ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24MAR1504

Develop an Extended Model for the Data Management System for Inter-Hospitals on Client Medical Services

(Area of Focus: Health Sector)

Thierry Mwesige[1]; Dr. Wilson Musoni[2] (PhD)
Masters of Science with Honors in Information Technology, at University of Kigali, Rwanda

Abstract:- This study aims to implement a data management system that connects three regional hospitals and shares patient information to improve the services provided to patients, especially those treated in Kigali city. When the patient arrives, apart from what is written on the transfer sheet, there is no information about the illness, even though the patient had been hospitalized at the district hospital for many months. These issues drastically reduce the quality of service for patients, where they are often asked to repeat the symptoms, they receive poor treatment where each doctor first tries a drug and the patient has outgrown it, usually forcing the patient to start a new treatment. The research adopts descriptive research survey and the instrument used for the study was a questionnaire developed to cover the research questions and hypotheses. Forty-seven respondents were randomly selected from the population of the Study. The result from respondents was shown the need of the implementation of a data management system that connects three regional hospitals and shares patient information with the general hospital of CHUK to improve the services provided to patients, especially those treated in Kigali city.

I. INTRODUCTION

The development of an extended model for the data management system for INTER-HOSPITALS on client medical services is a complex and challenging task. It requires a deep understanding of the needs of the interhospital system, the data that needs to be shared between hospitals, and the types of services that will be provided to clients.

In this study, a comparative study approach was adopted to examine the link between the predict variable (the independent variables) and the criterion variable (dependent variable). Two or more scores were obtained from each individual in the sample, one score for each variable. This research approach will be suitable and fitting to our study because the researcher had to collect data based on current situation of health service provided to demonstrate the impact of INTER-HOSPITALS data management system to improve health service.

II. METHODOLOGY

A. Data Collection Methods and Instruments/ Tools

Data collection is the process of acquiring information using predetermined methodologies in order to respond to the study's predetermined research topic. In this research, the researcher will use a questionnaire as the research instrument and examine secondary data. It has been stated that approaching people with questions is an obvious way to gather both quantitative and qualitative data from them. The survey method is used in this study to gather data. (Walliman, 2021).

- *Collaboratory of Google*

Available to use, Colab is a cloud-based Jupyter notebook environment. Most significantly, it doesn't need to be set up, and, like Google Docs pages, the notebooks you create can be edited simultaneously by members of your team. Colab supports a number of popular machine learning libraries that can be rapidly loaded into your notebook.

- *Python*

Python is a high-level, interpreted, general-purpose programming language. Its design philosophy prioritizes code readability and makes extensive use of indentation. Python is a dynamically typed, garbage-collected programming language. Because it is the simplest way of sampling participants are chosen based on their availability and desire to participate the study used convenience non-probability sampling. (Hope, 2021).

B. Data Analysis

The process of discovering solutions through investigation and interpretation is known as data analysis. Understanding survey and administrative source results and presenting data information require data analysis. Data analysis is anticipated to provide light on the subject of the study and the respondents' perceptions, as well as to increase readers' understanding of the subject and pique their interest in this portion of the research. Google Collab will be used to analyze the data and present the results using data analysis tools used in scientific analysis. (Burns, 2022).

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C. Research Design

A research design is a plan or blueprint which shows how data required for the solution of the problem that the researcher will focus on, the procedure and methods for data collection and analysis, will answer the research questions. In these lines the research herein the present study, researcher would employ a combination of descriptive and correlation research design to describe the characteristics of a population under investigation and carefully examine the impact of INTER-HOSPITALS data management system on health services provided. (Hardt,2016).

The flowchart illustrates how the System works in summary. It begins with doctor login and successful authentication, leading to the dashboard. From there, doctor can add new patient and make consultation for him/her. If there is Lab Test required get test and send to the Laboratory after that the doctor can check the Lab Results then he/she give the patient the treatments.

The second option is that the doctor can search patient using ID passing through Dashboard on Search Patient by putting Patient ID if he/she comes for the second time or more time viewing details, and the system gives you an option to add new consultation, and he continue to process, If there is Lab Test required get test and send to the Laboratory after that the doctor can check the Lab Results then he/she give the patient the treatments.

