more about covid 19 in our country.
- BAYMAX can offer financial assistance to clients and people who need medical help.
- BAYMAX can request donations from people that are prepared to provide.

This system of BAYMAX will be helpful to everyone because, considering the threat posed by the COVID-19 virus and its variants, it is essential to take care of one's own health.

The BAYMAX system would provide help by providing medical support in scheduling appointments in their local clinics and hospitals. The application would be a beneficial way to give all the medical information one might need when asking for medical assistance, and people could extend their help and ask for help in the application.

Setting appointments is more efficient and easier since the list of available doctors in the area are listed inside the application, making it convenient for users. The

application also includes emergency contact numbers that are essential during difficult situations. It might also save lives since it notifies people when a user's heart rate is high or has an irregular rhythm. Medical records of a patient are listed inside the application, which saves time during medical screening or check-ups since doctors can check the application, if the user allows it, and be informed of the latest data of the patient. It also tracks the user's health status and the symptoms of the patient, making them more aware of the overall health of their body.

Accessing relevant and updated facts about the COVID-19 in the application is included, enabling people to be more informed of the virus that affected the whole world. Information about the COVID-19 is accessed faster since users would not need to search the entire web for specific details. Users would only need to open the app, read from there, and gain knowledge.

This system will impact society and its people to care better for one's health and to be more considerate of all types of illnesses, may it be a non-emergent case or not. It is essential for everyone to monitor and be informed of the status of one's health to make better medical choices. Family members are safer and more confident when informed of the possible symptoms of possible diseases.

The system enables people to be more helpful and practice sympathy or empathy by donating to those in need of financial assistance. The system would also allow people to provide medical assistance easier, in case of an emergency since the medical histories of patients are listed inside the application.

PRODUCT/ SERVICE

A. Design Brief

This application aims to provide medical support, particularly during the pandemic when people are unable to schedule their appointments at their local clinics or hospitals. This project is helpful to everyone because, considering the threat posed by COVID – 19 virus and its variants, it is essential to take care of one's health. This application consists of the patient's details – this includes their emergency contact, medical history, emergency hotlines, politicians or personalities looking for donees, and more relevant information about COVID-19.

A.1. Upon Opening

When the user first launches the app, they will see the logo and the name. We chose a simple design because we didn't want the user to be distracted by unnecessary designs. Furthermore, our target audience includes seniors, therefore, the simpler the better.

Figure 1. Upon Opening of the Application

A.2. Home Page

The user will be taken to the mobile application's home page as they go through the application. This section will cater to the application's most significant component, in which all the application's actions and objectives will be introduced. The home page's interface features a simple yet useful design with helpful text and icons that will serve as a user's guide throughout the application. The user's name, profile photo, the button to check the financial assistance, the button to set up an appointment, and the button to learn more about COVID-19 updates in our country are all included in the content of this section of the application. Furthermore, the user can access their medical profile by clicking on their profile (see figure 3 for the medical profile interface).

Figure 2. Home Page

Financial Assistance

The financial assistance section offers a list of people who require financial support. Financial assistance or donees were added to the app which allows users to request donations from others that are prepared to provide. The donee's avatar, name, age, cause for financial aid, total amount target, goal tracker, and give button are all included in each section. The name and age are used to identify the person. The objective of the financial support allows people to assure that the donation will not be utilized for anything other than medical purposes.

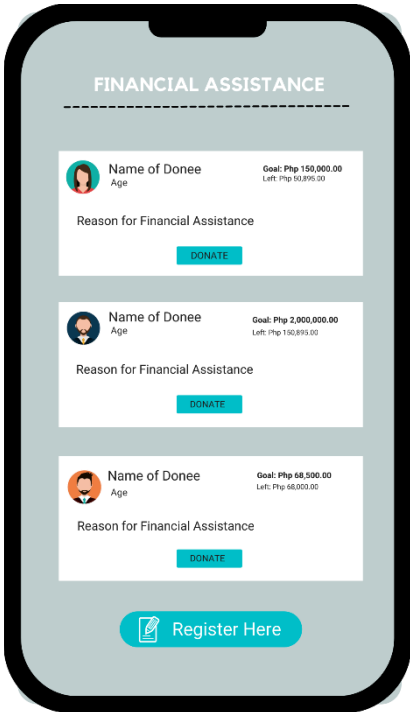


Figure 2.1. Financial Assistance

Financial Assistance Registration Form

This part also allows users to apply or register for financial assistance, which is especially useful for people who are having financial difficulties. The user must fill out the required information, including their name, address, phone number, amount required, and reason for seeking financial assistance. In addition, individuals must show documentation of indigency to prove that they are indeed financially constrained. Users can upload their barangay's certificate of indigency as well as their hospital bill for the administration to verify and confirm their request.

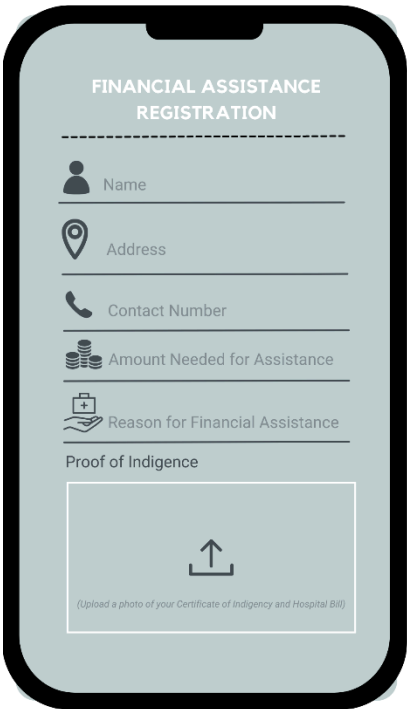


Figure 2.2. Financial Assistance Registration Form

Administration View on Financial Assistance

The administration view on the financial assistance includes a list of donee, and their information, who registered for the financial assistance that needs verification. This section lets the administration review the request and allows them to confirm the financial assistance. Every registration form filled by the potential candidates is assigned in the requests area in the interface. The interface was created with a simple yet helpful design that will definitely serve its purpose. Every request initially includes the name, address, contact number, amount needed, and the proof of indigence of the candidate. There can be lots of registration forms hence, our system will carefully check every form and do extensive reading in their reason of the need for financial assistance. Each of the registration forms of the donees have a view *more* button so that the administrator can check the reason of the candidates. If the admin decides to confirm the candidate, he/she can click the *approve* button.

