[1] Jennyvi G. Pascua*

[2] Thelma D. Palaoag

Innovating Healthcare Services Through Technology: Building Framework of IDoc Mobile Application

Journal of Electrical Systems

Abstract: Technology has become a vital impact on the development of healthcare systems, particularly through the use of mobile applications to monitor people's health as they become more concerned with maintaining their physical fitness and health. Access to healthcare services is one of the issues in the province of Quirino since hospitals and clinics are limited, communities from rural areas are having problems in availing healthcare consultation. There is a scarcity of mobilization of the people from rural areas who wants and needs to avail healthcare consultation. The goal of this study to design a framework for a mobile health application that is based on community needs, challenges and issues in availing healthcare services in the province. The framework for mobile application is a channel for this problem as it provides a way to contact Doctors in order to address healthcare needs anytime and anywhere. The researchers used Design Thinking as an innovative approach and conducted series of interviews to empathize with the community. The proposed framework for mobile application can help address the needs of the community in availing healthcare services especially those in rural areas. This can improve the quality of health and to address critical needs of patients. This can be a tool to help both patients and medical practitioners in the province of Quirino and nearby provinces in availing healthcare services.

Keywords: Mobile Application, Healthcare Services, Rural Area

I. INTRODUCTION

Adoption of ICT in healthcare particularly the use of mobile technology-based health care services and improved access and affordability of healthcare benefits is deemed necessary [1]. The demand for enhanced communication and informational resources at the point of care area is the main factor driving the broad adoption of mobile devices for better access and information resources [2].

It has been an experienced during the pandemic time that delivery of healthcare provisions to patients was indeed a big problem due to the very limited clinics and hospitals and unavailability of medical facilities in the area. Mobilization was also a problem due to government-imposed lockdowns and other restrictions.

The noble idea of healthcare system of Southeast Asia (SEA) struggles to meet the everchanging demands of its aging population and insufficient healthcare workforce and facilities [3]. Moreso, Telehealth has the potential to bridge healthcare inequity and increased vulnerability to disadvantage communities. Telehealth past studies in the Philippines was limited only during the time of COVID pandemic which was only implemented in National Capital Region[4].

Available medical facilities in the province of Quirino cannot provide the level of treatment required by the communities. With these considerations, it necessitates the development of the researcher of a low-cost, uncomplicated solutions that may be applied anywhere, anytime, and even at home to cater the needs of the populace. The growing trend in mobile applications is another factor driving attempts to maximize healthcare services for mobile applications which is a user-friendly relationship between patients and physicians[5].

A framework that will provide information to monitor patient health status, record consumers health related data, personal data, medical/health indicator, trace symptoms, book doctor appointments and healthcare consultation status will be an answer to the problem of the province in catering medical issues during times of pandemic. It is also a time of innovation for healthcare services to meet the needs of Quirinians and to nearby provinces as well.

These health care service applications make smart mobile phones as useful tools in the practice of evidence-based medical information and other clinical communications and references that may be required [6].

[1] Quirino State University, Quirino Philippines. pascuajennyvi@gmail.com

[2] University of the Cordilleras, Baguio City Philippines. tpalaoag@gmail.com

II. STATEMENT OF METHODS

In order to better understand community needs, particularly those related to access to healthcare services, the researcher in this study conducted a series of interviews with residents of several towns and barangays. The researcher was inspired to design framework for mobile application to avail such services even in rural areas. Using a design-thinking process, the desired features or functionalities of the mobile application for health consultation were identified. It is a technique for problem-solving that entails understanding consumer expectations and developing insights to satisfy those needs.

To determine their responsibilities and interactions with the application, users of the aforementioned mobile application from the community of the several municipalities of Quirino Province were interviewed as part of the design thinking stage.

(a) Empathized. The initial process of the design thinking is to emphatized with the community. Through observation from Hospitals and medical clinics, the researcher studies different attitudes in availing healthcare services of the patients.

(b) Define. Also known as Point of View—describes the needs, desires, or issues of the community. The define stage is the point at which the researcher unload and incorporate empathy findings into the needs that communicates the issue the researcher addressing.

(c) Ideate. Based on these findings, the researchers were motivated to create framework for a mobile application for healthcare consultation in order to satisfy the province of Quirino's demand for healthcare services, especially in state of medical emergencies, pandemics and lockdowns. A framework for mobile healthcare services that will offer an advantage to healthcare provider through access to deliver direct support, interact with patients, and monitor engagement and progress[7].

