COLLEGE OF COMPUTING AND INFORMATION SCIENCES

MY DOCTOR, DISEASE DIAGNOSING MOBILE SYSTEM

By

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DEPARTMENT OF COMPUTER SCIENCE

SCHOOL OF COMPUTING AND INFORMATICS TECHNOLOGY

A Project Proposal Submitted to the School of Computing and Informatics Technology For the Study Leading to a Project Report in Partial Fulfillment of the Requirements for the Award of the Degree of Bachelor of Science in Computer Science Of Makerere University

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1 Introduction

Health is one of the most essential services required by all people in the country. This implies that, maintaining good health among the people ensures a high standard of living in the nation. Therefore, all possible means have to be adopted so that the welfare of Ugandans is well maintained.

1.1 Background

Many people in Uganda face a challenge of high hospital dues incurred to acquire reasonable health treatment. These medication fees are charged from the time of going to the hospital up to the time of departure. Such charges include hospital registration fees, hospital consultation fees, checkup fee, actual medicine prices and so on. These fees are charged in almost all hospitals within the country and the amounts paid range from public to private hospitals. For example, Mengo hospital, a public hospital charges about 8000/= as consultation fees on addition to other charges like blood checkup and medicine fees. (MengoHospital, 2017)
As a result, majority of the people end up dodging most of these charges and only buy the medicine for the diseases which they think that they are infected with. This has been evidenced by the recent research we made that showed about 70% of the people in Uganda take medicine without first visiting health centers. This has led to death arising from treating wrong diseases never the less wastage of money. (Musinguzi, 2013)

1.2 Problem Statement

The problem this project will address is wrong medication taken by the people due to inadequate medical guidance from doctors as some patients tend to dodge consultation fees which are charged by the different hospitals. On addition to that, the inadequate number of medical personnel in hospitals which has been reflected by the long queues made by patients in most public hospitals lead to delay of cure to patients who access such hospitals. (InterPressService, 2017)

1.3 Objectives

1.3.1 Main Objective

To develop a system that identifies and ranks a disease basing on the signs and symptoms inserted by the user.

1.3.2 Specific Objective

- To carry out research about the different signs and symptoms of the different diseases.

- To design a database that stores the signs and symptoms of the various diseases.

- To develop an algorithm that maps signs and symptoms to their respective diseases.

- To develop a mobile application that implements the design above.

1.4   Scope

This project will focus on maintaining the health of the people in that, the patients will do self-medication through inserting the signs and symptoms of a particular disease in the mobile application and the system will return an appropriate disease after ranking the inserted information (signs / symptoms) to a particular disease. This project will require us to go to different hospitals seeking for essential medical information from doctors and other health officials concerning diseases plus their respective signs and symptoms which are reflected on a human being. (AddictionCampuses, 2017)

Information about the different signs and symptoms of different diseases will also be achieved using symptom checker, a web application which enables the user to click on different human body parts and it returns a list of different signs and symptoms of a particular disease and list of possible diseases that affect that particular body part. (WebMD, 2017)

The project will also support patients in getting free consultation from the doctors using their mobile phones as free toll lines for contacting different medical assistants for guidance on health will be provided by the application. The system will be a mobile based application running on android platforms thus we are to use the android resources, online resources. This implies that android smart phone users are the target clients to access all the services that are to be provided by the disease diagnosing system. (AndroidAuthority, 2017)

Data collection methods to be used will include direct interviewing, using questionnaires, browsing health based websites and observation to acquire information which will help us implement the disease diagnosing system. (KenPro, 2017)

1.5   Significance

The project will enable most users (patients) who wish to take a greater role in the maintenance of their own health and who are often competent to manage (uncomplicated) chronic and recurrent illnesses (not merely short-term symptoms) after proper medical diagnosis. (Wikipedia, 2017)

The project will help the patients who are understandably unwilling to submit to the inconvenience of visiting a doctor for what they rightly feel they can manage for themselves, given adequate information

The project will promote remote medical consultation pursued as a means of overcoming the unequal distribution of clinical expertise. It is a method of offering expert consultations to patients in remote rural areas.(Melisa & LUK, 2017)

The project will provide a lower cost-alternative for people who cannot afford the cost of clinical services for example consultation costs in most hospitals in Uganda.