– Figures are inserted already in the word document –

Donor's View for Giving Donations

Upon clicking the donate button on the financial assistance's page (figure 2.1), the donor will see the cash-in interface, where they can input their donation amount, as well as their mode of payment. As for the amount to be entered by the donor, this must not exceed the amount goal for the donee. Our application ensures that any amount will be

much appreciated because this will help the designated donees a lot. After entering the amount that they want to donate, the donor will choose the mode of payment. The available modes of payment in our system are GCash, BPI Mobile Banking, BDO Mobile Banking, Landbank, Coins.ph, and China Bank.

– Figures are inserted already in the word document –

Donor's View for Confirming Donation

This section allows the donator to be updated of their donation. It includes the donor and donee's account details, and the statement that confirms the fund transfer. This screen is mainly for the purpose of the transaction receipt for the donor. The interface was created through the inspiration of the Mobile Banking transactions. Specifically, on the *Transfer from* part of the interface, this includes the name of the donor, mode of payment, account number of the donor, amount to be transferred, service fee that depends on the bank, and total amount. On the *Transfer to* part of the interface, this includes the name of the donee, bank account, and account number of the donee. The system will ensure that the transferred fund will directly transfer to the bank account of the donee. Aside from this, we also include the confirmation message that the transaction was successfully done in order to notify the donor about their money.

– Figures are inserted already in the word document –

Appointments

The appointment feature allows users to conveniently plan appointments. The options for various check-ups (General Practice, Specialist, Dentist, and Mental Health) and a list of emergency hotlines for users to contact in case of emergency would be the first things they would see.

Figure 2.3. Appointments

Symptoms and Clinical Documents

In this section, users can input their symptom/s, date of occurence, and how frequent they felt it. Additionally, they are required to upload their clinical documents or a valid ID to confirm their identity.

– Figures are inserted already in the word document –

Book Appointment

Once the user has decided on the type of check-up they want, they will be taken to the book appointment section, which will display a calendar, available time, and doctor. Users can schedule their check-up on a specific day, time, and with a specific doctor.

– Figures are inserted already in the word document –

Request for Appointment

This interface is the hospital's administration view. Here they can see the user's information as well as the details of appointment, which is divided into two sections. The first section consists of the symptoms, date of occurence, and the frequency of the symptoms. As for the second, it consists of the date and time of the appointment, as well as the name of the doctor.

– Figures are inserted already in the word document –

Payment Confirmation and Receipt

The appointment feature also consists of another interface for the appointment fee. The interface would allow the user to take a screenshot of confirmation which will be presented at the day of the appointment. Through this process, the app provides profit, alongside app monetization. Lastly, this feature consists of the details of the user as well as the information about the appointment and at the bottom of the screen, the confirm button is seen.

– Figures are inserted already in the word document –

Appointment Notification

Once the appointment is set and confirmed, the user will be notified about its details, as well as their past appointments.

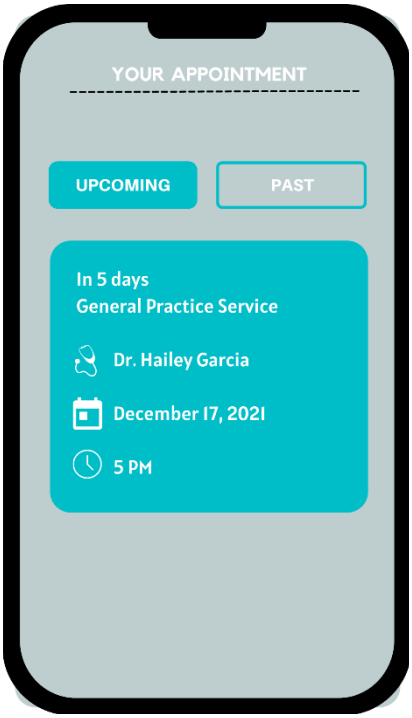


Figure 2.5. Appointment Notification

Recent News

All the information regarding COVID – 19 has been compiled to assist the user in gaining a better understanding of the current events with regards to the virus. It contains all relevant information, such as vaccinations and COVID -19 variations. The design is organized into sections that comprise the information's title, a brief description of the topic, and a read more button. The design's main section contains information on COVID – 19, as well as an overview.

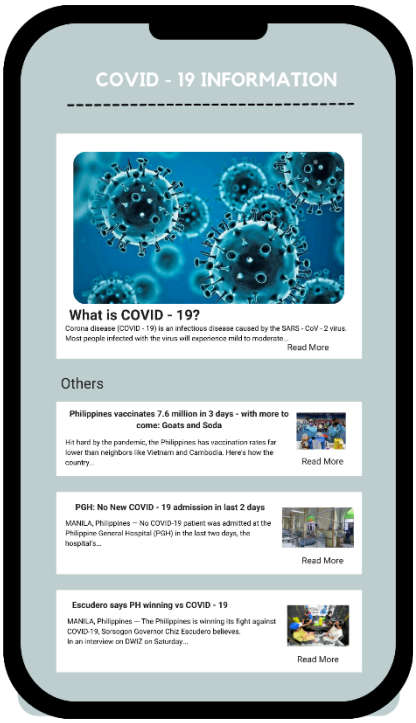


Figure 2.6. Recent News

What is COVID – 19?

This is the main news article in this application; it comes from the WHO (World Health Organization) official website and is divided into three (3) sections: Overview, Prevention, and Symptoms. A full explanation of COVID – 19 is provided in the Overview section. Following that, it explains numerous strategies to protect yourself against the virus in the prevention section. Finally, there is a section on symptoms, which includes a list of symptoms ranging from the most common to the most serious.

