An Enhanced Patient Medical Information System

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ABSTRACT

Health records are stored in a medical information system, which affects all parties engaged in the delivery, receipt and payment of healthcare. To better serve people living with HIV and other infectious diseases, the Louisiana Office of Public Health, the Louisiana State University Health Services Division, and Louisiana Public Health Institute worked together to expand the functionality of the LaPHIE system already in use. Object-oriented system was implemented. Web-based graphical user interface for HIV/AIDS patients is the study's primary goal; the graphical user interface will be linked to the medical database and the upgraded patient health record (PHR) management system will be implemented utilizing PHP, MySQL, JAVA Script, and HTML5. Patients' medical records, availability and efficiency in information processing as it applies to medical history, scheduling visits, updating medical results, and paying hospital bills and prescriptions are all examined in this research. During physical health assessments, patients and caregivers will particularly benefit from this research (PHEs). For treatment, 52% of patients expressed an interest, but just 11% expressed an interest in test findings. Treatment outcomes were 82% in the improve system, and lab results were obtained by 49% of patients. It is highly suggested that healthcare institutions use the improved patient health record (PHR) management system in order to establish an effective health record between caregivers and patients. In contrast to the enhanced patient health record (PHR) management system, which considers patient health record access efficiency, the LaPHIE system meets its intended purpose but is not patient friendly.

Keywords

Patient, Health record management, Health service delivery.

1. INTRODUCTION

From a paper-based to a digital-based system, medical records storage and dissemination have evolved over time[1, 2]. Health facilities have benefited greatly from advances in digital technology that have made it easier to collect and share electronic medical records from patients across a wide range of healthcare providers[3]. A patient's symptoms, complaints, and treatment can be recorded in the simplest form by a single healthcare professional, and the data can be aggregated, integrated, and harmonized to promote collaboration among healthcare providers, researchers, and administrators[4].

Patient medical record that includes information from several doctors, labs, clinics, hospitals, and treatment facilities now provide a comprehensive picture of a patient's health history as well as valuable data that may be used to improve treatment and outcomes[5]. There have been many advancements in human technology since the days of prehistoric civilizations, and new methods are being invented all the time as a result. Medical records are the only thing that proves that a treatment or operation was attempted. An ever-expanding number of organizations are now involved in providing healthcare services. Specialists such as dietitians, social workers (counsellors), and physiotherapists are frequently included in prevention-focused healthcare plans, in addition to non-clinical services like these. There are many different types of entities that are involved in the delivery of healthcare services. It's important to note that care-specific entities include the patients themselves as well as the doctors and nurses who treat them. It's possible for multiple parties to access the databases that hold the information[6].

Billing services, insurance firms, and pharmaceutical corporations, for example, rely on health data in their work even when they aren't directly involved in treatment delivery. Patients must be informed of the additional use of their medical information for specific purposes, including medical research and administration. Such information may or may not require consent or anonymization, which is governed by the Health Insurance Portability and Portability Act (HIPPA), which stipulates that patient must be informed of the additional use of their medical information for specific purposes, including medical research and administration (e.g., use statistics) [7]. We cannot have a good health care system without good data. Health care systems generate and disseminate data. In healthcare, consultation and collaboration are widespread and often required for patient care, and information sharing is essential.

Professionals now have better access to data thanks to technological advances. Over time, there is a lopsided sharing mechanism and an environment in which the health information of an individual can move effortlessly across systems utilized by authorized health professionals, carers, and the patient; when there is an allowed sharing. Health information systems can assist patients, their care givers, and their health care providers, but more specificity is needed to understand how they can do this. A patient's medical record is only accessible to other patients at the same health facility where it was originally created. The Health Insurance Portability and Accountability Act (HIPPA) mandates that patients have access to their medical records and can make changes to them. There are several drawbacks to the usage of electronic mail (email) systems in modern medical facilities, such as the fact that it is more or less a static form of access to an individual's medical data. Patients should be kept up to date and have access to all of their medical records, regardless of where they have been treated.

Confidentiality, integrity, access control, portability, efficiency of information retrieval between locations, and user experience as it pertains to the payment of hospital bills, real-time updates of health information, and the patient and caregiver relationship are the main obstacles to the adoption of digital medical records.

Medical Appointment Scheduling and Billing: In order to verify payment and schedule medical visits, patients must always appear in person before a healthcare institution account officer. Most patients with serious health challenges are unable to complete this transaction on their own, thus they need the help of others to expedite the process.

