

# A Framework for Health Management System for Tropical Diseases in Nigeria.

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**Abstract**— This project is a Health Management System for Tropical Diseases in Nigeria. It is aimed at developing a health management system that collects information on tropical diseases in Nigeria. The system is designed in such a way that information is generated from each patient that visits the hospital electronically over time. The system is also capable of querying the data base for some selected tropical diseases that are mostly common from health records of each state of the country. It adheres strictly to information privacy policies with respect to patient information. The major objective of this research is to use the information generated for medical research, planning for preventive and curative care, assist donor agencies to plan medical aid for the country and it can also be used for planning national health budget. The Health Management System is a web application developed using PHP, CSS and MYSQL as database. Object Oriented Analysis and Design Methodology (OOADM) were used to analyze the system and Unified modeling language (UML) is used to model the software. After a successful testing and implementation of the system with patient's data generated from five health facilities, the result of the test meets the objective of this study. The system will be useful for keeping patient health record, diagnosis, prescription and to view tropical diseases online for research purposes.

**Keywords**— Health Management System, Tropical Diseases, Information System, Medical Research, Patient Record.

## 1. INTRODUCTION

Healthcare is an information intensive industry and healthcare professionals rely on access to correct and comprehensive information, when and where they need it, to inform the daily decisions they make about a person's care. Information and communications technology is largely absent from the way we generate, capture and share health information as we continue our reliance on handwritten paper records. To say that this reliance on paper is inefficient, wastes money and scarce resources, and compromises patient safety and the quality of care is an understatement [1].

According to Professor Odusanya who spoke on: "Improving Healthcare Service Delivery in Nigeria". The time has indeed come in the country to reconsider the content of healthcare services and make it more accessible and continuous. Nigeria at this time needs a health system that would reduce the number of people dying and as such, it is time that corruption must be done away with and not found in the system at any level of care [2].

Information and communication technologies, ICT is used to describe a range of technologies for gathering, storing, retrieving, processing, analyzing, and transmitting information. Information is seen as a key element to achieving these objectives, as is a workforce trained in the appropriate health information skills [3]. It is an unfortunate reality that healthcare is not as safe as it should be. Adverse events and preventable errors that cause patient harm and death are common place in healthcare. These errors are most often not the fault of individuals, but of a system that fails to provide safe and effective care. The cause of preventable errors can be traced to gaps in the flow of information and communication failures both

within organizations and across different healthcare service providers. The personal cost of these errors is immeasurable. ICT has helped in bridging distances and providing access to clinical knowledge, specialized expertise and health services thus saving lives and costs. The need for reform of health sector and the need for investment in, and deployment of e-health has been part of the healthcare agenda for many years [4]. These well documented challenges include rising demand for healthcare services due to the ageing of the population, the rise in chronic disease and increased consumer expectations; problems with health workforce supply and distribution; inequity of access to services, particularly amongst indigenous, rural and poor populations; quality and safety concerns; and fragmented and limited ability to share information [1].

In order to meet these challenges and ensure enhancement of existing health care systems, deployment of health informatics/e-Health and interoperability among health service providers cannot be overemphasized.

## 2. Significance of the Study

It helps in having quick Access to some tropical diseases across Nigeria, for medical research and health planning; It helps to identify regions or communities mostly affected by some tropical diseases in Nigeria thereby attracting the attention of government or nongovernmental organization to their aid; it gives the Government a focus on Health strategic plan.; It enhances the need for prevention and treatment of the affected person in the regions/communities; Since tropical diseases are associated with poverty, poor sanitation etc, this study will help the government to identify areas for poverty alleviation programme and the need to improve environmental sanitation in the affected areas.

### 3. LITERATURE REVIEW

#### 3.1 Information Systems (In The Internet Age)

[5] Stated that Internet computing is changing the nature and scope of information systems (IS). Most IS methods and techniques were invented before the advent of the Internet. He reviewed the world of information system in terms of processes and products, qualities, social structures, and the role of automation. Given the rapid adoption of Internet thinking not only among technical professionals, but in the public consciousness, he outlined the prospects and challenges for information systems in the emerging landscape. In particular, he highlights the need for richer modeling abstractions to support the diversity of services and modes of operation in the new age of world-wide open network information systems.