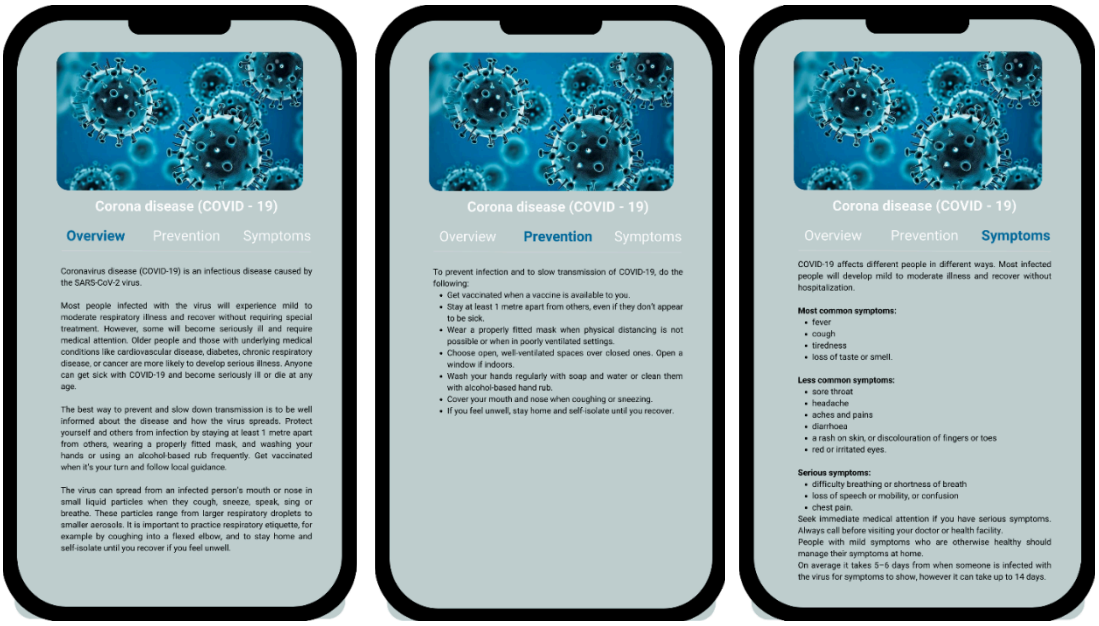
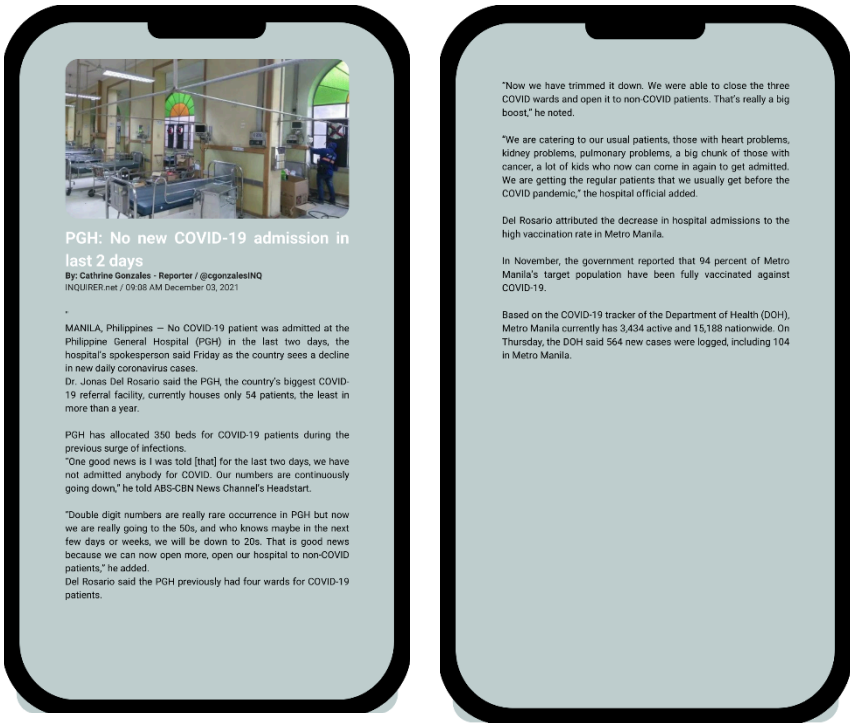


Figure 2.7. What is COVID – 19?

Others (News Articles)

The others section contains new, relevant, and important news about COVID – 19. For the sake of demonstration, we only put three (3) news articles.

Figure 2.8. Others (News Article 1)



PGH: No new COVID-19 admission in last 2 days

By: Cathrine Gonzales - Reporter / @cgonzalesINQ
INQUIRER.net / 09:08 AM December 03, 2021

MANILA, Philippines — No COVID-19 patient was admitted at the Philippine General Hospital (PGH) in the last two days, the hospital's spokesperson said Friday as the country sees a decline in new daily coronavirus cases.
Dr. Jonas Del Rosario said the PGH, the country's biggest COVID-19 referral facility, currently houses only 54 patients, the least in more than a year.

PGH has allocated 350 beds for COVID-19 patients during the previous surge of infections.
"One good news is I was told [that] for the last two days, we have not admitted anybody for COVID. Our numbers are continuously going down," he told ABS-CBN News Channel's Headstart.

"Double digit numbers are really rare occurrence in PGH but now we are really going to the 50s, and who knows maybe in the next few days or weeks, we will be down to 20s. That is good news because we can now open more, open our hospital to non-COVID patients," he added.
Del Rosario said the PGH previously had four wards for COVID-19 patients.

"Now we have trimmed it down. We were able to close the three COVID wards and open it to non-COVID patients. That's really a big boost," he noted.