Real Time Update of Health Record: As a result of the lack of real-time updates to the patient's electronic medical record (EMR), vital health information such as vaccination and lab results are unavailable. Consequently, people are unable to provide regular updates to healthcare providers on their health status and lack access to a complete medical history. Even while the patient-stored information becomes antiquated over time, the delivery of health care is rendered obsolete when there is a proper channel for patients to communicate updates about health challenges caused by medications, for example, allergies

Patient and Caregiver Relationship: There is a lack of communication between health care facilities and third-party providers regarding patient health records. Caregivers, such as those caring for small children, elderly parents, and speech and hearing-impaired adults need to be able to track and update their health records so that they can better coordinate care.

The study's goal is to create a better system for managing patient health records (PHRs) so that patients have better access to their records.The study's objectives are to:i.) design web-based graphical user interfaces for patients and a patient health database that is linked to the patient Web-based graphical user interface. ii.) implement the design in I using PHP, MySQL, Java Scripts, HTML5 and Cascading Style Sheets (CSS) and, iii.) compare the improved system to the existing one.During physical health assessments, patients and caregivers will particularly benefit from this research (PHEs):

Vulnerable and Special Populations: For vulnerable and special populations, such as those who are deaf and mute, caregivers already have information they need to assist them.

Children and Elderlies: In order to aid caretakers in identifying critical information, such as medical issues and medicine allergies, the system makes available health information pertaining to children and the elderly through its online database.

Reduces Population Turnaround: Patients are less likely to need visit a healthcare institution because all of the information they need is already in the system, resulting in a smaller patient population.

The study covers patient medical record authorization, access control, health records availability and efficiency in information processing as it pertains to:i.) medical history, ii.) booking of medical appointments (check-ups), iii.) update of medical results (lab, scan, and test docs), iv.) hospital bill payment and, v.) medical prescription.

2. LITERATURE REVIEW

The term "health information system" has been defined in a variety of ways. A healthcare organization's information system can be viewed as a type of information system[8,9,10]. Even such, the term "information system" does not always imply any technological characteristics. Perhaps it's a matter of how useful information is processed, managed, and disseminated. In the healthcare industry, the term "health information system" refers to a set of processes for acquiring, storing, analysing, and making use of data. Organizations such as regional or national healthcare organizations may have access to this system, which can be owned by any one of these groups [11]. [12] published a report in which they discussed the breadth and utility of electronic health records in the United States. In order to enable patient-centred treatment, self-management, and efficient use of "HealthDesign"