After all the Doctor can sign out the system. And this happens for all Hospitals: Kibagabaga Hospital, Masaka Hospital, Nyarugenge Hospital, CHUK Hospital.

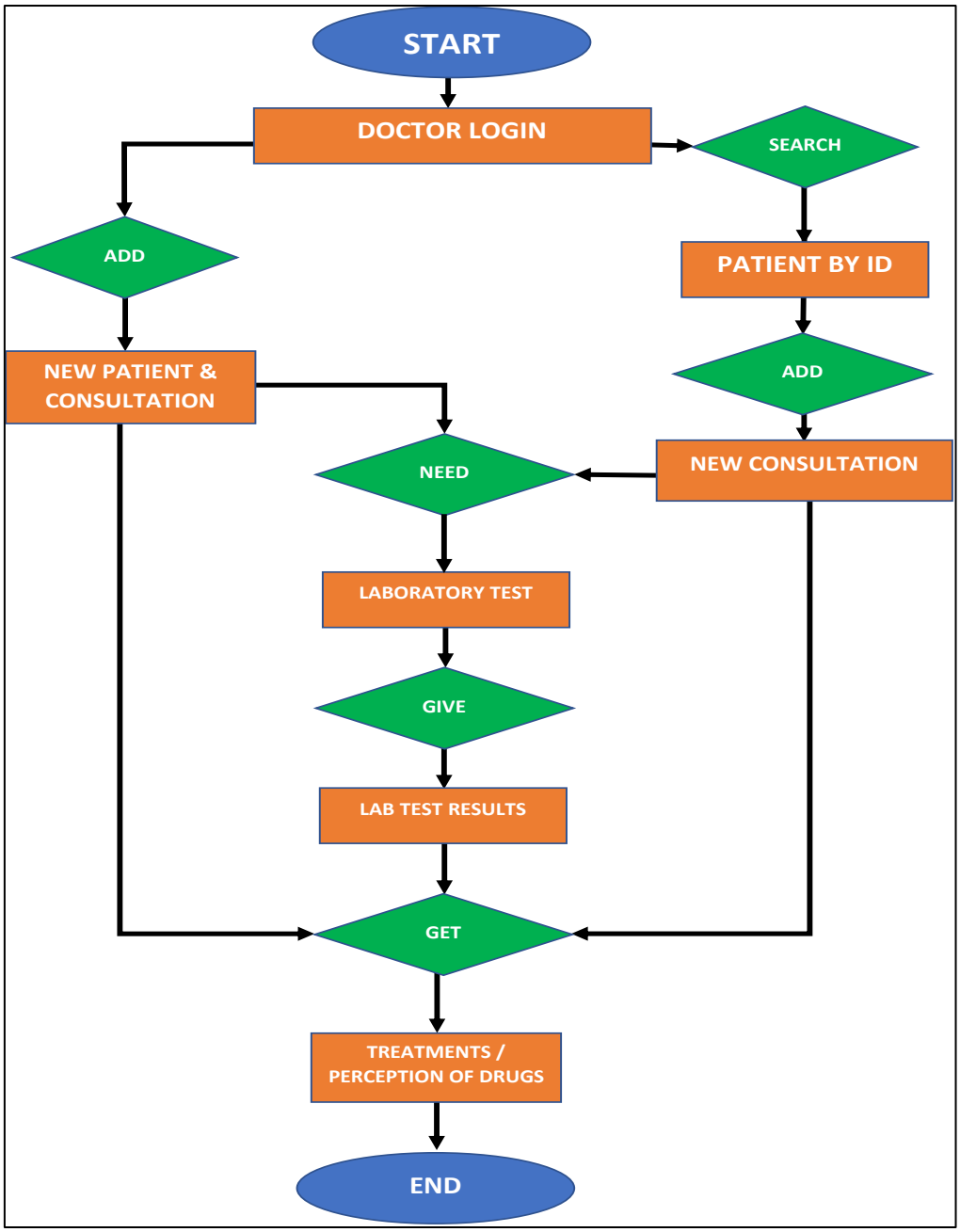

Fig 1 Interhospital Information Management System Flowchart Diagram

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III. CONCEPTUAL FRAMEWORK

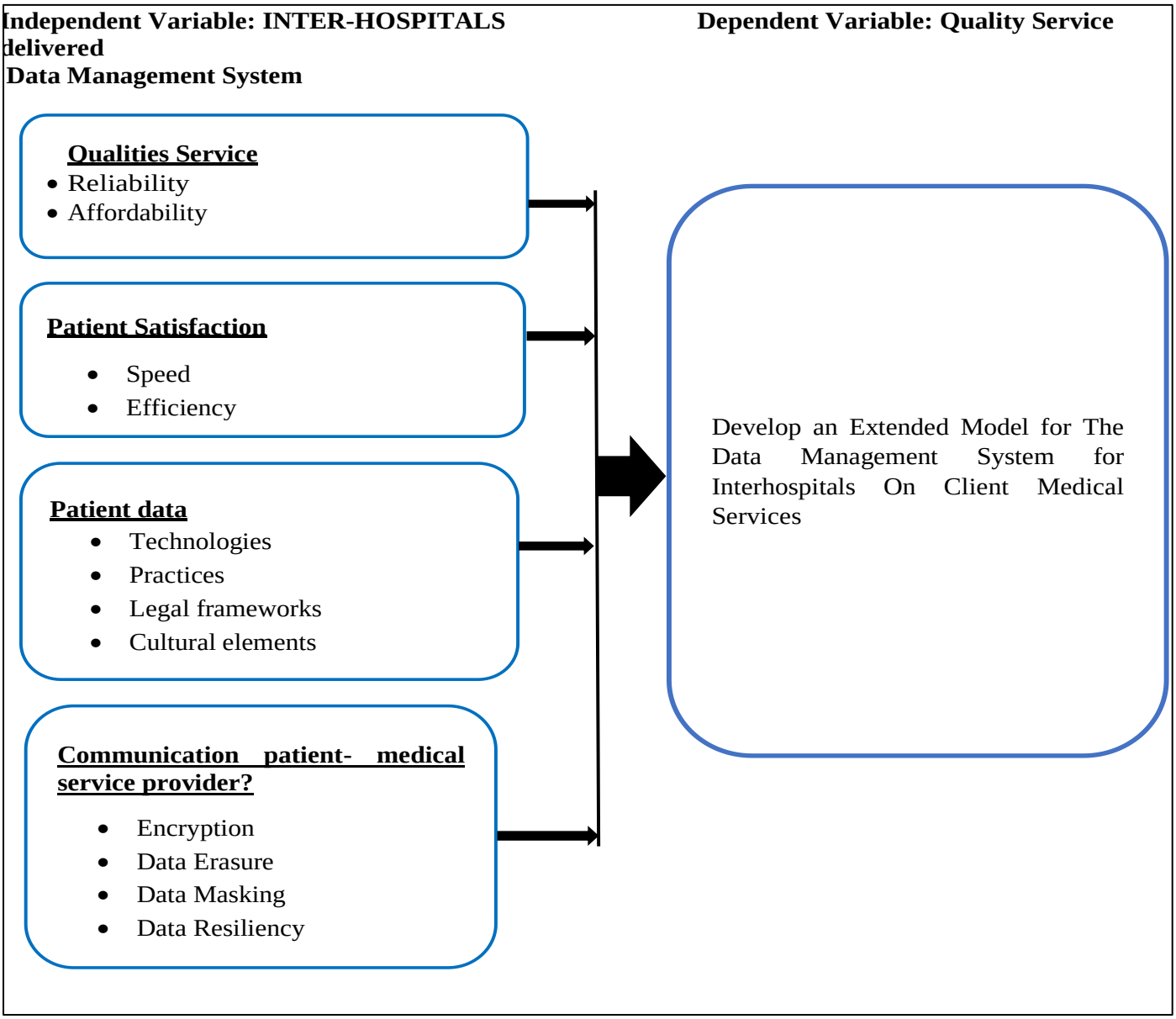

Fig 2 Conceptual Framework

IV. DATA PRESENTATION, ANALYSIS AND INTERPRETATION OF FINDINGS

➢ *Introduction of the Contents of the Chapter*

This chapter comprises of data presentation and interpretations of findings on the impact of interhospital information management system on client service provided specifically in Kigali public hospital. Under this chapter, data were analyzed based on objectives of study. The data collected served as tool to measure the results obtained from the field. Also includes a brief overview of the technologies used to make the application, operation, tests that have been applied, the weakness observed in the information management system current systems, screenshots of how the system works. Last but not least, software and hardware compatibility requirements.