This project will provide the patients with the disease or list of possible disease their suffering from after inserting the signs and symptoms in a short period of time.

The project will move patients towards greater independence in making decisions about management of minor illnesses, thereby promoting empowerment. (Odell, 2017)

2 Literature Review

2.1 Overview

Medical assistants are quite important as they are key influencers of the relationship between the physician and the patients. The medical assistants are vital in enhancing the effectiveness of the physician as far as treatment is concerned. Flight argues that the medical assistants are at times closer to the patients and thus are able to gather complaints from the patients concerning their care or any other issue regarding the treatment. He notes that the medical assistants should carefully listen to the patient and, "make a memorandum for the physician of the complaints listed". He goes further to note that in case of lack of cooperation from the patient the medical ought to make a note and attach it to the patient's records for the physician. This description makes it clear that the medical assistants' positions cannot be taken for granted because of what their capability to influence the physician -patient relationship. (ExlusivePapers, 2017)

This is quite advantageous as the patients are catered for by the doctor and the required services are provided to them whenever there is need. However, this procedure is so costly as the doctor has to be facilitated regularly for the services he renders to his patients.

The Personal Health Care Journal, explains and illustrates on how one should take an active role in maintaining his/her health as it emphasizes the issue of protecting personal information, detecting errors, fraud and abuse as well as reporting mistakes or questions to the officials in charge. It goes on and elaborates more on the issue of consistency and accuracy by reflecting how one can schedule and document his/her medical status on the different days of the year. (UnitedStatesAdministration, 2017)

2.2 Existing Disease Diagnosing systems

2.2.1 Using Personal Doctors

Today in the country, some people have got private doctors who take care of them by providing them services like regular medication after a given time period. The patients therefore, take on the initiative of moving to the respective hospitals every after a given time period. Doctors maintain their reputation by providing the right medication to their patients so that the health of the people is kept good at all times.

This is quite advantageous as the patients are catered for by the doctor and the required services are provided to them whenever there is need. However, this procedure is so costly as the doctor has to be facilitated regularly for the services he renders to his patients.

2.2.2 Musawo Ug mobile Application

The Musawo mobile application is also considered as a personal doctor assistant app for the services a patient can get once he/she uses the app. It enables a patient to book health related appointments, order and have drugs delivered to the patient, get emergency services, view hospitals in Uganda and get to know their respective information, interact with doctors and get engaged in a question and answer chat. Musawo is perfect for people in need of instant information, advice and actionable next steps. You might be among the big population who

search online for health advice and possible diagnosis before visiting the doctor. Maybe you are too busy and you do not find time off your busy schedule to visit a doctor or maybe you cannot get an appointment very soon, or you get sick out of hours or on weekends. If this is you, then Musawo is your perfect companion. (dappsforpc, 2017)

2.2.3 Symptom checker online web platform

Symptom checker is an online web platform that enables a user to click on different human body parts then after, the system returns a list of possible diseases that can affect the selected body part. The system also ranks the diseases with the would-be signs and symptoms for a selected body part. It is quite an interesting system to interact with.
The advantage of the site is being user friendly as it enables a user to navigate and check the possible diseases on each body part he/she selects. However, the disadvantages are it requires internet connectivity full time since it is a web based online platform and also medical guidance towards treating an identified disease is not clearly put into consideration by the site. In addition to that, the mobile view of the site congests the screen as a user is using the system. (WebMD, 2017)

2.3 Conclusion

In conclusion, My Doctor Disease Diagnosing mobile system is to focus on maintaining good health of the people by helping them understand the possible diseases affecting them basing on the ranking of the inserted signs and symptoms to the different diseases and providing them with possible solutions of treating the identified diseases.

3 Methodology

3.1 Research Design

The design of our research will base on the quantitative and qualitative approaches which will enable us get the quantifiable measurements and quality of data or information respectively.

3.1.1 Data collection

The system will require medical data or information about the various diseases, their signs and symptoms and their treatment methods or medication. This will also require information about the working principle of disease diagnosis. To acquire this information, the following research tools will be deployed in order to acquire the required information.