healthcare system resources, this is a significant and generally recognized innovation in health information technology." The program has attempted to solve some of the issues, but there are non-trivial technological and policy issues, including efficient ways to allow patients to manage privacy and access rights, ensure data integration from multiple sources, including patients, and create a secure data sharing agreement between established health care agencies and data integrators from third parties. For the self-management of diabetic patients, a web-based Personal Health Assistant (PHA) was developed and tested [13,14]. In spite of the fact that this is only a prototype and a first test version, no new inputs have been entered or pattern changes have been recognized in order to uncover the health history of the user. [15]unanimously agreed that in a world without a cure, it would at least prefer an atmosphere in which they could strengthen their relationship with their provider and greater resources to track this condition, a thorough examination of "MY MediHealth-Designing a Next Generation Framework for Child-Central Medication Management". Using a conversational model developed by [16], situations as diverse as logistics for transportation and disaster relief to increasing medication compliance and conducting collaborative online research and execution of new tasks were all put into practice. The safety of patient data is a constant concern despite their usually enthusiastic outlook on self-care solutions that use sophisticated technology. Because of this, there is a low level of acceptance of the new technology. It is the belief of the auto-care dream that patients own and share their data in an educated manner that underpins this vision. As a strong data collecting and integration tool, human interaction has significant ethical and legal, societal and technological hurdles to overcome[17]. Personal initiatives to create an eHealth environment have resulted in more and more efforts to exchange information utilizing shared databases outside of normal institutional boundaries, as shown by review. Computerization in healthcare impacts clinical encounters and upsets the power balance during consultations; the PCEHR was intended to facilitate communication between the patient and all health care professionals who are interested in their treatment and have access to all health information. The PCEHR is a national EHR built from the ground up in a distributed environment where the control and control mechanisms differ from the control and control mechanisms in centralized systems. LaPHIE, a modern and secure interchange of bi-directional information about public health that connects state data on public health monitoring with electronic medical records[18], is the initiative that is most closely related to this study. Using the LaPHIE system, health care providers can be alerted when a patient has been without HIV/AIDS treatment for more than a year and has been seen in an outpatient clinic or in a distribution centre with advanced technology. Both institutions have already made good use of IT services in the context of the Louisiana Public Health Information Exchange (LaPHIE). Public Health Office (OPH) data on infectious illness cases are tracked by numerous databases. Louisiana State University had an established EMR system (LSU). Every office had the necessary technology and processes in place to securely communicate with each other. A web-based platform is being developed as part of the proposed upgraded patient medical information system in order to give anyone interested in the patient's health record direct access.
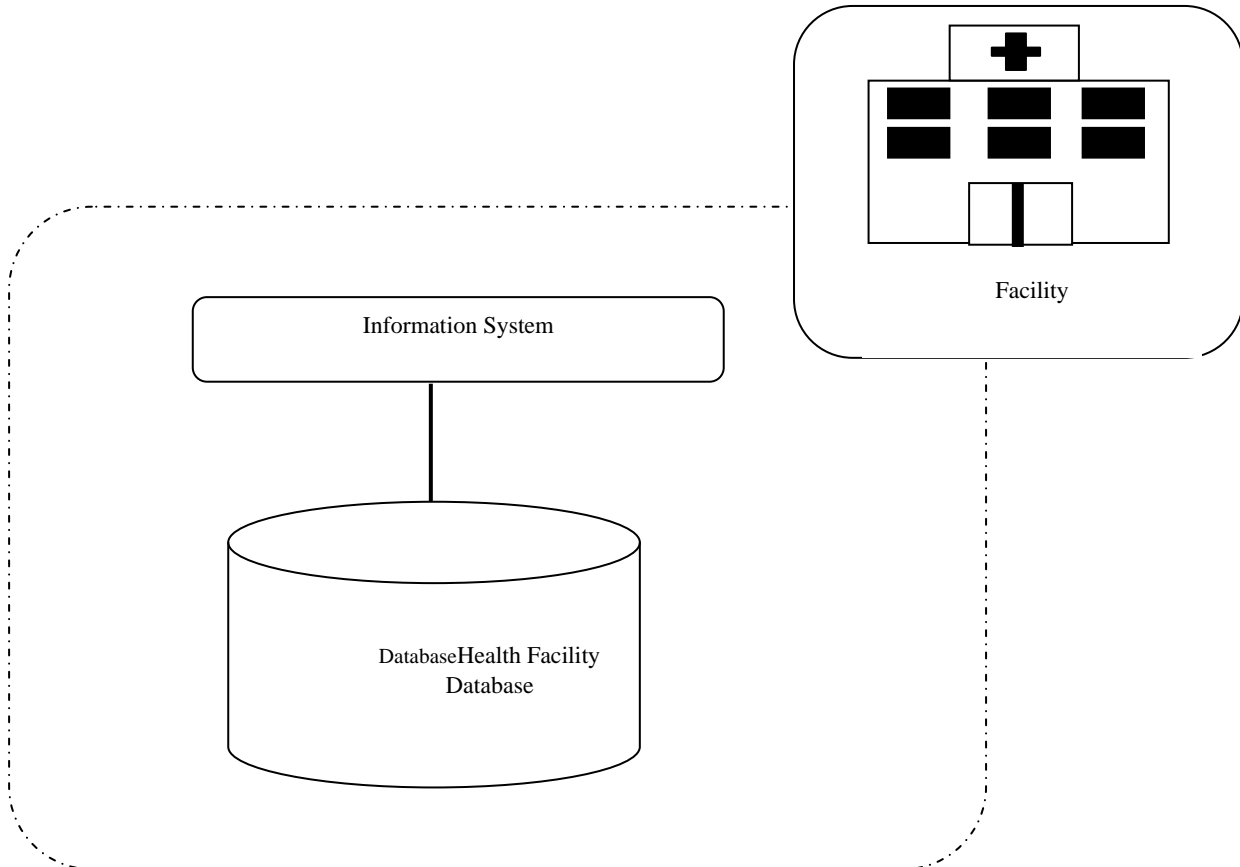
3. EXISTING SYSTEM ARCHITECTURE

Figure 3.1 is the architecture of the existing system

Figure 3.1: Existing System Architecture. (Source: Jane et al., 2012)