In this chapter we shall demonstrate step by step how the system developed to help some hospitals in Kigali city as our Case Study. Those hospitals are located in all districts of Kigali city where in Kicukiro District there is Masaka Hospital, in Nyarugenge District there is Nyarugenge Hospital and CHUK Hospital, and in Gasabo District there is Kibagabaga District.

➢ *Kigali City Data Management System for INTER-HOSPITALS Map*

This map demonstrates where all hospitals the research based are located in Kigali city.

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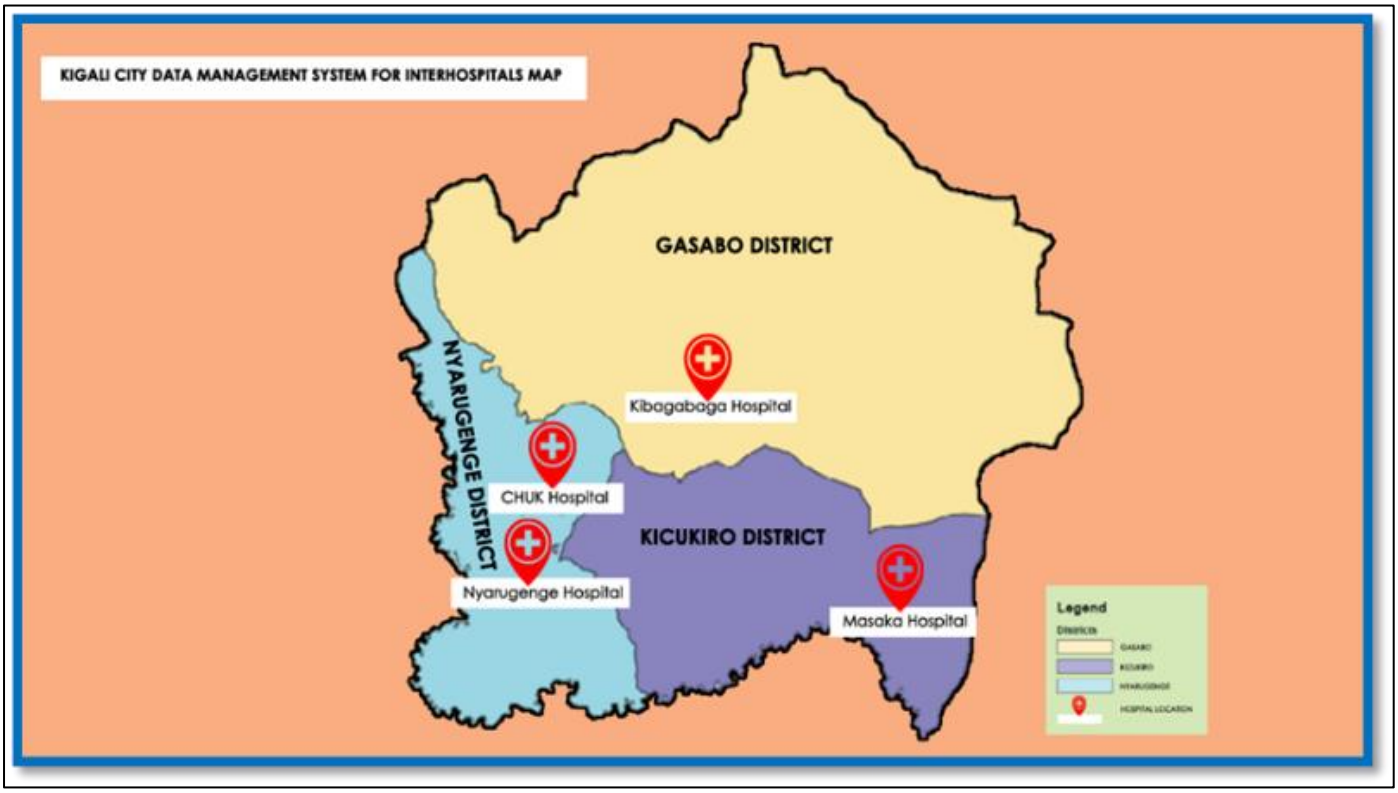