#### 3.2 Organization and Management of Health Services in Nigeria

[6] in his study documented the evolution of the "Organization and Management of Health Services in Nigeria since Independence in 1960". The study investigated the strategies devised by the various successive Nigeria governments in the organization and management of health services since Nigeria gained independence in 1960 to 2004. The purpose of the study was to explore the question, whether the outcome of health services in Nigeria are management bound or not. The study was conducted at the Federal Ministry of Health, Abuja, Nigeria. Content analysis of official reports and related literature, questionnaire, individual interviews and group discussions were employed to complement the survey data. Frequency distribution was used for data analysis. The main assumption or hypothesis of the study is that Management services if effectively institutionalized in the health sector will enhance optimal performance and is capable of producing the desired health outcomes of the country.

#### 3.3 Development of a Formal Framework for Usable Operations Support in E-Health Based System

The automated e-Health-based system was designed to eliminate clumsy and tedious treatment procedures associated with manual treatment processes prevalent in care centers, especially in the developing countries [7]. In his work, he uses algebraic specifications in object constraint language (OCL) and Unified Modeling Language (UML) in the analysis and design of some subsystems in an e-Health based system. Wireless Markup Language (WML) and Java programming language were used to developed the operations support functionally with real-time access to medical information via hand-held devices. The study revealed that 92% of the medical professionals who evaluated the application would like to see it deployed for use in medical centers in order to enhance health care delivery.

### 4. Propose System Procedure

The proposed system is a web application. The application is used by hospital, health centers, researchers, non-governmental organizations (NGO's), and managers for health management, health promotion and diseases surveillance.

Considering the constrain and limitation of the existing system, the proposed system seeks to address some inherent problems identified in the traditional paper record system. This is with the aim of providing an effective electronic health record system and to make available on the internet some tropical diseases which are commonly found in Nigeria for medical research and health planning. Figure 4.1 shows the logical view of the architecture for implementing the system. The architecture shows various logical flows at every module in the system.

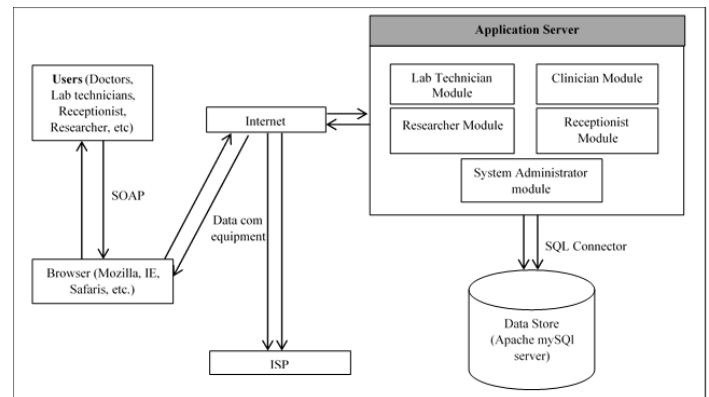


Figure 1: Implementation Architecture of the proposed system

#### 4.1 Use case diagram

Use case diagrams are used to gather the requirements of a system including internal and external influences. Figure 3.1 is a use case diagram of the system that shows the role of each stakeholder represented in the use case diagram

- i. Clinician: the clinician takes medical history of patients, perform clinical tests such as Blood Pressure (BP), body temperature, Respiration etc., diagnose and treat patient base on clinical findings and lab results, refer special cases to the specialist. He can view Hospital record and online disease record.
- ii. Lab Technician: Read lab request of the clinician on a patient, perform lab test, send result to the clinician and can view Hospital record.
- iii. System administrator: Enable or deny asses to users, update records, view hospital and online record.
- iv. Receptionist: Register patient and book consultation.
- v. Researchers: View online disease records for research purposes.