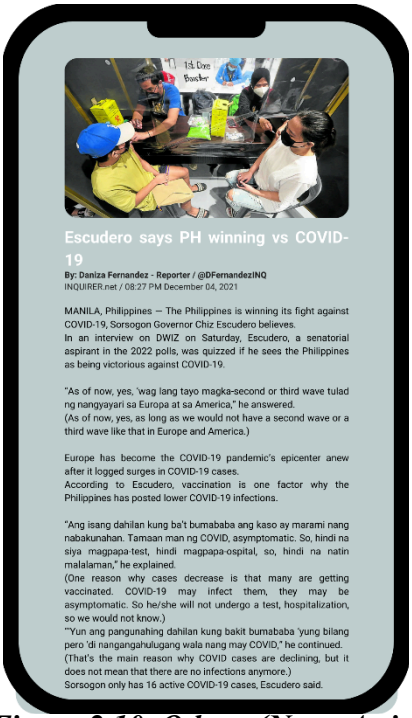
"We are catering to our usual patients, those with heart problems, kidney problems, pulmonary problems, a big chunk of those with cancer, a lot of kids who now can come in again to get admitted. We are getting the regular patients that we usually get before the COVID pandemic," the hospital official added.

Del Rosario attributed the decrease in hospital admissions to the high vaccination rate in Metro Manila.

In November, the government reported that 94 percent of Metro Manila's target population have been fully vaccinated against COVID-19.

Based on the COVID-19 tracker of the Department of Health (DOH), Metro Manila currently has 3,434 active and 15,188 nationwide. On Thursday, the DOH said 564 new cases were logged, including 104 in Metro Manila.

Figure 2.9. Others (News Article 2)



Escudero says PH winning vs COVID-19

By: Daniza Fernandez - Reporter / @DFernandezINQ
INQUIRER.net / 08:27 PM December 04, 2021

MANILA, Philippines — The Philippines is winning its fight against COVID-19, Sorsogon Governor Chiz Escudero believes.
In an interview on DWIZ on Saturday, Escudero, a senatorial aspirant in the 2022 polls, was quizzed if he sees the Philippines as being victorious against COVID-19.

"As of now, yes, 'wag lang tayo magka-second or third wave tulad ng nangyayari sa Europa at sa America," he answered.
(As of now, yes, as long as we would not have a second wave or a third wave like that in Europe and America.)

Europe has become the COVID-19 pandemic's epicenter anew after it logged surges in COVID-19 cases.
According to Escudero, vaccination is one factor why the Philippines has posted lower COVID-19 infections.

"Ang isang dahilan kung ba't bumababa ang kaso ay marami nang nabakunahan. Tamaan man ng COVID, asymptomatic. So, hindi na siya magpapa-test, hindi magpapa-ospital, so, hindi na natin malalaman," he explained.
(One reason why cases decrease is that many are getting vaccinated. COVID-19 may infect them, they may be asymptomatic. So he/she will not undergo a test, hospitalization, so we would not know.)
"Yun ang pangunahing dahilan kung bakit bumababa 'yung bilang pero 'di nangangahulugang wala nang may COVID," he continued.
(That's the main reason why COVID cases are declining, but it does not mean that there are no infections anymore.)
Sorsogon only has 16 active COVID-19 cases, Escudero said.

Figure 2.10. Others (News Article 3)

A.3. Medical Profile

The medical profile section of this app includes the user's name, birthday, and age, as well as confirmation of whether or not they are an organ donor, weight, height, blood type, and whether or not they have allergies.

– Figures are inserted already in the word document –

B. Design Architecture

This section of the paper discusses the design architecture of the application, BAYMAX, in a detailed manner by using diagram to present and explain the function of each component and the interrelationships among the components.

The three-layer architecture is the most popular style of architecture. It is required for the design and development of a mobile application. It refers to the application's internal architecture. The display layer, the business layer, and the data access layer are the three layers that make up this architecture.

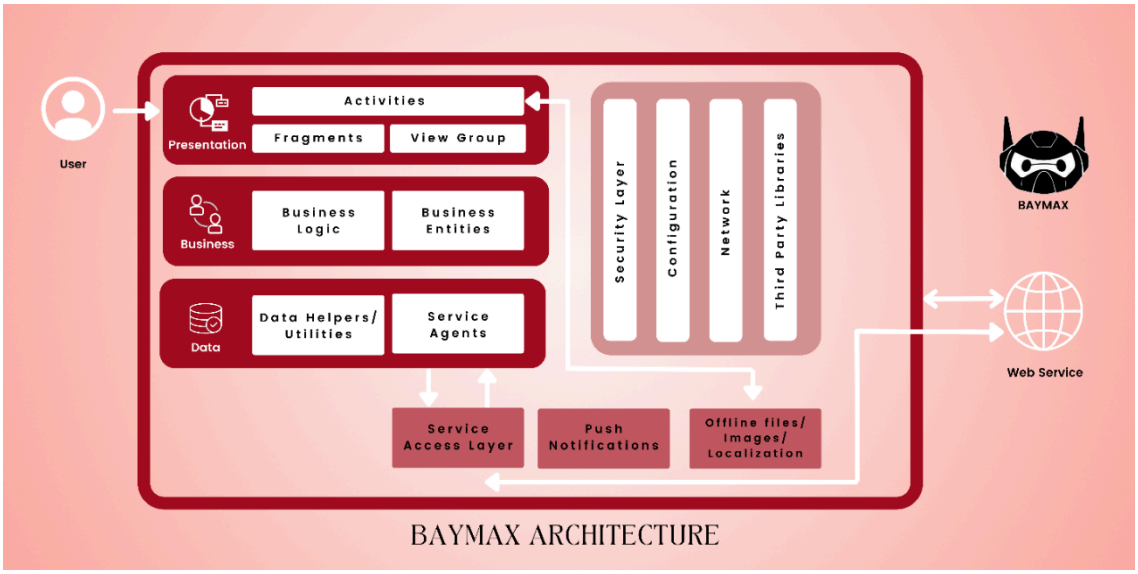


Figure 4. Baymax's Design Architecture

PRESENTATION LAYER

In Android, there are a variety of UI components. There are three (3) parts to it: activities, fragments, and the view group. The screen with a user interface is referred to as the activities. The activities refer to the screen with a user interface. In our application, BAYMAX, the activities here refer to the Upon Opening (Logo and Name of the Application), Home Page (Financial Assistance, Appointments, and Recent News), and

About the User (Personal Information, Body Measurement, Heart, Symptoms, Respiratory, and Clinical Documents).