(d) Prototype. Prototyping is getting thoughts and investigation based on what you see at what are in thoughts. A mobile application will be adapted for healthcare services and shall be design to help individual living in remote area that are expected to be affected during the time of pandemic and emergencies. It shall be designed with AI powered chatbots that can help patients communicate with healthcare providers, triage symptoms, and provide personalized health information including comorbidities that will allows physician to gather, evaluate data and diagnose their patient.

III. RESULTS, DISCUSSIONS AN CONCLUSIONS

After series of numerous interviews to patients in hospitals, medical clinics, and in communities far from hospitals, the challenges and issues of patients in availing healthcare services are shown in Figure 1 with the empathy map.
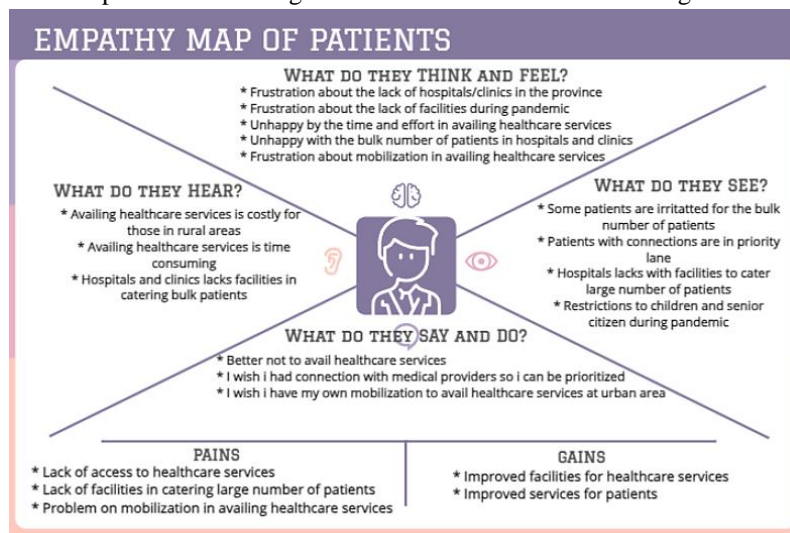

Figure 1: Empathy Map of Patients

Hence, to address these issues of the community a framework for mobile health app or medical services apps that accommodate large number of patients during pandemic, can cater patients from remote areas and can accommodate children, senior citizens and those with comorbidities. Documentation was an easy task and service intimations with the medical practitioner with patients was useful which is related to accessing or using these mobile phone app.

Healthcare apps can radically improve the ease access and speed with which healthcare professionals where they can access, analyse, and respond to clinical data[8].
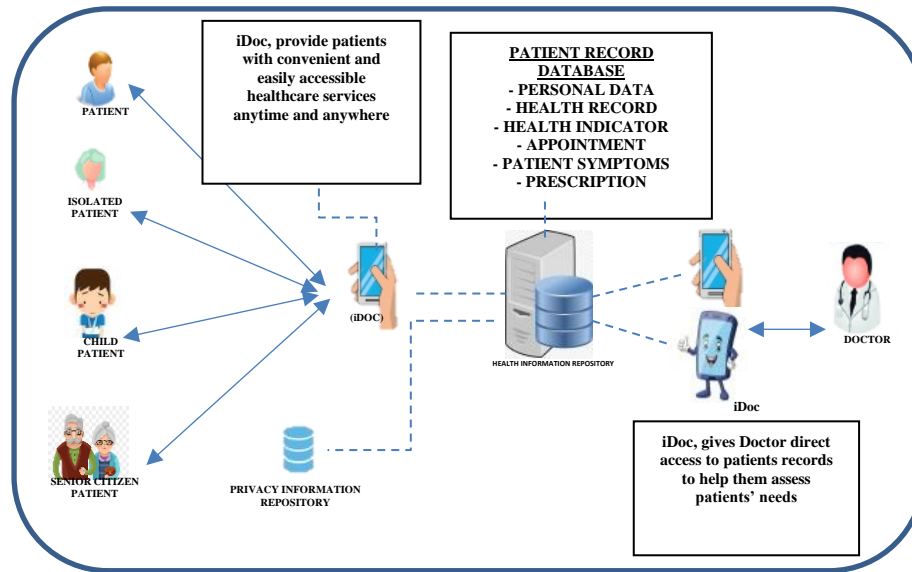
Architectural Framework