4. ARCHITECTURE OF ENHANCED SYSTEM
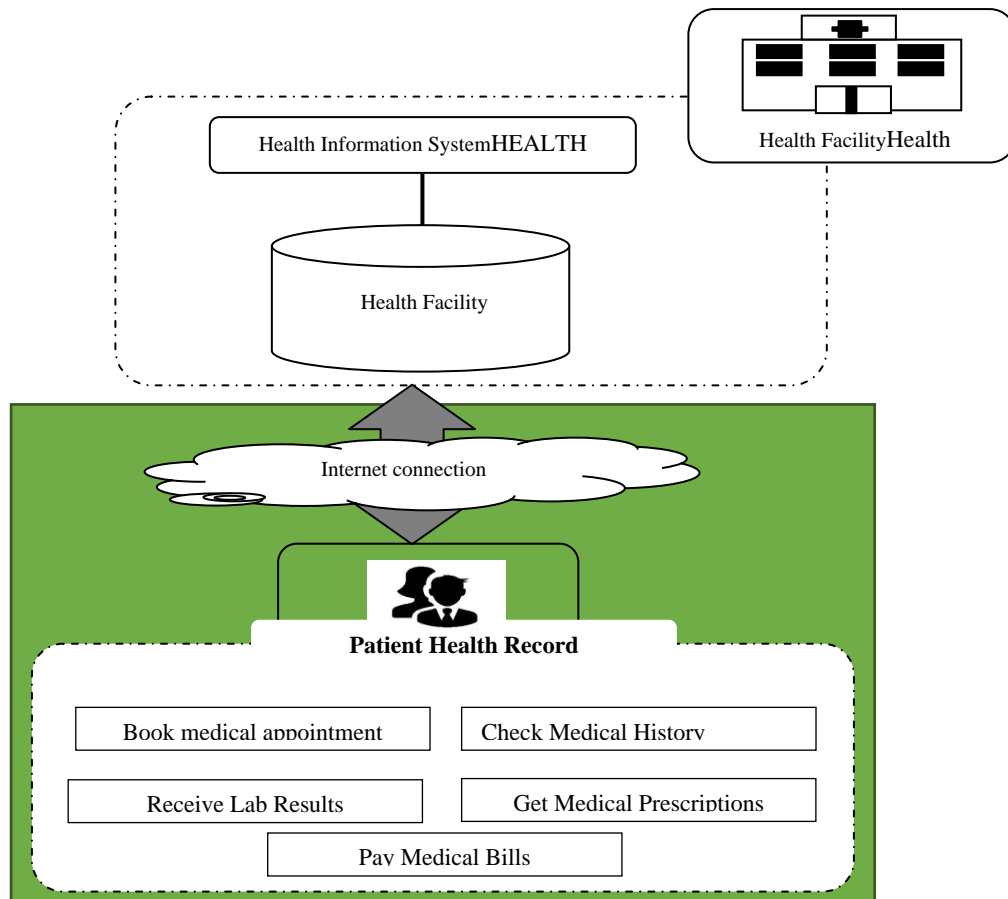Figure 4.1 is the architecture of the enhanced system

Figure 4.1: Architecture of Enhanced System

4.1 Administrative Use
Admin Login

For new registration or updating of patient health information; only staff with administrative access can login into the facility portal of the system as seen in Figure 4.1. The website is accessed via any internet connected device available for use.
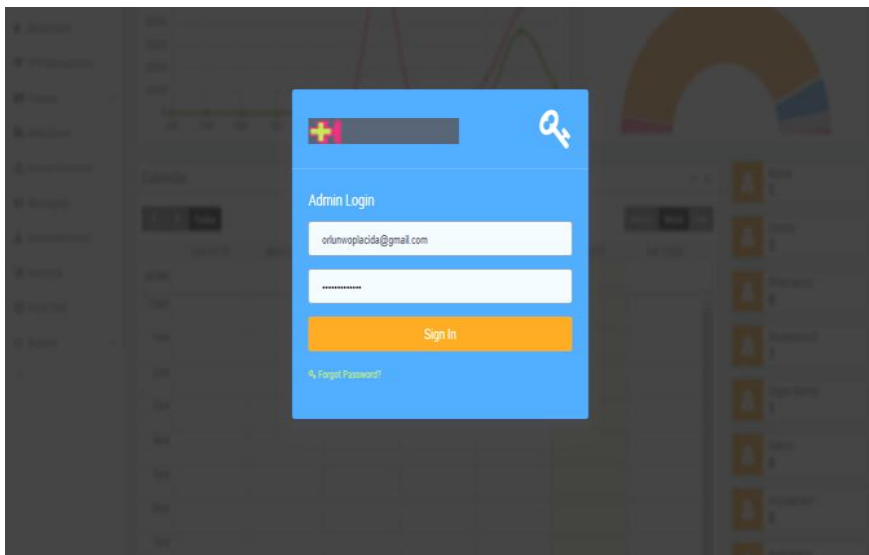
Figure 4.2: Admin login page