Fragments, on the other hand, are designable components that can be placed on an activity or screen. Our application used fragments as a component to make it easier for the user to access the system's functions. The fragment of our application, according to our Design Brief, is a single-page layout.

All the actions are gathered in the view group. This also refers to the design layout that was used during the development. To ensure that the required components are present in every section of our application, we used a combination of linear and relative architecture.

Furthermore, our application utilizes the user's smartphone as an input and output device, as users enter data by touching the screen, the outcome is displayed as graphics on the screen. When a user submits their personal information (name, address, phone number, and emergency phone number) in the about the user section, for example, it displays their personal information that matches the requirements.

BUSINESS LAYER

This layer acts as a channel for data between the presentation and data access layers. All the business logic or functionality is carried out here. To function correctly, this layer relies on connections such as the internet and web services. The ability to use the internet and web services within the program facilitates the flow of work and data. This refers to the integration that we will have with the various hospitals as well as the people who are willing to donate to the people who need Financial Assistance. This layer mostly contains objects or command patterns that should be considered when implementing functions that are required by a distinct set of commands in the business logic.

DATA ACCESS LAYER

The data access layer's objective is to meet the needs of the applications. They oversee ensuring the efficiency and security of data transit. The data access layer will help get data from your service access layer and push it back to the offline database, allowing users to access the data even when it is offline.

Internal data storage allows mobile applications to keep track of how users set and provide data. Because our software is available on both the iPhone and Android, it utilizes the SQLite Database to store our users' data. Web services are also used in this

layer because they are responsible for the application's service exchange. This section contains Clinical Documents, Financial Assistance Registration Forms, and Upcoming and Recent Appointments that must be filled out by the user. These documents are solely based on information provided by the user.

OTHER COMPONENTS

WEB SERVICES

Web Services are essential in mobile applications because they serve as a mediator between the back-end database and the mobile application, which is continually growing. Web Services can be very useful in our application in terms of exchanging protocols, requirements, and communication across different services in our system. Most of the components in the application are connected reliably, particularly the web services, which are responsible for data interchange between the components. In our application, the Web Services contain the process of the user creating appointments, donations from individuals or organizations, financial aid requirements, and clinical document sharing.

SERVICE ACCESS LAYER

This component interacts with the web services and collects all data. At the same time, it gathers information needed to return to the database. This layer utilizes connectivity as well as data storage (SQLite Database), both of which are required for the interchange and gathering of data in this application. The Service Access Layer is essential to the boundary and set of available actions that our application provides for the user, in line with the application that we have created. Appointments, Financial Assistance, COVID-19 News, and Clinical Actions have all been successfully implemented.

LOCALIZATION LAYER

It is in charge of keeping all of the necessary files and information. Because of this, the files and images will also be accessible offline. Data supplied by the user in the about user section of our program may still be accessed even if the user is offline, allowing for easy tracking and monitoring. This layer makes use of data storage (SQLite Database) to store the user's data and make it available for usage even when the user is offline.

PUSH NOTIFICATIONS

Push notifications are the most convenient component of the design for notifying the user about an upcoming appointment for healthcare services. Specifically, since this allows the user to receive a notification, such as SMS text messages or mobile alerts, informing them that a specific appointment has been confirmed. The output of this application is the notification that the user receives, which is shown as a graphic on their smartphone. This component focuses on the Appointment Interface functionality in our application. The appointment that has been created will generate a push notice to inform the user about the service through the user.

SECURITY LAYER

This layer is crucially significant for both the application's and the user's security. The security layer provides a variety of options for protecting and preventing malicious assaults on the online application. Given that various types of data are exchanged every second, such as authentication credentials, user session data, personal data (PII), transactional data, and banking data, it is essential to have a layer that filters access control and ensures that this access does not pose a threat to the user's data. This layer is primarily required in our application for we must ensure that the data of users, such as clinical documents, appointments, registration forms, and money for financial assistance, is secure and protected from any threat. This layer protects users from data theft and network instability, and to do so, web services utilize VPN to encrypt Internet connections while also giving a high level of anonymity. Furthermore, application security controls, such as an application firewall that rigorously limits what actions are allowed and banned, are often integrated into the software. This includes things like a security routine for applications that includes protocols and regular testing.

CONFIGURATION

This component is intended to fix a set of preconfigured elements that explain the connections, bindings, interface, ways, and assembly required to build the finished application. In relation to the IT Administration of the hospitals that we will be working with, we intend to create configuration or also known as *application restrictions*. To get more into the connectivity of the configuration, its process flow in our application starts in the mobile devices of the users wherein the parameters will be installed in the drivers of the device. Also, the application has a connection cellular data and Wi-fi to configure the sync content of the data in the application.

This allows our application to have its own identity in terms of design or interface, where we have developed predefined rules such as the financial support

requirements, appointment availability, and personal information needed to store data for clinical documentation.

NETWORK

This primarily explains the purpose of communications networks, which covers the network's layout and framework, as well as accepted equipment, services, functions, and principles. Aside from that, the network outlines how the system interacts with other networks. To interact with the other components in the application, networks rely on connections. Interactions such as confirmation of the user's appointment, availability of services in a specific hospital, documentation of the user's medical results, and relevant pandemic updates.

THIRD PARTY LIBRARIES

In general, this allows the application's developers to integrate third-party software that will improve the system's functionality, development, and cost. This includes the file and image downloading capability in our program for our Financial Assistance Registration Form and Clinical Forms such as clinical examination results, which are dependent on the data storage (SQLite Database) of the application to access the data of the user.

BUSINESS MODEL

The planned operations for the business model, which is aimed to exhibit the result of a profit in a marketplace, are discussed in this section. It depicts the business plan that will be implemented in a competitive environment.