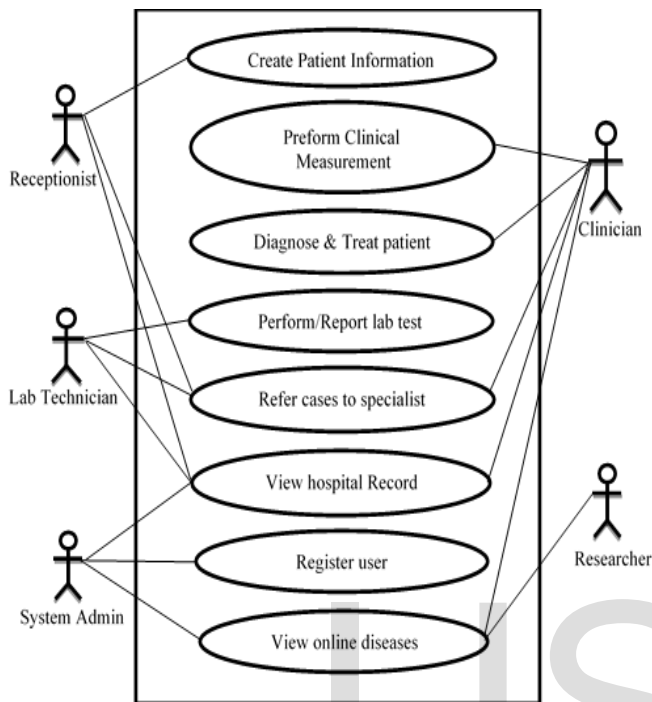


Figure 2: Use Case Diagram of the System

### 5. System Implementation

The application front end is designed using PHP and MySQL Server serves as the database. To run the application, the user will install a browser (Google Chrome, Internet Explorer, Mozilla, opera, etc.) and Apache for the MySQL database then following steps will be taken

- i. Open the installed browser and the url <http://127.0.0.1/RBHCISTD/> to load the home page
- ii. Login with the necessary login details example (admin or User) if an old user.

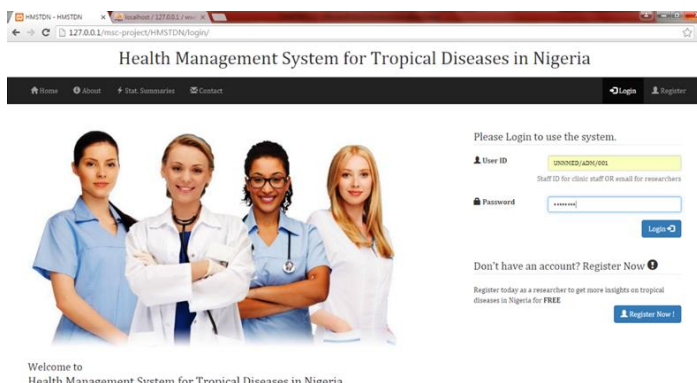


Figure 3. Home Page of the System

To add a staff, click on staff and select staff category

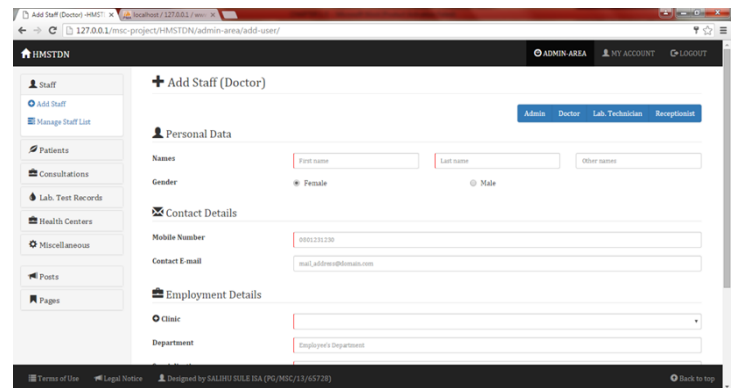


Figure 4. Add Staff Record

Add patient, create consultation and add lab record by clicking on any of the link selected.

