**University of Science and Technology of Southern Philippines**

*Cagayan de Oro Campus*

*C.M Recto Avenue, Lapasan, 9000 Cagayan de Oro City*

**A Project Proposal**

**Entitled:**

**MediQue: A Medical Queing Assistance for Clinic and Patients**

**Submitted by the following students:**

Ampusta, Lovely Jane

Fernandez, Judemie

Labanon, Chris John

Lobrido, Aichen

**Submitted to:**

*(Thesis Adviser)*

Mr. Paul Joseph Estrera

*SY: 2019-2020*

**1. Background and Rationale:**

Poor scheduling is “a major source of operational inefficiency and patient dissatisfaction” (Chakraborty, Muthuraman, and Lawley; 2010). The literature on Appointment Scheduling focused on two forms of waiting: waiting within a day and waiting across days. (Gupta and Denton; 2008).

Some hospitals and clinics in the Philippines today still uses the traditional way for appointments. In Cagayan de Oro specifically in Capitol University Medical Center (CUMC) “Woundcare Clinic” medical appointments were done by the schedulers over telephone or in person.

The main problem with traditional medical appointments/scheduling is the availability of appointments slots and the mobile/phone loads. Considering that this is an additional tasks and expenses, in other words it will be time consuming and costly. With (title), less manpower, less human errors (especially in communicating patients and doctors.)

Nowadays, a number of medical appointment/scheduling exist. One of these is the use of MEDtrix. This system is paperless with no patient data management and list, consultation dashboard, discharge diagnosis, doctor's orders, prescriptions, labs, patient details, payment,appointment scheduling, income record, system configurations.

Another one is Queue Plus - Patient Queuing System Plus is a patient queuing system that is designed to make hospital queuing easier and more efficient. It's simple and easy to use. Queue+ can help filter the patients queue by identifying which medical specialist or doctor they wanted to consult to. Queue Plus improves the hospital's handling of queues to better assist the patients and leads better customer satisfaction.

Both the clinic attendant and the patient are sure to be trouble-free when operating the Queue Plus. With Queue Plus System, your hospital will be able to provide better and more efficient services. With Queue+ your hospital is in good hands.

However, the aforementioned medical appointments/scheduling disadvantages, it cannot connect via mobile applications and users should use laptop or PC’s.

On the other hand, the existing systems of this study does not work well for the telecommuters/travelers most especially those doctors that do not have permanent residency.

This application will help staff clinic, doctors and patients’ avoid redundancy, unreadable handwriting and mislook of patients history. It cost long time to work to recheck. With (title) can lessen the work of the staff and can have a fast transaction & notification between patient and clinic.

1. **Statement of the problem**

Hospitals in Cagayan de Oro such as in Capitol University Medical Center (CUMC) specifically in Woundcare Clinic needs to have an accessible way and easy guide for both doctors and patients. As mentioned earlier, in Woundcare clinic they are using a traditional way of setting a schedule. The staff clinic need to print the form, to be filled out and recheck the patients profile. This clinic system is prone to redundancy, unreadable penmanship and mislook of patients history. It cost long time to work to recheck. With (title) can lessen the work of the staff and can have a fast transaction & notification between patient and clinic.

1. **Objective of the Study**

This study aims to design and develop a mobile application and web-based system for CUMC WoundCare Clinic.

Aims may include the following:

1. To design a mobile application and web-based system.
2. To develop the system.
3. To evaluate the usability and functionality of the application and system.

**4. Related Prior Work**

**4.1. Medical Appointment Scheduling System**

Q-nomy’s medical appointment scheduling software is a central server solution for managing appointments across your clinics and reception areas.

The patient scheduling system can handle highly  complex procedures and scenarios such as managing hospital appointments. The patient scheduling system also enables quick implementation by small private clinics; friendly user interfaces allow doctors, staff and patients full access – from their PC, tablet or mobile phone – for maximum control of their schedule at minimum effort.