Add and Edit Patient Record

On logon into the system Figure 4.2, there are available optional activities personnel with administrative access can carry as privileged.On the occation of a patient registration the "In Patient Department (IPD)" option is used; this openes up a page with another option "Add Patient" and "Discharged Patient" to choose from. The "Add Patient" Option button takes user to add patient form Figure 4.3for proper registration of patient.
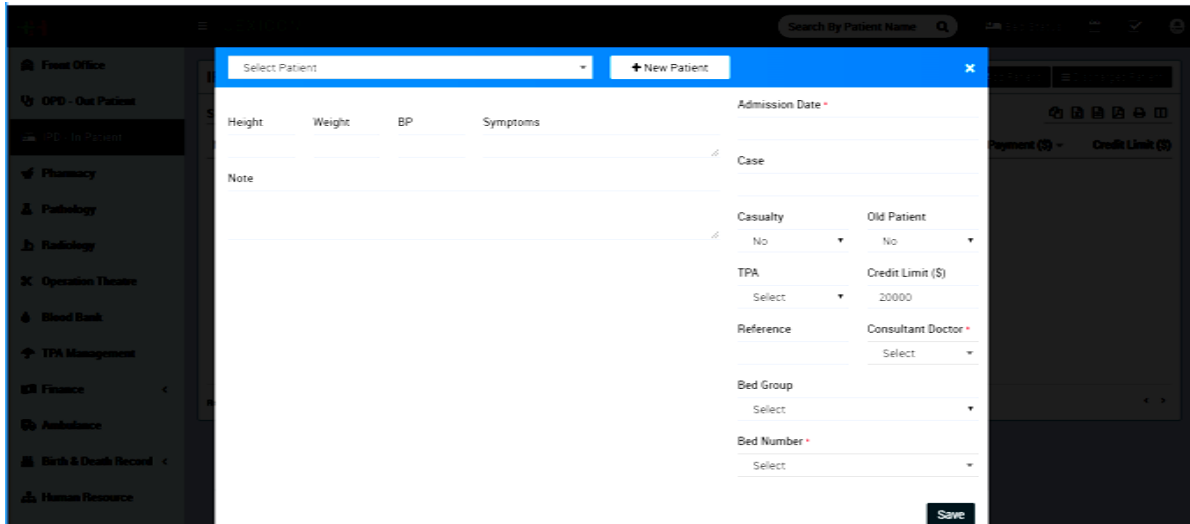
Figure 4.3: Add Patient Form

Patient Use

Figure 4.3 new patient-use section is a sculptured right for patients to access all the information contained in the electronic health record. It is a database that patients who have been enrolled correctly on this network can use and, in this case, has a special username and password that is provided by the EHR administrator without them requiring access to the site. This is also important to prevent information misuse and to provide patient information protection from unauthorized access.

Patient Login: Patients login with provided secured credentials from any mobile device with internet to access their Personal Health Record (PHR).
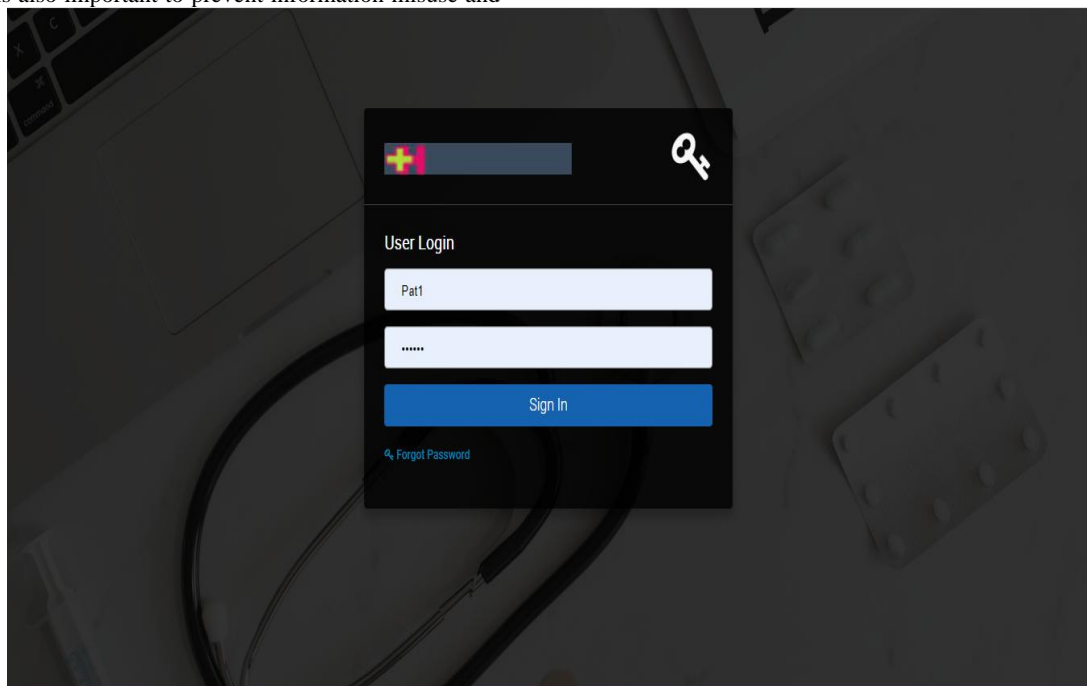

