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Centralized Medical Information Management System (CMIMS) for NHIS/TISHIP (A Case Study of Medical Centre, Federal Polytechnic Ede)

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Abstract - The issue of long waiting time and lack of real time access to patient record in public health care facilities has become a major challenge to Nigerian citizens as well as medical personnel. The purpose of this research work is to eliminate the prolonged waiting time of the patient, reduce the idle time of medical personnel and also provide immediate and real time access to patient medical record and medical history. This research will improved accessibility to patient medical record using a centralized database irrespective of the location of patients and medical personnel. Primary data were collected from the polytechnic medical center, Programming language used for the development of the application was Php, Mysql was used to handle the processing and storage of data and WAMP was used for the implementation of the system.

Keywords: Medical, Patients, Personnel, Record, Real time.

1.0 Introduction

Nigeria is witnessing continuing advocacy and increase in number of individuals yearning for computerization of health information and healthcare processes. However, little is known about the opinions of the diverse healthcare providers who would ensure the successful implementation and meaningful use of health information technology in the country (Adeleke, Habib and Erinle, 2015).

Everyday hospitals and clinics which are attached to a large volume of data regarding patients, ailments, prescriptions, medications, medical billing details, etc. Such medical records, are nowadays recorded electronically using computer system and share among medical personnel, hospitals deal with the life and health of their patients (Kierkegaard, 2011) Good medical care relies on well-trained doctors and nurses and on high-quality facilities and equipment. Good medical care also relies on good record keeping. Without accurate, comprehensive up-to-date and accessible patient case notes, medical personnel may not offer the best treatment or may in fact misdiagnose a condition, which can have serious consequences. At present, most hospitals in Nigeria rely on paper based medical records. This traditional method of keeping the medical records of patients comes with a lot of challenges. With a huge number of registered patients, there arises the need for a lot of physical space to be able to keep and store the paper based medical records. Since these systems rely on the handwriting of individual professionals within the hospital (e.g. doctors, nurses, laboratory scientists e.t.c), there can arise the problem of illegibility of writing which can make it difficult to access information at some other times (Ajala et. al, 2015). In many cases also, the patients might have to physically carry these paper based records from one unit of the hospital to another (e.g. from the doctor to the laboratory). This might give them access to some information they should not be privy to. Since the records are also paper based, occurrences like termite attack, fire outbreak, flood e.t.c can destroy such records. In a situation where there are many registered patients, looking for individual records may also take a longer time compared to doing so electronically. In lieu of all these limitations connected with paper based medical records, there arises a need to develop a simplified Centralized Medical Information Management System (CMIMS) to replace the paper based system putting a typical Nigerian hospital setting into consideration. This system is operated by a set of

computers and servers, the system consists a centralized database hosted on the server and made available to different authorized user in different location.

National Health Insurance Scheme (NHIS) is basically, a social security system that guarantee provision of needed health service to person on the payment of token contribution at regular interval, where the insured pays cost out-of pocket and is the reimbursed by the insurer or the insurer makes payment directly to the provider, all depending on the type of health insurance coverage the individual is under. Tertiary Institution Social Health Insurance Program (TISHIP) is a program committed to ensuring access to qualitative healthcare service for students of tertiary institutions thereby promoting the health of students with a view to creating conducive learning environment.

1.1 **Statement of Problem**

At the Federal Polytechnic Ede Medical Centre, It is on record that average patient spend about 10 to 12 minutes before his medical record can be located and also average of 25 to 30 minutes before such a patient have access to the medical doctor. Also, while some doctor are busy attending to patients some may be idle waiting for the medical record of the patient to be attended to. During the visit and personal observation to the medical centre, the following problems were identified.

(i) The present system create idle time for medical personnel because they have to wait for the records of the patient before attending to such a patient

(ii) Patients wait for almost 12 minutes before their medical record is located because the records have to be searched manually

(iii) Doctors cannot access previous medical record/history of the patient that attends hospital for the first time.

The new system is posed to solve the following problems.