3.1.2 Questionnaires

These will contain both open and closed-ended questions to enable us acquire relevant information from different people in different hospitals.

3.1.3 Direct interviews

This will involve reaching out to the medical personnel in hospitals and clinics to find out more about disease diagnosing.

3.1.4 Online sources

Some data will be accessed and retrieved from the internet majorly the medical and health websites.

3.1.5 Target Audience

The first target audience for this data collection will be the doctors and nurses from some hospitals and medical clinics like Mulago Hospital, Mengo Hospital, Jorum Pharmacy, etc to provide us with medical information like drug prescriptions, and so on. Our other target participants are the patients and the rest of the people who we will be able to reach out to. These will enable us to know how they deal with the diseases they face in their day to day activities.

3.2 Data Analysis

The collected data and information from the various sources will be analyzed and put together using Microsoft Excel. This will provide a better view and quick accessibility of the records during data entry into the systems database.

3.3 System Design

An object oriented analysis model is to be followed as the system design model which is reflected by a use-case model as drawn in the appendix section of this proposal.
The use-case diagram elaborates more on the interaction, a user is to have with the system as well as the overall flow of the My Doctor, Disease Diagnosing system. A user is to insert his/her details (name, age, date of birth respectively in appropriate fields as required. After which he/she is able to insert any sign/ symptom for some disease he is likely to be facing. The system then searches and ranks the inserted symptom to an identified disease matching to the inserted sign/symptom. The user is now able to view the resulting disease he/she is likely to be infected with.

3.4 Implementation

The implementation phase will include the following aspects:

3.4.1 Build a Database

Basing on our ER diagram, we will use MySQL to build a database that will hold the various diseases, their signs and symptoms and the required medication for each case.

3.4.2 Developing a search and ranking algorithms

We are to develop a disease search algorithm using PHP that retrieves a disease or list of possible diseases basing on the suggested signs or symptoms by the user and also a disease ranking algorithm that returns an ordered list of disease possibility depending on the signs or symptoms presented by the user.

3.4.3 Developing an Android Application

We will develop an android application called My Doctor that connects to the database. This application will be created using XML for user interface designing, Java for implementing the functionality and JSON for connecting to the database.

3.5 Testing

During the development process, unit testing will be done to ensure all modules are built correctly. System integration testing will be done after we have built and tested all the components and then we will combine them into the application.
We will develop a simple web interface using HTML and CSS to test to functionality of the algorithms with the database before integrating them into the application.

3.6 Evaluation

After we have finished all the testing, we will evaluate the system to check whether it fulfills our objectives or not.

4 References

AddictionCampuses. (2017). *5 signs you may be self-medicating essay topics.* Retrieved from
`http://www.addictioncampuses.com/resources/addiction-campuses-blog/`
`5-signs-you-may-be-self-medicating/`

AndroidAuthority. (2017). *Android authority.* Retrieved from `www.androidauthority.com`

dappsforpc. (2017). *Download musawo for pc windows and mac 1.0.0.* Jengastudios.
Retrieved from
`http://www.dappsforpc.site/download-musawo-for-pc-windows-and-mac/com.`
`ionicframework.musa853179.html`

ExlusivePapers. (2017). *Medical assistant and patients relationship essay topics.* Retrieved
from `https://exclusivepapers.com/essays/medicine/medical-assistant-and-`
`patient-relationship.php`

Gary B. Shelly, H. J. R. (2012). *System analysis and design ninth edition.* Nicole Pinard.

InterPressService. (2017, Oct). *Health uganda self medication blamed for increased drug
resistance.* Retrieved from
`http://www.ipsnews.net/2011/07/health-uganda-self-medication-blamed`
`-for-increased-drug-resistance`

KenPro. (2017). *Journal publication process: Format and criteria - kenpro.* Retrieved from
`www.kenpro.org`

Melisa, & LUK, A. P. M. (2017). Asynchronous remote medical consultation for ghana.

MengoHospital. (2017). *Private outpatients unit.* Retrieved from
`https://mengohospital.org/clinic-2/private-outpatients-unit`

Musinguzi, C. (2013). Patient waiting time and associated factors at the assessment center.