Figure 4.4: Patient Login Page

Patient Login

The portal is the goal of enhancing the existing system, this displays patient's records and health activities Figure 4.4so, far conducted in different departments of the health facility.
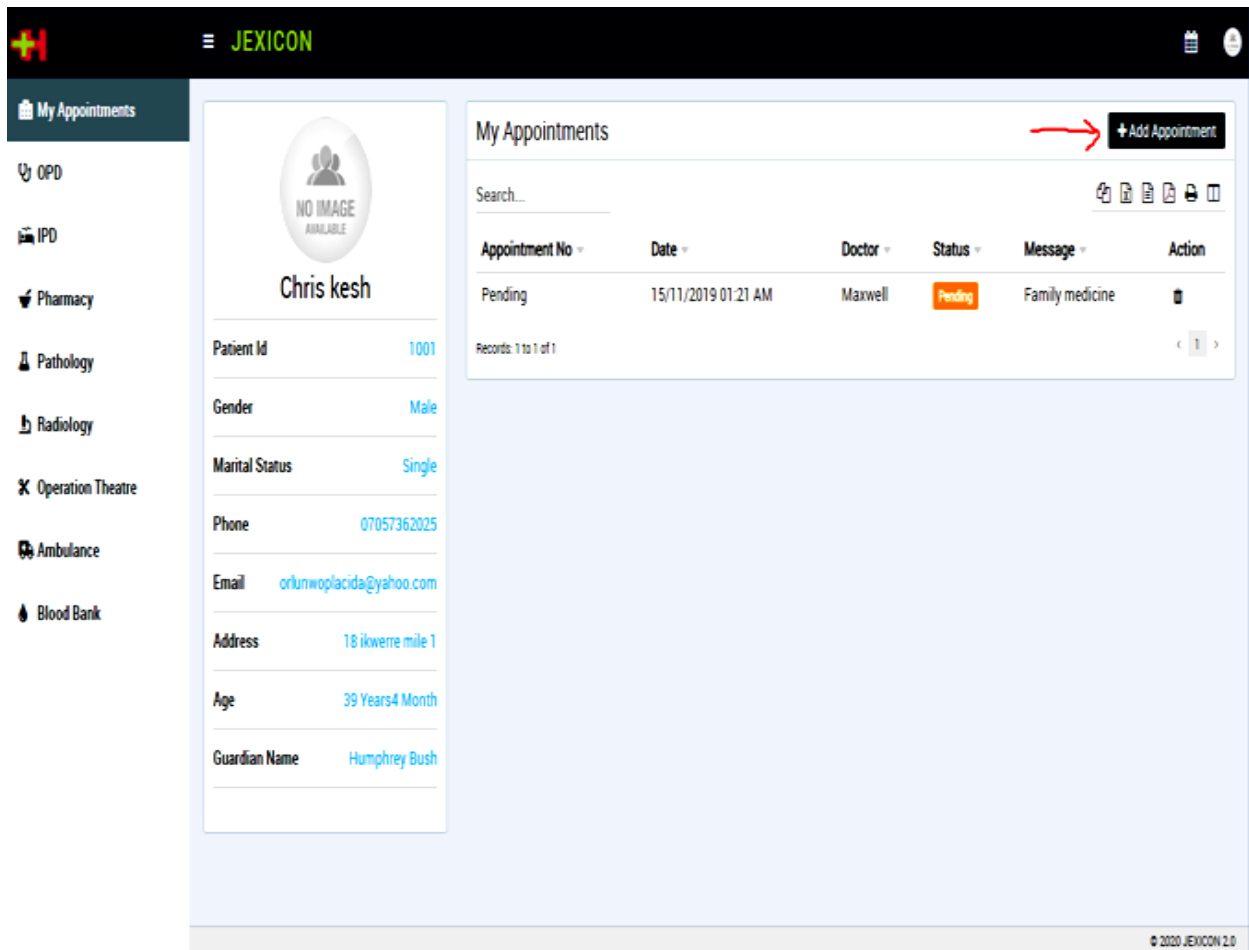
Figure 4.5:PatientRecord

The login authentication provides permission for updating, browsing, uploading, if necessary, and adding a date. Furthermore, patients can obtain automatic pharmacy reminders of their prescription from this site.