BAYMAX

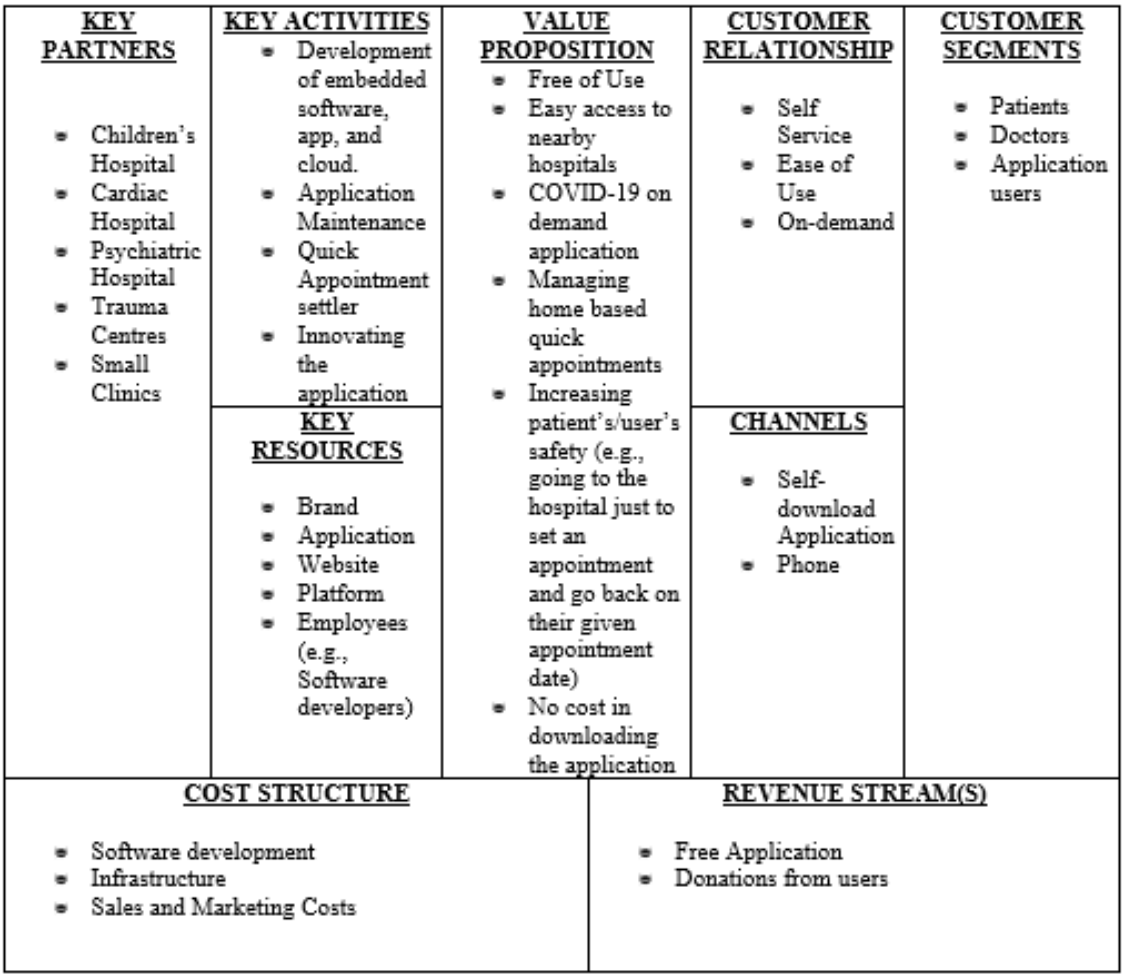


Figure 5. Business Model

Key Partners

We primarily focused on forming alliances with hospitals. Our platform's emphasis elements are medical support; hence the offered important partners were chosen. The company decided to broaden the range of hospitals available, therefore we distributed different sorts of hospitals with various types of professions.

Key Activities

The activities outlined by the group are aimed to offer partners or investors a preview of what the developers or the group have planned.

Key Resources

The resources were chosen based on the application's specifications. These are the most significant assets that the proposed application requires to function.

Value Proposition

We summed up the categories under which the proposed application fits in terms of value proposition. The group wants new users to have no issues about using the software. The key objective of these categories is to allow customers to make an appointment with a nearby or preferred hospital promptly and safely. The application is also completely free to use; no money is necessary to utilize it.

Customer Relationship

It's quite self-explanatory in terms of customer engagement. In light of the current pandemic, the organization wishes to inform potential users that the proposed application is self-service, simple to use, and available on demand.

Channels

These provided platforms or channels indicate how the group or firm can reach out to its potential customers.

Customer Segments

These are the various people, groups, or organizations that the business or organization aims to reach and serve.

Cost Structure

These are the expenditures and expenses that the company will experience because of the proposed application. Because the projected application is primarily focused on its customers' mobile usage, software development is critical to the ongoing operation of the app. Whether the employees require a comfortable and functional working area in a building or any form of studio, the infrastructure is provided. The company needed to place the application in the marketplaces, therefore sales and marketing charges were added to the cost structure (e.g., Play store, App store, Microsoft store, etc...).

Revenue Stream(s)

The software is free and allows users to make appointments, read the news, and organize a charity drive for individuals in need. Donations from users will be the company's source of revenue.

Monetization

Baymax is a free mobile application design that can check the user's medical history, can set up an appointment with doctors, local clinics, and hospitals, can provide concrete

updated information and to learn more about COVID-19 in our country, can offer financial assistance to clients and people who need medical help, and lastly, it can request donations from people that are prepared to provide.

But if it is a free mobile application, how can we, the administrators, profit from our mobile application?

App monetization is essentially any way in which an app is used to make money. With app monetization, we have a chance to leverage the user's base in such a way that we can earn money – it's as simple as that.