Odell, J. (2017). *Clinical decision-making in minor illness.*
`http://eds.b.ebscohost.com.`

UnitedStatesAdministration. (2017). *Personal health care journal.* SMP.

WebMD. (2017). *Webmd symptom checker.* Retrieved from
`https://symptoms.webmd.com/introView`

Wikipedia. (2017). *Chronic condition.* `https://en.m.wikipedia.org/wiki/`.

Appendices

Appendix A: Activities Time Table

| TASKS	TIME
Research (Data Collection)	2 Weeks
Organizing data and data analysis	1 Week
Database design and implementation	3 Weeks
Implement search and ranking algorithms	4 Weeks
Develop interfaces for testing the algorithms	1 Week
Developing the mobile application	6 Weeks
Testing and evaluation	1 Week
Documenting the final project report	3 Weeks

Appendix B: Ghant Chart showing the Activities Plan for My Doctor, Disease Diagnosing Mobile System
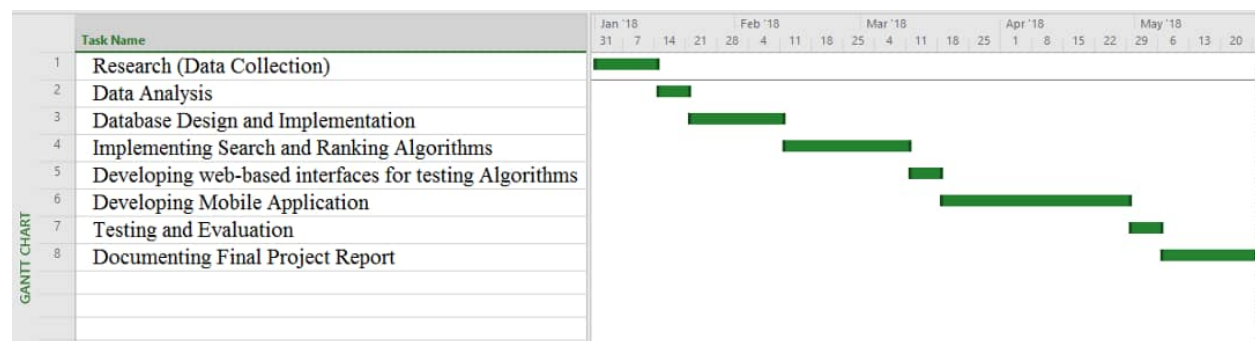
Appendix C: Financial Requirements

Requirement	Quantity	Unit price (UShs)	Total price
Laptop	1	1,200,000	1,200,000
Internet Data	90GB	5500	495,000
Questioniares	50	200	10,000
Interview Guides	20	200	4,000
Web Hosting	12 Months	13000	156,000
Total			1,865,000