Add Appointment: The concept of "Add Appointment" option in Figure 4.5 is an existing one that is only accessed by staff, this concept has been harnessed for patients to take control of seeking for appointment at convince.
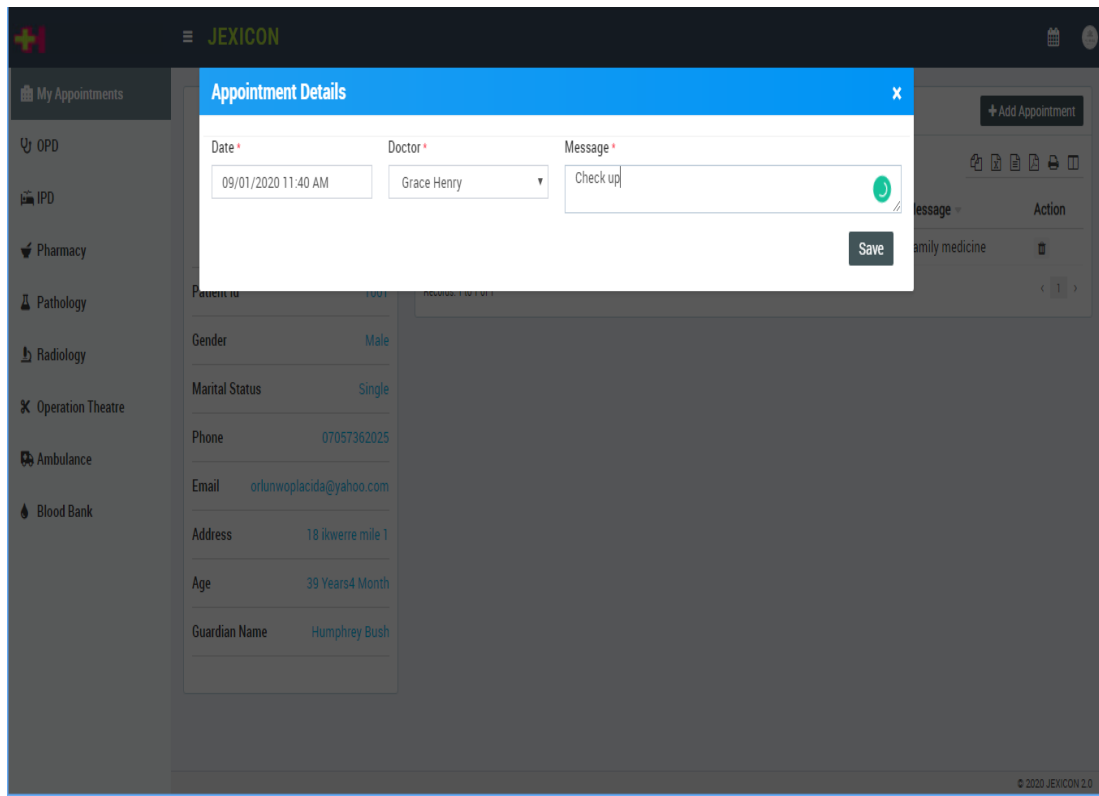
Figure 4.6: Patient Appointment Request Interface

Figure 4.6opens the appointment scheduling form if patients
press the Add appointment choice button. Patient health
record stored is accessed without visiting to the health facility.

Figure 4.7: Patient Appointment List

5. DISCUSSION OF RESULT

There is a growing interest in healthcare and public health in light of LaPHIE's new approach and early accomplishments.

LaPHIE and similar initiatives are still being used by many of the original LaPHIE collaborators to find new approaches to improve public health in Louisiana and elsewhere.
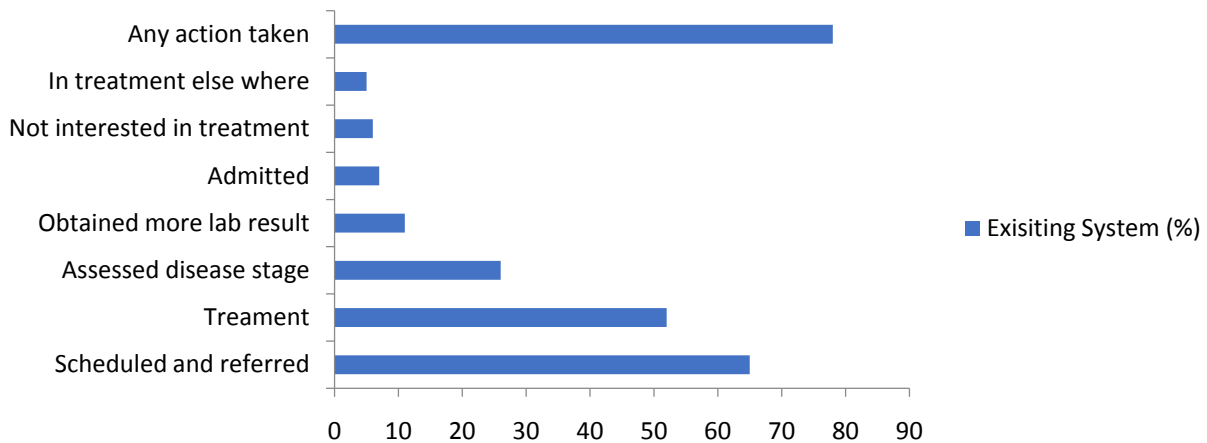
Exisiting System (%)