Fig 3 Kigali City Data Management System for INTER-HOSPITALS Map

➢ *Interhospital Information Management System*

This presentation describes the whole process of configuring the Interhospital Information management system, when the patient is treated in one of the three district hospitals in Kigali City, the information will be shared in the other district hospitals even in Centre Hospitalier Universitaire de Kigali (CHUK) so that when from different reasons if the patient will have to change the hospital of care, it will not be necessary to restart the record of information and treatment. The figure below shows us how the Dashboard looks after sign in the system in Kibagabaga Hospital.

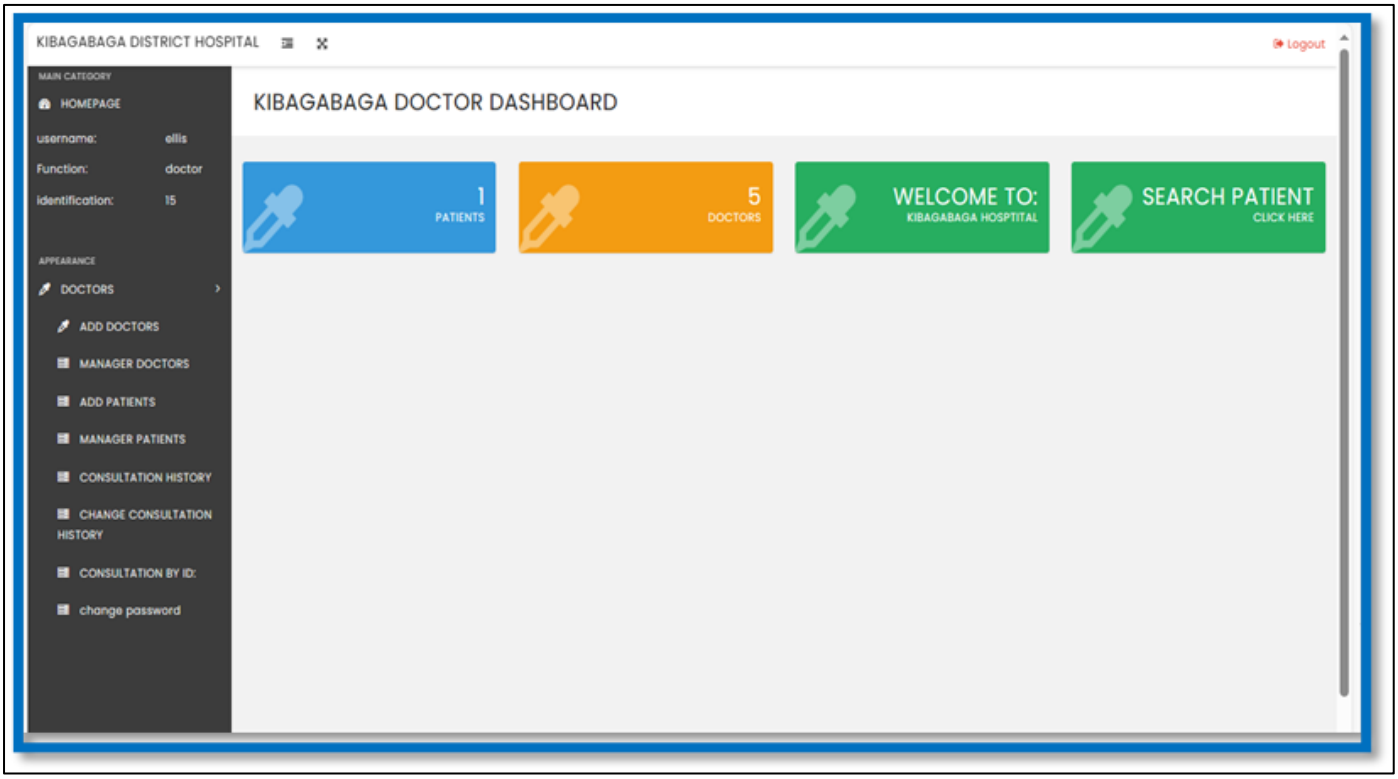

Fig 4 Interhospital Information Management System Dashboard

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24MAR1504

Dashboard of the system shows us the Hospital Doctor Hospital dashboard, Welcome Page of Hospital we signed In, Patients, Doctors, and search Patient on the main Page. And on the left side there is many Page Menus like HOMEPAGE Menu, it show also the username, Function, Identification ID, and the page of APPEARANCE where we find the menus like Doctors, Add Doctors, Manage Doctors, Add Patients, Manage Patients, Consultant History, Change Consultation History, Consultation by ID and Change Password Menu which is the last one, and also in the up right corner there other button which Logout of the system. Briefly we are going to show some menus and their functions in the system. The figure below shows us how the Dashboard looks after sign in the system in Kibagabaga Hospital.

➢ *Search Patient on Dashboard*

Search Patient on dashboard , the doctor can search patient using ID passing it by putting Patient ID if he/she comes for the second time or more times viewing details, and the system gives you an option to add new consultation, and he continue to process, If there is Lab Test required get test and send to the Laboratory after that the doctor can check the Lab Results then he/she give the patient the treatments.