Appendix D: Usecase Model for My Doctor,Disease Diagnosing Mobile System as shown above
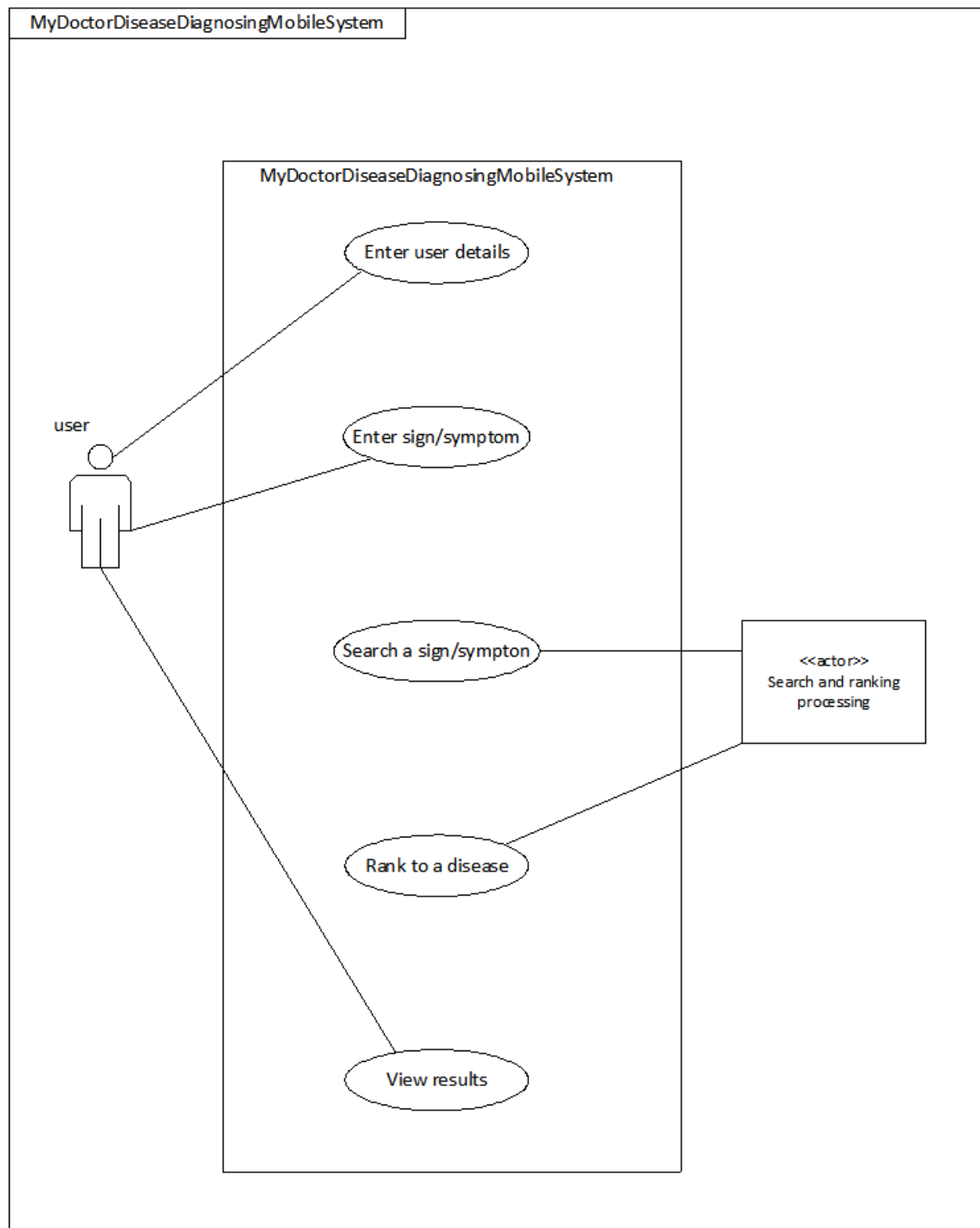
(Gary B. Shelly, 2012)

Appendix E: Questionaire to be used in information gathering

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FINAL YEAR PROJECT RESEARCH QUESTIONNAIRE

MY DOCTOR, DISEASE DIAGNOSING MOBILE SYSTEM

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INSTRUCTIONS: Please tick in the box next to the answer of your choice or write in the space provided as the case may be.

1   Choose your gender?

☐ Male   ☐ Female

2   Choose your age category:

☐ (18-25)years   ☐ (26-35)years   ☐ (36-45)years   ☐ Above 45 years

3   Do you go to the hospital for medical checkup?

☐ Yes   ☐ No

3.1   If yes, how often do you go there?

☐ Once a week   ☐ Once a month   ☐ Once a year   Other (Specify)………………..

3.2   What makes you go for the medical checkup?

☐ In case am not feeling well   ☐ in case of a symptom   Other(Specify)………………………….

3.3   If no, what limits you from going to the hospital for medical checkup?

☐ Hospital charges   ☐ Ever busy   ☐ Have family doctor   ☐ Not interested

4   In case you fall sick or not feeling well, what do you do?

☐ Go to the hospital   ☐ Buy medicine   ☐ Consult family doctor

5   Do you own a smart phone?

☐ Yes   ☐ No

6   What would you prefer in case you are sick or if you sense any sign/symptom of a disease?

☐ Self-medication   ☐ Go to the hospital

7   If you like self-medication, do you wish to use a medical assistant mobile application?

☐ Yes   ☐ No

Thank you for your cooperation, May God bless you.