## Main Features:

* Q‑nomy's appointment scheduling platform allows setting up, configuring, and managing staff calendars and resource availability.
* Q-nomy's [Visit Management App](https://www.qnomy.com/visit-management-app) offers mobile users the option to schedule and check in for appointments.
* Administrator interface allows configuring clinic and physician working hours, appointment capacity, overbooking limits, appointment types, appointment durations, and more.
* Easily set up complex treatments involving multiple stages, staff members, and resources. The system automatically searches for optimal scheduling where all required staff and resources are available.
* Calendar owner interface allows  opening and closing calendars, managing changes in staff schedules, rescheduling appointment blocks and so forth.
* Clinic and medical office staff interface for scheduling appointment and reviewing appointment scheduled through other channels.
* Easy management of waiting lists, and automated assignment of released calendar slots to pending appointment requests, based on priority and urgency.
* Automated reminders send patient reminders that include appointment details, preparation instructions, and so forth. These reminders can be printed when scheduling the appointment, or emailed/sent as an SMS afterwards and a few hours before the appointment.
* Patient appointment data integration with Microsoft Exchange, Outlook and any HL7-compliant software.
* Scalable appointment software for any number of hospitals, medical practices, clinics and doctors.
* All configuration settings are parameter based, require no programming, are done remotely from the server and affect all departments immediately.

**4.2. Online Medical Appointment Scheduling System (2016-2017)**

The accessibility to services of web clinic is of utmost importance for success of any companies. Internet is a great way to make a clinic known to a large number of people that might potentially be interested in the services that the clinic might provide. Therefore, a creation of a website that would provide different information about the clinic and allow the management and scheduling of appointments online might benefit in many ways to an existing clinic. In order to minimize the costs and time needed to develop, deploy and maintain the website for appointments, different researches have to be conducted until finding the optimal technologies to be used in the process. While researching we found out the existence of CMS systems that potentially reduce the cost and time spent of all the three steps spoken before. The different technologies, such as webserver, programming language and DBMS to be used, were chosen in base of what CMS was chosen. The interest fell on WordPress, one of the most used systems worldwide, which is very easy to use and maintain. The resulting system allows current and future patients to easily make appointments with different doctors of the clinic 24 hours a day, 365 days of the year. In addition, this allows to unload the clinic’s staff from a lot of work that had to be done before the website creation.

Advantages:

* Less interaction needed with staff: since the appointments can be made online now, receptionist will be freer during the day and will be able to manage their time much more effectively.
* Reminders: with online appointment scheduling system, it is possible to develop a plugin that will send notifications to all the patients that have appointments scheduled in some number of days.
* Automatic holiday and non-working days management: Receptionist can easily add all the non-working days for both clinic and/or different doctors. The appointment making system will take into account these while patients make appointments.
* Automatic appointment confirmation: Every time a patient makes an appointment online he will receive an email confirming that he made an appointment successfully.
* Easy appointment management: patients, when logged in their accounts, can easily consult the upcoming appointments and do several operations around them.
* Easier appointment management for doctors: doctor will be able to see all the appointments made with him and manage them accordingly.
* Faster queue times: receptionist can manage easier the appointments making waiting times faster.

**4.3. Design and Implementation of Patient Management System**

This study investigated online hospital management system as a tool to revolutionize medical profession. With many writers decrying how patients queue up for hours in order to receive medical treatment, and some end-up being attended to as „spillover‟, the analyst investigated the manual system in detail with a view to finding out the need to automate the system. Subsequently, a computer-aided program was designed to bring about improvement in the care of individual patients, taking the advantage of computer speed, storage and retrieved facilities. The software designed will take care of patient‟s registration, billing, treatment and payments. The programming language employed in this work was Microsoft C#.

**4.4. OHP-014**

A computerised queue management system in the outpatient pharmaceutical care unit of a hospital pharmacy service (2014)

The large number of patients for whom medicines are dispensed in our Hospital Pharmacy Service has caused us to seek a system for control, order and proper monitoring. Queue management systems (QMS) are hospital information systems that organise patients in outpatient consulting waiting rooms (OCR).

Hospital: eliminates manual system for recording work done, provides information about opening and closing times, records the pharmacist who dealt with each patient, follow-up consultations, reasons for not attending and produces statistics.