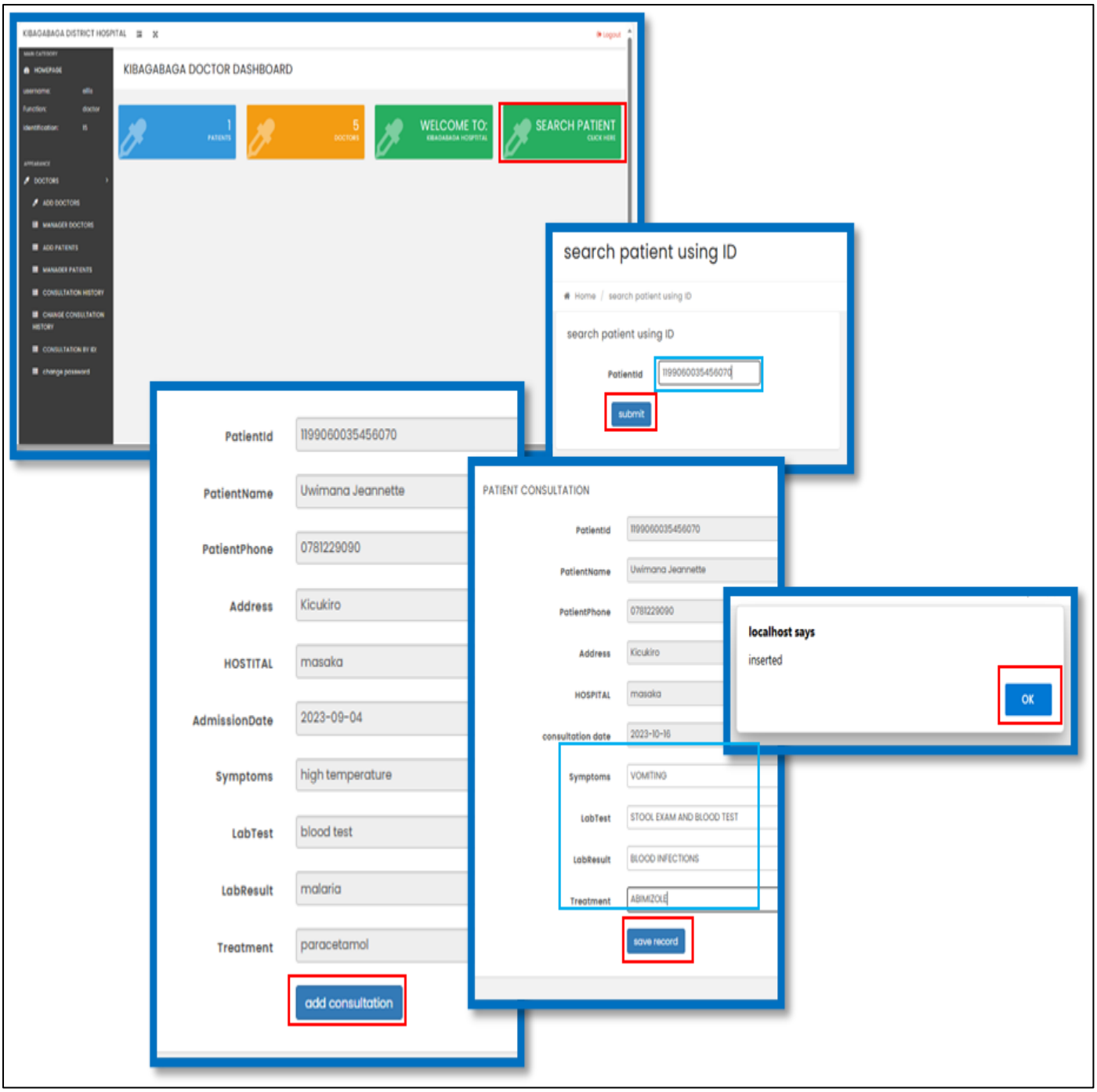

Fig 5 Search Patient from Home Page

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➢ *Briefly the System Developed has Many Menu but to First of all you have to :*

- LogIn on The System
- Create account as doctor
- After creating account LogIn on the system with Credentials
- First menu on the dashboard is Add doctor where we can manage all doctors (edit, manage, updates, delete,…..)
- Second menu on the dashboard is "Add Patient where we can also manage Patients, edit, update information about patient,…..
- 3rd menu on the dashboard is: Consultation History which helps the doctor to see all patients records in the system and Consultation by ID menu button which helps the doctor to see one patient records in the system by using his / her PatientId and can add other new records.
- The last menu is Change Password menu button from home page which helps the doctor to change his password in case he/she needs.

➢ *Analysis of Findings*

After the configuration of the system that connects three district hospitals Kibagabaga, Masaka and Nyarugenge with the Centre Hospitalier de Kigali (CHUK), the information of a patient recorded in Kibagabaga Hospital will be view and updated in Masaka Hospital, Nyarugenge Hospital and CHUK. The system enables also the information of a patient recorded Masaka Hospital to be viewed and updated in Kibagabaga Hospital, Nyarugenge Hospital and CHUK. On the other hand, the information of a patient recorded in Nyarugenge Hospital will be view and updated in Masaka Hospital, Kibagabaga Hospital and CHUK. Finally, the functionality of this system helps doctor from Masaka, Nyarugenge and Kibagabaga Hospitals to view and update the information of patients recorded in CHUK.

As recommended by respondents from the research conducted, the availability of patient's information in the four hospitals simplifies the acts to be done and the forms to be filled that complicates the services to be delivered.