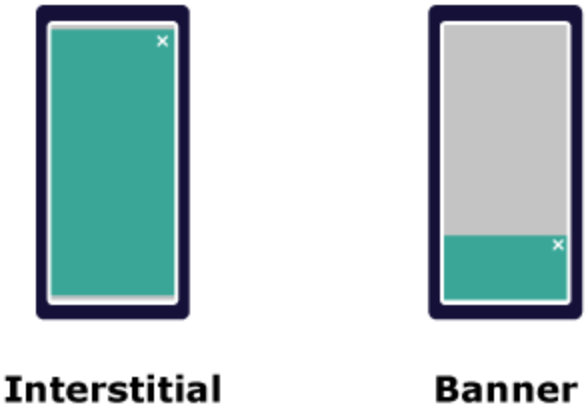
How can we Monetize our App? :

- **In-App Purchases**, In-app purchases are the number one source of revenue within the app industry. In fact, in-app purchases make up about 47 percent of the total revenue generated from apps worldwide.

  In our mobile application, we added another interface for the payment where it will include payment for the consultation fee and payment for the administrators.

- **Advertisement Revenue for monetizing an app**, The number one source of revenue for app developers comes from in-app ad revenue. The vast majority of free apps depend on this source of revenue to remain afloat in the marketplace. CPM (Cost Per Thousand) is preferred amongst free app developers because it doesn't require the user to click on the advertisement in order for the developers to earn. The pay is less, but it's less intrusive on the user experience.

Our free mobile app can be monetized and sell off revenue by having an advertising



strategy. By advertising via banner and interstitial advertisements.

A.) **Banner Advertisements**, These ads are placed at the top or bottom of the mobile device screen. In general, these are less intrusive, as users are still able to use the mobile app normally. On the other hand, banners have lower engagement rates (CTR-click-through rate), and these ads are dependant on brand recognition.

B.) **Interstitial Advertisements**, These ads are full-screen pop-ups shown at a specific moment within an app. These are typically displayed when the app is opened or closed. The user has two taps to choose from - either close the ad or check out the promoted content.

REFERENCES:

- https://mlsdev.com/blog/how-do-free-apps-make-money
- https://www.leanplum.com/blog/free-app-monetization-methods/

REFERENCES

Afilalo J, Alexander KP, Mack MJ, et al. (2014). Frailty assessment in the cardiovascular care of older adults.

Appfutura. (2017) Understanding Mobile App Architecture. Appfutura. Retrieved from https://www.appfutura.com/blog/understanding-mobile-app-architecture/

Arriaga, P., Esteves, F., Pavlova, M., & Picarra, N. (2021). Coronavirus Disease (COVID-19): The Impact and Role of Mass Media During the Pandemic. *Frontiers in Psychology.* 1-3. Front. Psycholo. 12:729238. Doi: 10.33389/fpsyg.2021. 729238

Bayani, D.S. & Tan, S.G. (2021). Health Systems Impact of COVID-19 in the Philippines. Retrieved on November 26, 2021, from https://www.cgdev.org/publication/health-systems-impact-covid-19-philippines

Bhandari, N., Shi, Y., & Jung, K. (2014). Seeking health information online: does limited healthcare access matter? *J Am Med Inform Assoc, 21*, 1113-1117. doi:10.1136/amiajnl-2013-002350

Burn-Murdoch J, Romei V, Giles C. (2020). Global coronavirus death toll could be 60% higher than reported. The Financial Times, 6-8.

Chen, K., Brozen, M., Rollman, J., Ward, T., Norris K., Gregory, K. & Zimmerman, F. (2020) Transportation Access to Health Care During the COVID-19 Pandemic: Trends and Implications for Significant Patient Populations and Health Care Needs. *Institute of Transportation Studies,* 1-69. Retrieved from https://escholarship.org/uc/item/22b3b1rc

Cloudfare. (2021) What is a VPN? Cloudfare. Retrieved from https://www.cloudflare.com/learning/access-management/what-is-a-vpn/

Cloudy Academy – All in One (2020). iOs and Android Application Architecture. Retrieved from https://www.youtube.com/watch?v=H3Ekg-fkmf0

Collado, Z. C. (2019). Challenges in public health facilities and services: evidence from a geographical isolated and disadvantaged arae in the Philippines. *Journal of Global Health Reports, 3*, 1-5. doi:10.29392/joghr.3.e2019059

Colson P, Rolain J-M, Lagier J-C, et al. (2020). Chloroquine and hydroxychloroquine as available weapons to fight COVID-19. https://doi.org/10.1111/j.1532-5415.2012.04054.x.

Dickens BL, Koo JR, Lim JT, Park M, Quaye S, Sun H, et al. (2020). Modelling lockdown and exit strategies for COVID-19 in Singapore. Lancet Reg Heal - West Pacific. https://www.thelancet.com/journals/lanwpc/article/PIIS2666-6065(20)30004-3/fulltext.

Edillo, S., Garrote, P., Domingo, L., Malapit, A., & Fabito, B. (2017). *A mobile based emergency reporting application for the Philippine National Police Emergency Hotline 911: A case for the development of i911*. Manila, Philippines. doi:10.23919/ICMU.2017.8330110

Elston JWT, Cartwright C, Ndumbi P, Wright J. (2017). The health impact of the 2014–15 Ebola outbreak. https://linkinghub.elsevier.com/retrieve/pii/S0033350616303225.

Fetzer, T., & Graeber, T. (2021). Measuring the scientific effectiveness of contact tracing: Evidence from a natural experiment. *Proceedings of the National Academy of Sciences, 118(33)*. doi:10.1073/pnas.2100814118

Fontanarosa P., & Bauchner H. (2020) COVID-19—Looking Beyond Tomorrow for Health Care and Society. *Covid-19: beyond tomorrow.* 1-2. Retrieved from https://jamanetwork.com/journals/jama/fullarticle/2764952

Gao, J., Liu, N., Lawley, M., & Hu, X. (2017). An interpretable classification framework for information extraction from online healthcare forums. *Journal of Healthcare Engineering*, 1-12. doi:10.1155/2017/2460174

Gheni, A., Yousif, H., & Jusoh, Y. (2021). Online medical consultation: covid-19 system using software object-oriented approach. *Bulletin of Electrical Engineeting & Informatics, 10(6)*, 3471-3480. doi:10.11591/eei.v10i6.3189

Hossain A, Nasrullah SM, Tasnim Z, Hasan MK, Hasan MM. (2021). Seroprevalence of SARS-CoV-2 IgG antibodies among health care workers prior to vaccine administration in Europe, the USA and East Asia. A systematic review and meta-analysis., 4 - 12.