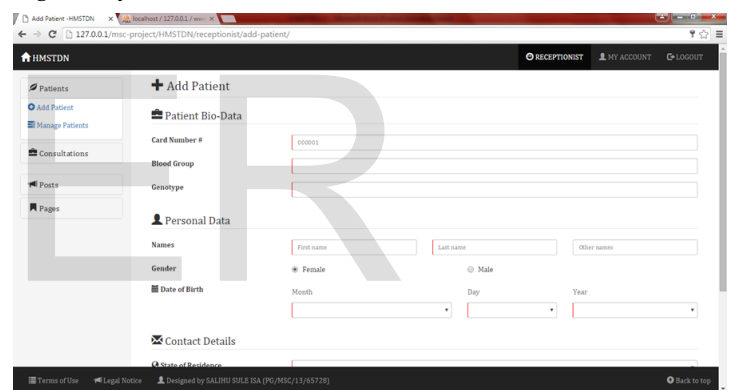


Figure 5. Add Patience Record

On the home page click on Stat Summaries to view the summary of each prevailing tropical diseases.

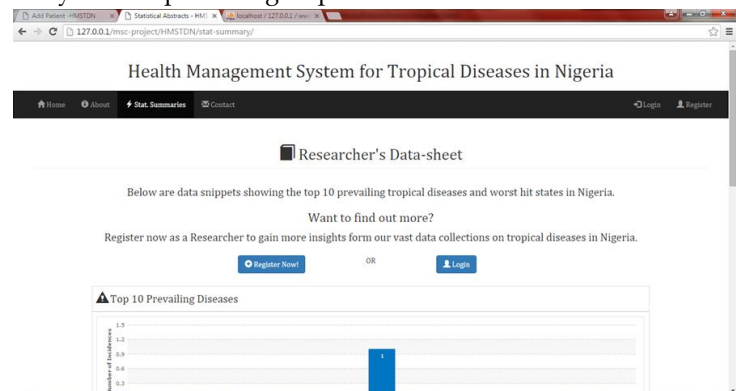


Figure 6. Research data sheet showing the top 10 prevailing diseases

For research purposes, data generated from the site can be filter, based on the type of diseases and the period of infection.

Click on Statistic Summaries to filter and view the summary of each prevailing tropical diseases.

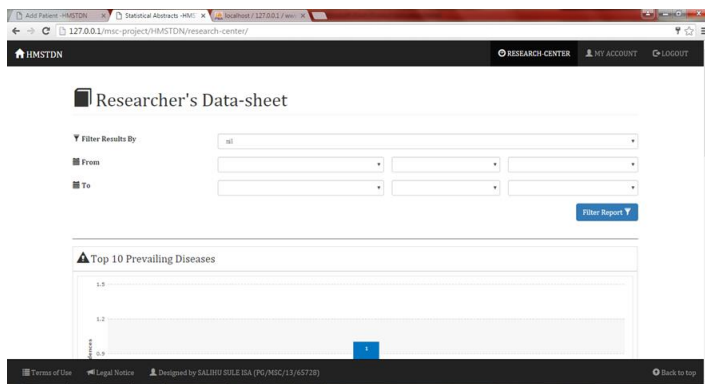


Figure 7. Filter disease result page

## 6. Conclusion

The Nigerian health care system is poorly developed and has suffered several backdrops, especially when it has to do with tropical disease management. This application serves as a framework that will enable hospitals and other organizations to effectively monitor Tropical disease records without ambiguity; this work has succeeded in demonstrating the practicality of deploying usable Health Management System that makes available real time information of tropical diseases in Nigeria on the internet. The system is recommended for use in hospitals and clinics for medical health records keeping, because it brings professionalism into the profession, saves time, reliable, and more efficient. In addition to managing records, Researchers, nongovernment organizations, volunteers, government etc. can also use the information provided on the internet as a benchmark for research and Health planning. Finally, the adoption of the product of this research work when deployed in health care centers offers a good contribution for the country to meet up with some of the challenges curtailing the proper management of tropical diseases by providing an effective IT-based support for care givers.

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