V. CONCLUSION

The aim of the research was to develop an extended model for the data management system for INTER-HOSPITALS on client medical services. After implementation of our project, we ensure University of Kigali and Rwandan Government that data management system that connects three regional hospitals and shares patient information with the general hospital of CHUK improves the services provided to patients, especially those treated in Kigali city. We can conclude that the objectives of this project have been successfully met and they are as follows:

- To analyze the perception of patients in Kigali City Hospitals toward qualities service provided
- To demonstrate the impact of patient data toward patient satisfaction.
- To develop an interhospital data management system prototype.
- To improve communication patient- medical service provider by information shared in Kigali City Hospitals

RECOMMENDATIONS

We cannot come to the end of this report without making the recommendations for the implementation of Interhospital Information Management System. So, at the completion, the following pieces of advice are created:

- The researcher recommends that the next researchers on this topic to extend the system to the all country Health Centers so that the patient from there can be receive within their full information.
- The researcher recommends university of Kigali especially in Information Technology to focus on Internet of things project (IoT) which will go to increase the skills of the student in hardware and also in software.
- The researcher recommends university of Kigali to deal with the expert in health sector to add some input ideas so that our project can be implemented and used on the market especially in the hospitals.
- The researcher recommends the Republic of Rwanda especially the Ministry of Health to adapt and to support all the implementations of this project because it will be helpful.

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