Figure 2. Proposed Architectural Framework of iDoc, a Mobile Application for Healthcare services

Figure 2 above shows the architectural framework of the healthcare services which served as a guide for the researcher in conducting the study. The proposed framework has different patient user elements, those isolated patient, children, senior citizen and those with or without comorbidities that is accessible anytime and anywhere. The mobile application has direct control on their personal data that is personally encoded by them which includes patients health records, if with comorbidities like diabetes, hypertension, cancer, asthma, chronic kidney disease, liver disease, and if with heart problem. Health indicator includes patients' weight, height, BMI, blood sugar, blood pressure, and specify if with allergies. If patients have symptoms, the patient should specify if he/she has fever, cough, shortness of breath, sore throat, colds, weakness/fatigue, myalgia, headache, anosmia, anorexia/nausea/vomiting, and diarrhea. It also includes COVID vaccination records of the patient. After data collection, patient can have appointment with available Doctor, inbox for confirmation of appointments by the Doctor available will notify the patient.

Information of patients that is stored in the database to help doctors assess patients for their needs. Doctors using iDoc have direct access to data of patient, and it is protected for privacy. The framework also depicts that doctors have direct connection to patients for healthcare services.

IV. CONCLUSION

The framework helps the researchers think and identify what to improve its services while using the mobile application. The structure of the framework facilitates and guides the users on its used and can be easily assessed by future researchers. The proposed framework eased government issues in accommodating the needs of the community during healthcare services was needed. The framework gives healthcare providers that can track symptoms of patients, may have health record, can have appointments through video consultation with medical doctors, can give medical/health indicators, can give prescriptions and monitor consumer health status and patients may have personal communication with medical providers even without face to face consultation. It highlights the importance of the needs of the community in availing such services that improves the quality of health and to address critical needs of patients and other people who need healthcare services. This provides the researcher an in-depth idea that the said framework for healthcare services application is recommended to meet the needs of the community for healthcare services in the province and is beneficial to all Quirinians and to nearby provinces.

REFERENCES

[1] Ventola CL. Mobile devices and apps for health care professionals: uses and benefits. P T. 2014 May;39(5):356-64. PMID: 24883008; PMCID: PMC4029126.

[2] Pop, L.-M.; Iorga, M.; S, ipos, , L.-R.; Iurcov, R. Gender Differences in Healthy Lifestyle, Body Consciousness, and the Use of Social Networks among Medical Students. Medicina 2021, 57, 648. https:// doi.org/10.3390/medicina57070648

[3] Health and Healthcare Systems in Southeast Asia - United Nations University. (n.d.). Health and Healthcare Systems in Southeast Asia - United Nations University. https://unu.edu/publications/articles/health-and-healthcare-systems-in-southeast-asia.html#info

[4] Monaghesh, E., & Hajizadeh, A. (2020, August 1). The role of telehealth during COVID-19 outbreak: a systematic review based on current evidence. BMC Public Health, 20(1). https://doi.org/10.1186/s12889-020-09301-4

[5] Arini Widhiasia , Rosnah Idrusa *, Muhammad Fermi Pashaa , Mohammad Syukurb, 2013. A Feasibility Study Scheme of an Android-based Integrated Wearable ECG Monitoring System. https://www.researchgate.net/publication/270710380

[6] Thorat, M. N. S., & Kulkarni, D. R. V. (2019, March 20). A Review- Role of Mobile Application for Medical Services. International Journal of Trend in Scientific Research and Development, Special Issue(Special Issue-FIIIIPM2019), 43–45. https://doi.org/10.31142/ijtsrd23060

[7] Eppes, E. V., Augustyn, M., Gross, S. M., Vernon, P., Caulfield, L. E., & Paige, D. M. (2023, February 3). Engagement With and Acceptability of Digital Media Platforms for Use in Improving Health Behaviors Among Vulnerable Families: Systematic Review. Journal of Medical Internet Research, 25, e40934. https://doi.org/10.2196/40934

[8] Marcin, J. P., Rimsza, M. E., Moskowitz, W. B. 2015. The use of telemedicine to address access and physician workforce shortages. Pediatrics, 136(1), 202-209. https://doi.org/10.1177/08971900211033120