Figure 4.8: Patient Appointment List
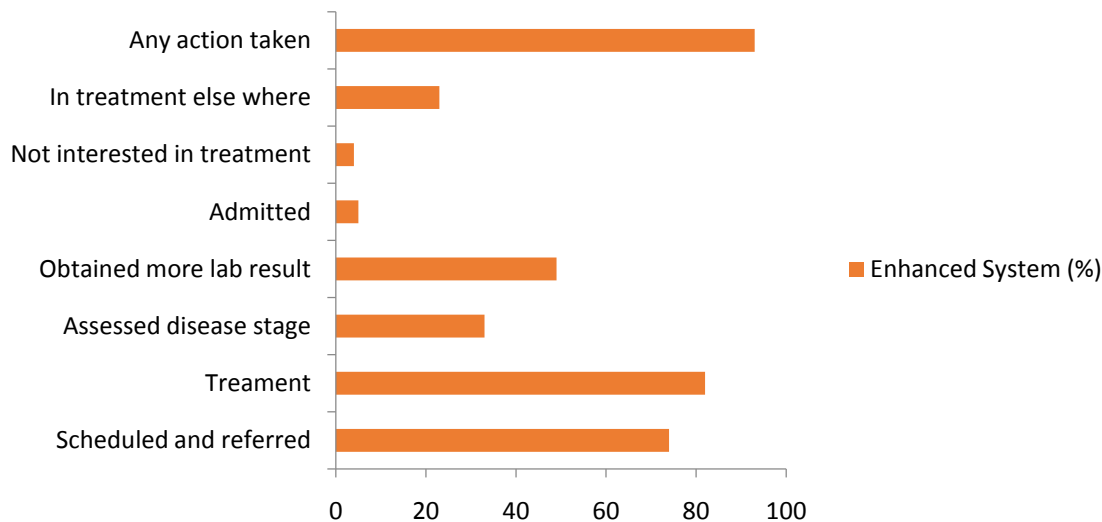
Enhanced System (%)

Figure 4.9: Patient Appointment List

For example, in Figure 4.8 of the former system only 11% of patients received medical test findings, which means that most didn't and may have missed out on the diagnosis of a disease. However, in comparison to this, 49% of patients requested medical test results when a new system was implemented. Only patients who are no longer receiving treatment should use the PHIE. Because of the patient's lack of interest in the results of a laboratory test, they may not receive treatment for their ailment.LaPHIE's early results were good, with 65% of patients scheduled and referred. As many as 400 persons in Louisiana have been diagnosed with HIV within the first 24 months of working with the organization, which helps to connect them with treatment. LaPHIE is available round-the-clock to help hospital patients connect with the nurses and doctors who care for them. As a result, the system offers a straightforward and cost-effective way to help those who might otherwise be unable to get the treatment they need. The improved approach in Figure 4.9, on the other hand, resulted in a 74% increase in the number of patients booked for treatment and referred.Only doctors, nurses, and nurses at Louisiana State University (LSU) have access to LaPHIE disease warnings, which are protected health information. Discussion groups and interviews with potential participants showed a strong preference for limiting access to medical professionals. It was shown that 82% of patients improved their engagement, 4% of patients decreased their interest in treatment, and 93% of patients took action to improve their healthcare.

6. CONCLUSION

As a system-wide activity that provides a nuanced perspective on the moving trend in technology with strong interest in the healthcare sector, the healthcare issues, and the direction that a government and healthcare facilities should consider which should be geared toward patient healthcare service satisfaction, the study aims to connect all participants and

their interventions. An organization or government that seeks to provide the best possible health care while minimizing the risks that may arise from inadequate or inefficient access to information is said to be providing a system designed to meet the needs of its patients.

7. RECOMMENDATION

All healthcare facilities should adopt the Patient Health Record (PHR). Medical services that plan to use the new system should schedule an upgrade to the upgraded system in a similar manner. To avoid data loss, it is highly suggested that an upgrade be assisted by an IT specialist. Working with the industry to design and roll out improved modules as a result of the opt-out transition and update current provider training.

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