Inquirer (2021) Escudero says PH winning vs COVID-19. Inquirer.Net. Retrieved from https://newsinfo.inquirer.net/1523739/escudero-says-ph-winning-vs-covid-19?fbclid=IwAR3f6ASJokCQ2ZZRMIQ-6F5k0tJI4yJhzC-BjVOKH_CEWPYHNQdpQ0zmu2Y

Inquirer (2021). PGH: No new COVID-19 admission in lats 2 days. Inquirer.Net. Retrieved from https://newsinfo.inquirer.net/1523271/pgh-no-new-covid-admission-in-last-2-days?fbclid=IwAR0lrHssLW8OyXLqOlNGG65Bcx75_iSPdDqzYDDKN5alq6utVO4jd5Xwv0E

King Edward VI Foundation Birmingham. (2021) Computing Theory. King Edward VI Foundation. Retrieved from https://www.schoolsofkingedwardvi.co.uk/ks2-computing-computer-programming-1-decomposition/

Lynch, M. L., & Pusey-Murray, A. (2021). The effects of covid-19 in the healthcare System. *Public Health Research, 11(1)*, 15-18. doi:10.5923/j.phr.20211101.02

Merkur, S., Maresso, A., Cylus, J. Ginnaken, E. & Lessof, S. (2020) Lessons From The First Wave: The COVID-19 Health System Response Monitor (HSPM) An Evidence Resource and A Source of Analysis. *Perspectives on COVID-19.* 1 112. Retrieved from https://apps.who.int/iris/handle/10665/336282

Metzl, K., Maybank A. & Maio, F. (2020) Responding to the COVID-19 Pandemic. The Need for a Structurally Competent Health Care System. *Covid-19: beyond tomorrow.* 1-2. Retrieved from https://jamanetwork.com/journals/jama/fullarticle/2767027

Mirzaeian, R., Mobasheri, M., & Khaledifar, B. (2013). A comparative study on the benefits and challenges of the application of mobile technology in health. *Life Science Journal, 10(4)*, 3625-3628. Retrieved from http://www.lifesciencesite.com/

NPR (2021). The Philippines vaccinated 7.6 million people in 3 days. Duterte demands even more. NPR ORG. Retrieved from https://www.npr.org/sections/goatsandsoda/2021/12/03/1061075517/the-philippines-vaccinated-7-6-million-people-in-3-days-duterte-demands-even-mor?fbclid=IwAR0xeTD8JQZT0IDxZYIERtt73QgCi3poQ7Oi6a-wQFoElvOukJPNi_C5BWM

Okereke, M., Ukor, N., Adebisi, Y., Ogunkola, I., Iyagbaye, E., Owhor, G. & Prisno D. (2020) Impact of COVID‐19 on access to healthcare in low‐ and middle income countries: Current evidence and future recommendations. *Int J Health Plann Mgmt.* 1-5. Retrieved from https://onlinelibrary.wiley.com/journal/10991751

O.S System (2020) Mobile App Architecture – How to Design it? O.S System. Retrieved form https://os-system.com/blog/mobile-app-architecture-how-to-design-it/?fbclid=IwAR2eKGG5Iigu4IPUl-t9P2GSHKqrbT_ya33APYyLkvsHJi627IcFbWRKW28

Simko, L., Calo, R., Roesner, F., & Kono, T. (2020). COVID-19 contact tracing and privacy: studying opinion and preferences. *Security and Privacy Research Lab*, 1-32. Retrieved from https://seclab.cs.washington.edu/research/covid19/

Soederberg Miller, L., Gee, P. & Katz R. (2021) The Importance of Understanding COVID-19: The Role of Knowledge in Promoting Adherence to Protective Behaviors. Front. Public Health 9:581497. *Frontiers in Public Health.* 1-8. doi: 10.3389/fpubh.2021.581497

Stam H, Stucki G, Bickenbach. (2020). Covid-19 and Post Intensive Care Syndrome: A Call for Action. https://pubmed.ncbi.nlm.nih.gov/32286675/.

Study.com (2019) Application Data Storage for Windows, Android & iOS Mobile Phones. Study.com. Retrieved from https://study.com/academy/lesson/application-data-storage-for-windows-android-ios-mobile-phones.html

T., H. (2008). Internet health information in the patient–provider dialogue. Cyber psychological Behavior, 5:587-589.

Tang, X. & Yang C. (2021) Identifing Influential Users in an Online Healthcare Social Network. *Healthcare Forum.* 1-6. Retrieved from https://ieeexplore.ieee.org/document/5484779

Vaadata. (2021) Mobile Application Security Explained Simple – Episode #3. Vaadata Le Blog. Retrieved from https://www.vaadata.com/blog/mobile-application-security-explained-simply-episode-3/

Wang C, Tee M, Roy AE, Fardin MA, Srichokchatchawan W, Habib HA, et al. (2021) The impact of COVID-19 pandemic on physical and mental health of Asians: A study of seven middle- income countries in Asia. PLoS ONE 16(2): e0246824. Retrieved from https://doi.org/10.1371/journal.pone.0246824

WHO (2021) Coronavirus disease (COVID-19). World Health Organization. Retrieved from https://www.who.int/health-topics/coronavirus?fbclid=IwAR1wZv2FnkeyFbQSisj3lFgsEq0Z8EWMU94akEFd2uS14Seb0IfD37597RM#tab=tab_3

Zhou F, Yu T, Du R, Fan G, Liu Y, Liu Z, et al. (2020). Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China. https://linkinghub.elsevier.com/retrieve/pii/S0140673620305663.