(i) Time Wastage: Searching for patient records take a lot of time because the records needs to be searched serially before locating the desired record which indirectly increase the patient waiting time and increase the medical personnel idle time.

(ii) Running Cost: Patient records can only be accessed by medical personnel only when the card attendants make it available

(iii) Security: Data and record stored by the hospital can easily be accessed by an unauthorised users. Manual system cannot be protected from being accessed by any user.

2.0 **Literature Review**

Ajala, Awokola and Emuoyibofarhe (2015) developed Electronic Medical Record (EMR) System For a Typical Nigerian Hospital. The system was able to generate the patient medical records and history in digital format, medical staff at record unit, pharmacy, laboratory can preview, edit and update patients records but the system can only work for a particular hospital, the database cannot be shared by another hospital of the same operation.

Ambrose (2017) blames the underdevelopment of health sector in Nigeria on inability of the sector to explore the potential of Information and Communication Technology. According to his findings, the challenges associated with the implementation of EHRs in General Hospitals in Nigeria include infrastructure issues like power supply and inadequate ICT equipment; human factors issues like inadequate computer skill among non-medical and non-clinical staff; as well as political issues such as poor administration, corruption and financial constraints. And while the participants believed that willingness of the doctors to adopt the EHR system and good knowledge of computer use among the doctors were prospects to implementing the EHR, the participants agreed that benefits such as improved access to and enhanced confidentiality and safety of patient data as well as enhanced service delivery will be derived from implementing the EHR at the hospitals where they work.

2.1 Significance of the Research

The Centralized Medical Information Management System for NHIS/TSHIP patient will provide the following benefits to the health sector

(i) Enhancing productivity of health sector by eliminating patient waiting time through automated searching of patient record
(ii) Improved medical service delivery by making available patient record and medical history at real-time through internet irrespective of the location of the patient and medical personnel
(iii) Ensuring information security of the patient medical information so that records can only be accessed by an authorized user through the use of access codes
(iv) Reducing the hospital running cost by eliminating paper work

3.0 Research Methodology

3.1 Data Collection

Primary data were collected from Polytechnic Medical Center precisely NHIS/TSHIP unit, personal observation was used for data gathering, arrival rate and service rate at the record unit were recorded and also arrival and service rate at the consulting rooms were also recorded between Monday to Friday, the recordings were taken from 8am to 4pm each day and average arrival and service rate were calculated and the following table was obtained.

Table 1: Arrival and Service rate at polytechnic medical Centre

		Record Department		**Consulting Room1**		**Consulting Room2**	
		Arrival	Service	Arrival	Service	Arrival	Service
DAY1	AVERAGE	10.83	11.50	10.66	12.00	11.00	11.16
DAY2	AVERAGE	9.33	11.33	10.00	11.00	10.16	10.00
DAY3	AVERAGE	11.33	10.33	10.50	11.51	10.33	12.83
DAY4	AVERAGE	11.00	11.16	11.33	11.50	10.50	11.00
Day5	AVERAGE	10.50	11.00	11.83	10.58	10.16	11.33
	TOTAL	52.99	55.32	54.32	56.59	52.15	55.32

3.2 System Design

Top-down was adopted for the design of the system, this involves the breaking down of program into units or modules which enables a program to be easily debugged if error occurred at any part of the program. With this error will be easily traced and debug and modules can be easily tested individually and integrated together later.

3.3 System Architecture

The architectural design of the system shows the interaction and interrelationship between the system and the users, the system store patient's medical records in the central database and the users access and update this records at any time they wish. The users log in with the code allocated during the registration, to update the patient data the hospital code or card number.