Pharmacy Department: eliminates FIFO queue; provides real time information on the patients in the waiting room (arrival time, advances or delays in relation to their appointment time); increasing compliance with appointments.

Patient: more orderly access to OCR at the Hospital Pharmacy Service; improved arrival flows; reduces unscheduled patients checking in; reduces waiting times.

**4.5. Healthcare| Hospitas Queue Management System**

#### Queues are primarily formed when customers request for a service. In healthcare, patients are the customers where outpatient clinics, laboratory diagnostic centres or hospitals are the service facilities.

In a typical healthcare centre, it consists of one or more service counters with one or more servers where patients are entertained. Mostly queues formed at healthcare facilities are ubiquitous and cause a lot of frustration as prolonged delay in services are observed. This results in patient discomfort resulting in medical conditions that can increase subsequent treatment costs and poor health outcomes.

Given the problems and negative consequences faced by patients due to poor queuing at healthcare patient flow management systems arise as the best solution to overcome this problem. Our patient queue management system makes your patient service area more informed and increases operational efficiency.

Queue solutions are specially designed for outpatient clinics, laboratory diagnostic centres and hospitals. Our queue management systems helps you manage a seamless flow of patients from an initial entry point to check out. The system allows to facilitate process efficiency and improve overall operational excellence at healthcare facilities by enhancing the patient experience.

From patient check-in to patient calling and appointment management, all integration facilities are optimized using patient flow management system.

**Benefits:**

* Management of patient queues more efficiently and conveniently
* System allows real time queue status information
* Reduces patient wait time and service time considerably
* Makes service areas less crowded with patients
* Multilingual interface
* Clearly shows length of wait of each patient
* Real-time reporting allows efficient management of hospital services
* Makes operational tasks more systematic as doctors are alerted when waiting times are exceeds

**5. Proposed Methods/Procedure**

This study will be accomplished through the following:

1. **Designing**

**A.1. Information Gathering**

As the pilot testing it will be held in Capitol University Medical Center it is necessary to collect information needed from the clinic staff and patients such as schedules of the doctors and patients. After getting data, it will be diagnose interpreted problems and recommended improvements needed in the system.

**A.2. Designing the System Flow**

Describing the desired features and operation/s in detail and other documentation.

**A.2.1. Context Diagram**

**A.3. Designing the GUI of android mobile application**

With the use of ionic material designs, the android pages will be designed according to the created system flow. A mobile application which will provide the clinic staff and patients a user-interface to easily use the app.

1. **System Performance Evaluation**

**B.1. Usability**

During the pilot testing, the usability of the system will be evaluated. Output of the Android application will be compared from traditional system.

**C.2. Functionality**

During the pilot testing, the functionality of the system will be evaluated. Output of the Android application will be compared from traditional system.

**6. Proposed research timeline and targets**

**VII. References**

1. <http://www.columbia.edu/~vt2196/AdvanceSchedulingMSRevision2.pdf>

2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5425771/>

3. <https://www.hybrain.co/products/medtrix-hospital-information-system/>

4. <https://riunet.upv.es/bitstream/handle/10251/88831/CARA%20-%20Sistema%20de%20cita%20online%20para%20una%20consulta%20m%C3%A9dica.pdf?sequence=1>

5. <https://www.qnomyhealth.com/medical-appointment-scheduling>

1. https://riunet.upv.es/bitstream/handle/10251/88831/CARA%20-%20Sistema%20de%20cita[%20online%20para%20una%20consulta%20m%C3%A9dica.pdf?sequence=1](https://riunet.upv.es/bitstream/handle/10251/88831/CARA - Sistema de cita online para una consulta m%C3%A9dica.pdf?sequence=1)
2. <https://www.academia.edu/27145315/DESIGN_AND_IMPLEMENTATION_OF_PATIENT_MANAGEMENT_SYSTEM>
3. <https://ejhp.bmj.com/content/21/Suppl_1/A190.1>
4. <http://queuemanagementsystems.com/solutions/healthcare/>