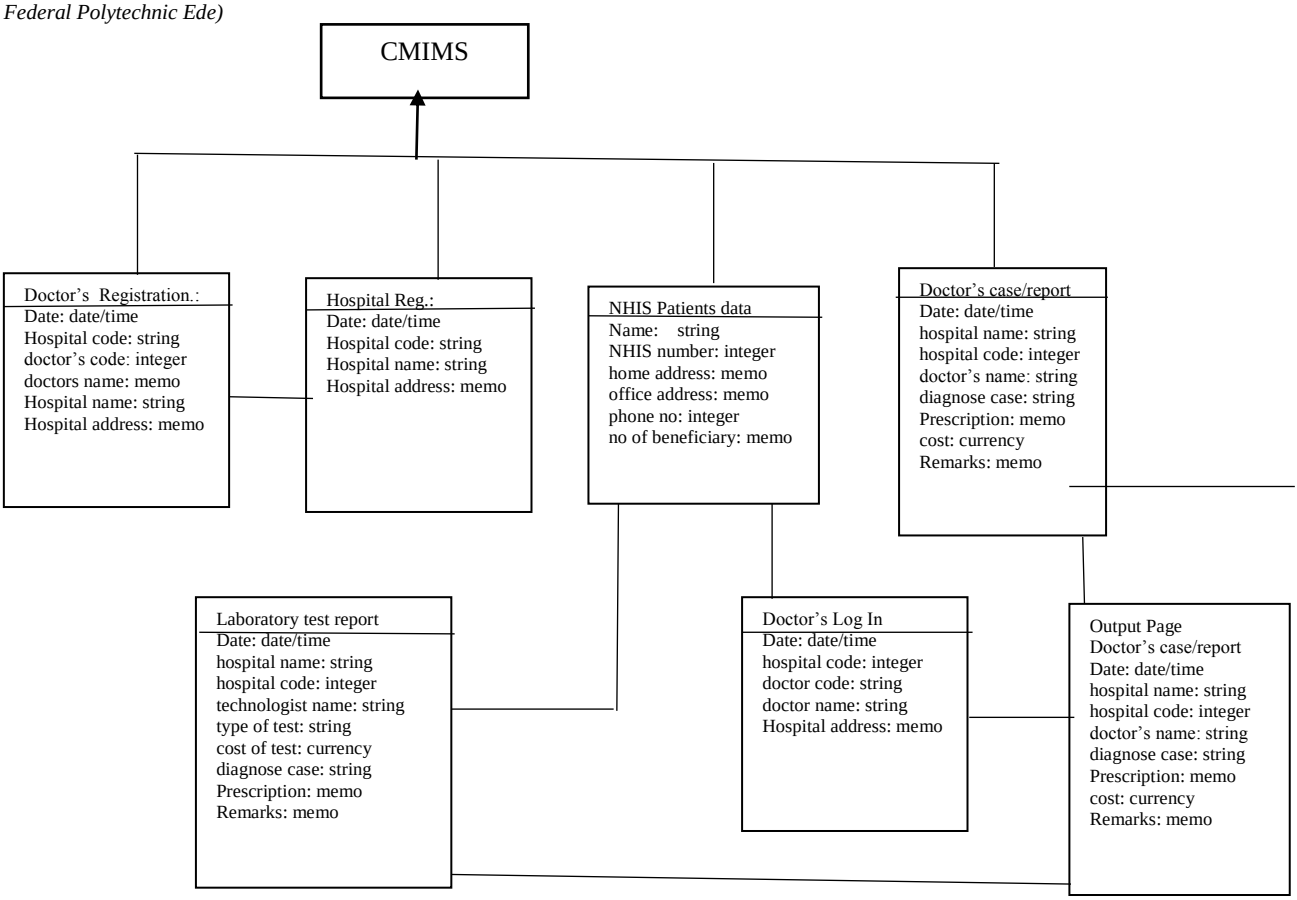

Figure 1: Class diagram for CMIMS

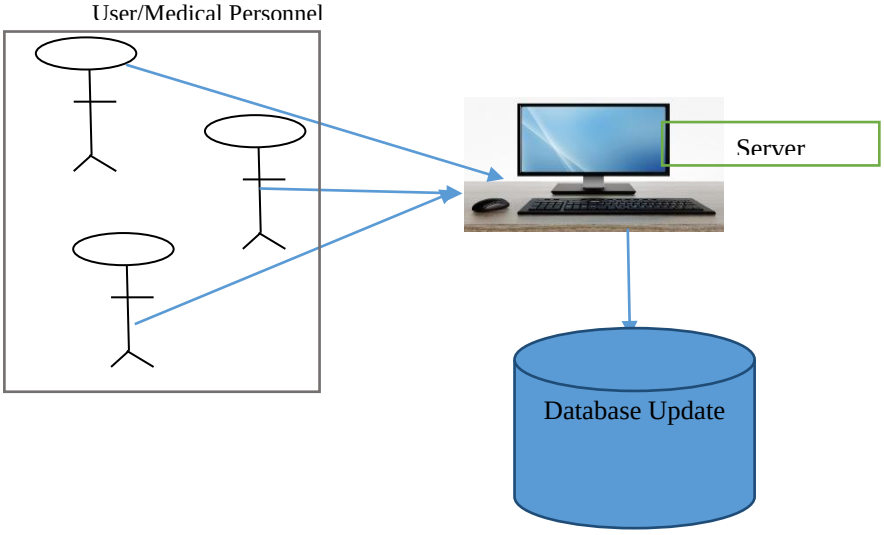

Fig. 2: Architectural design of CMIMS

4.0 **Result and Discussion**

After the successful design of the system, the system was implemented on WAMP server to test the efficiency, reliability and to compare the outputs. Some of the outputs produce by the system are shown below:

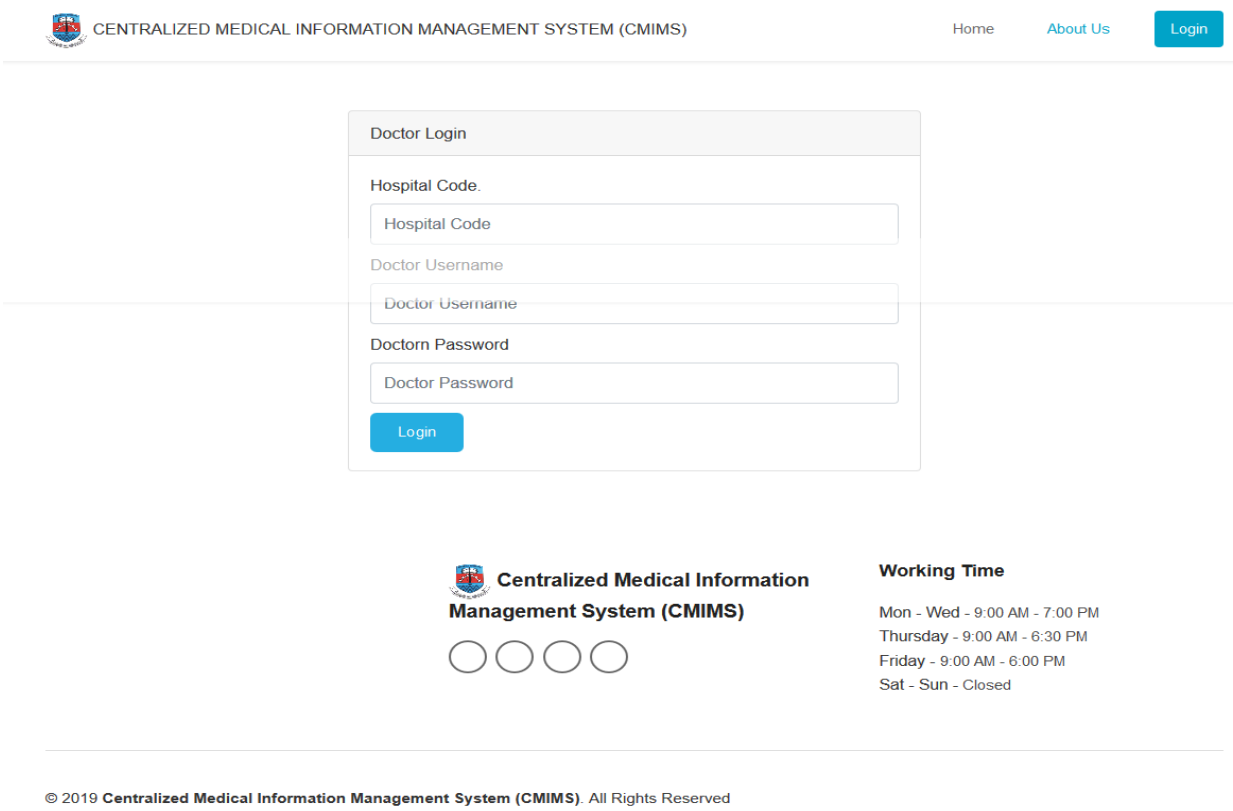

Figure 3: Doctor Login Page

Figure 4: Hospital Registration

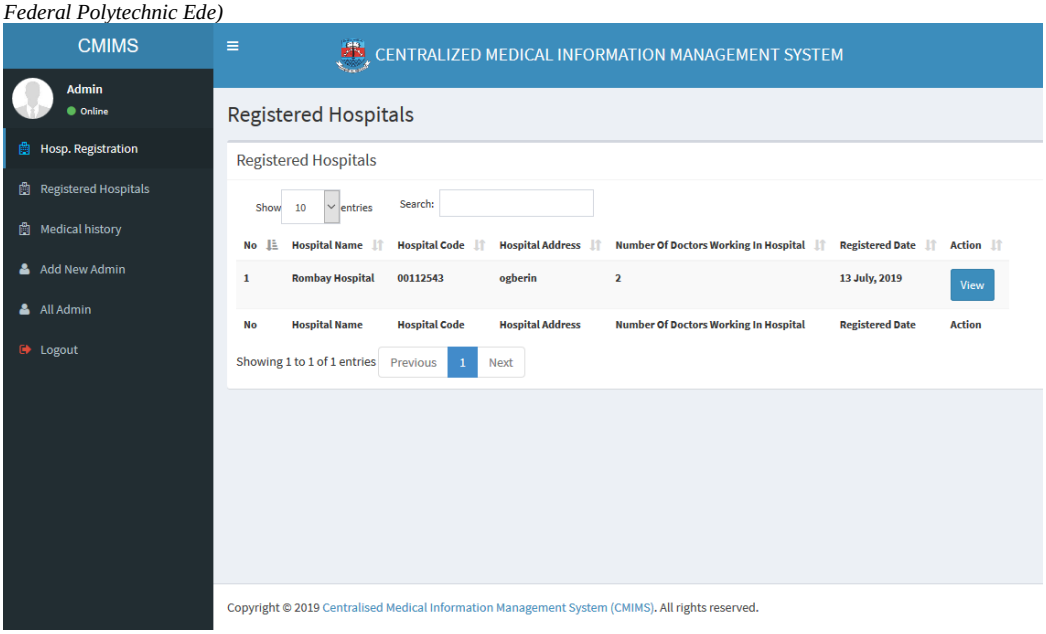

Figure 5: Patients Record

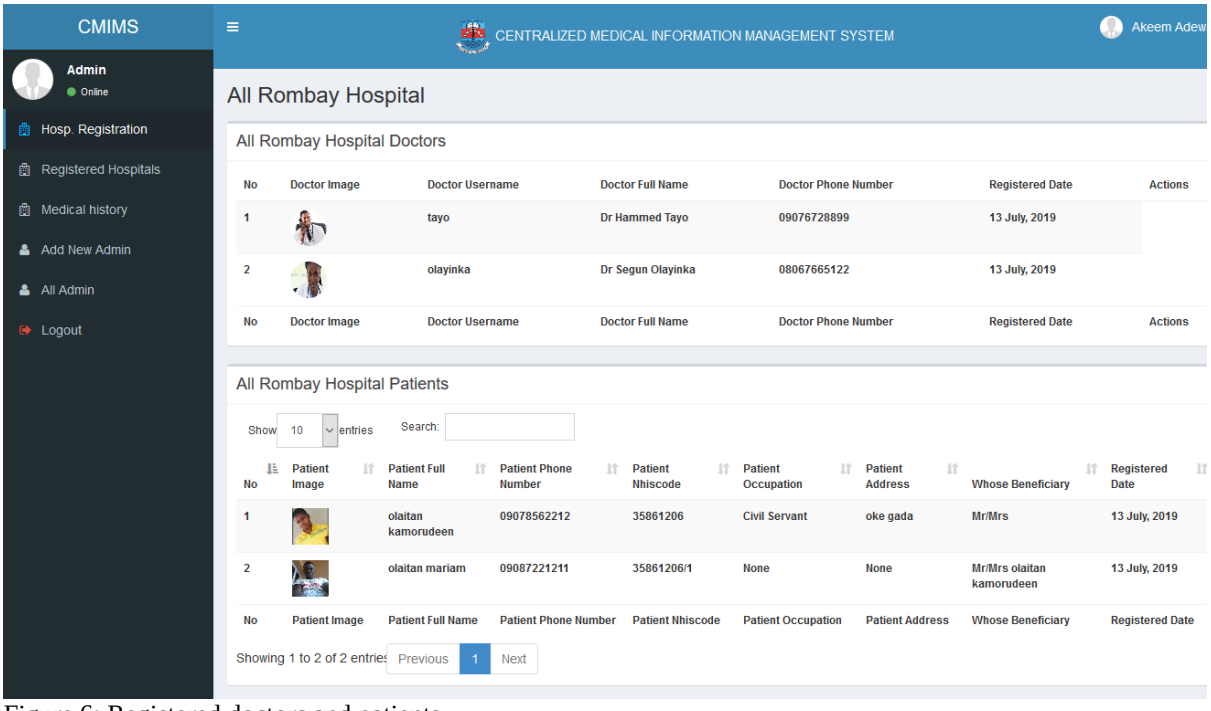

Figure 6: Registered doctors and patients

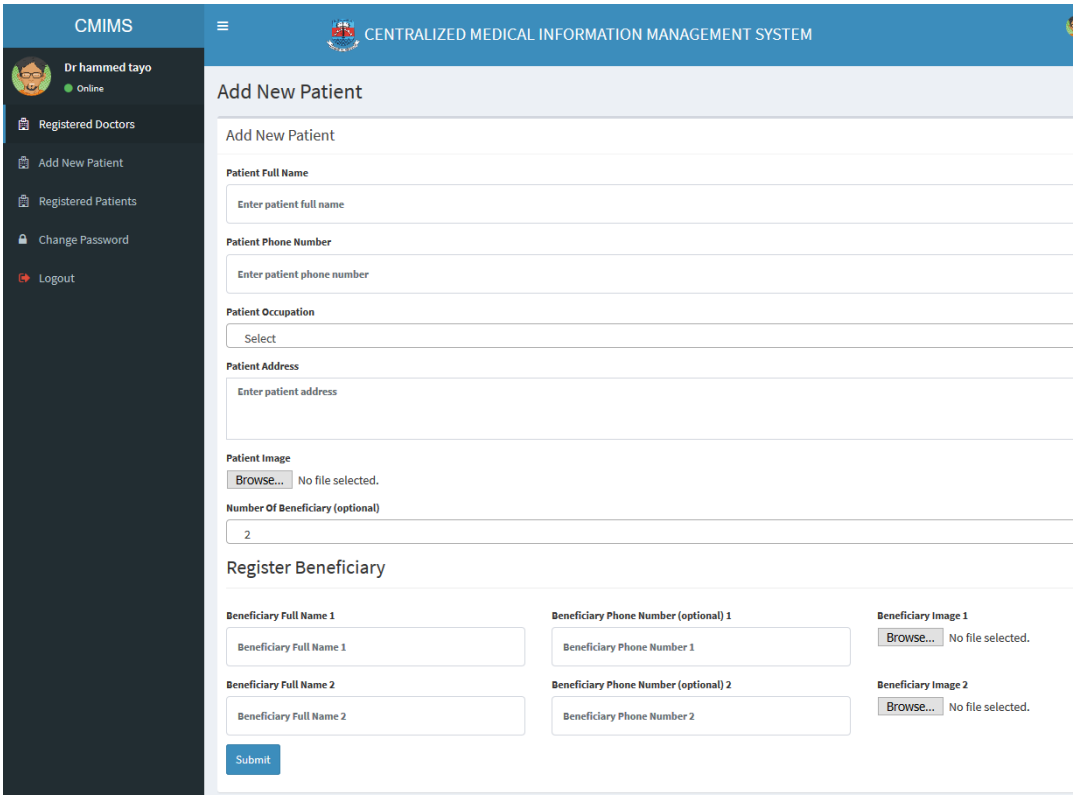

Figure 7: Capture New NHIS/TSHIP patient

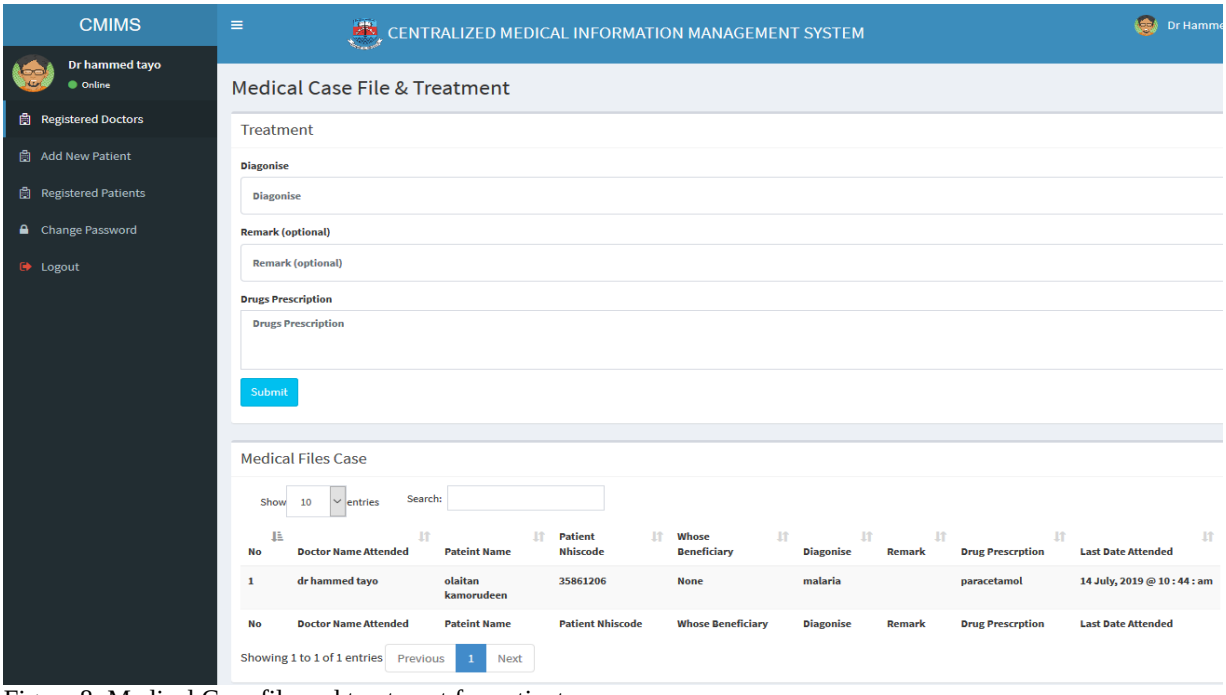

Figure 8: Medical Case file and treatment for patient

5.0 Conclusion and Recommendation

This research automate the hospital patient record and management of patient data history, it radically eliminate the waiting time at record unit and simplify the work of medical doctors, laboratory technologist and other medical personnel working directly or indirectly on patient medical record. The system was implemented using WAMP server. Given the constant increase in the development of Information and Communication Technology (ICT) in every sector of our economy, there arises a need to continue to harness both as tools for delivering qualitative and secured healthcare services. Hence the following recommendations are made

(i) Government should ensure that all the hospital registered under NHIS should be well equipped with state of the earth Information Technology devices

(ii) Health workers should be well trained on handling and use of Information Technology devices to ease the daily work and improve the quality of health services

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