Faculty of Computing

BSc Software Engineering (University of Plymouth)

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_PUSL2021 – Computing Group Project

Project Proposal Document

DR. CARE

Healthcare Management System

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INTRODUCTION

In today’s world rapidly involving information technology in every industry, there is massive growth in the healthcare industry. This proposal outlines the growth of the healthcare management system that solely focuses on enhancing the effectiveness and efficiency of healthcare providers of doctor's clinical services. Having a platform in place that will help centralized clinical operations such as a separate profile for each patient, viewing the past records of the patient, inserting new health records, updating current health status, and deleting the past records and reports, can generate prescriptions (it is generated into a template after filling in the blanks) this health care platform/system is an all-in-one that provides extra solutions including inventory, bills and to maintain the security and the privacy of the patient information by implementing separate patient numbers and generate an ID card for each patient with an RFID that’s the IoT part which is being developed. Enhancing these facilities lifts the weight of healthcare all over clinical operations and makes it more digitalized and automated. Imagining this healthcare platform benefits both parties' doctor can ensure that their medical history and comprehensive view of the medication journey.

Overview

The Health Care Management System (HMS) is a platform designed to help doctors monitor and manage their clinical operations such as patient records, reports, generating inventory, and billing for the health journeys. The system aims to provide easy access to patient information, ensuring security and privacy through separate patient numbers with physical ID cards and RFID numbers. The system also includes profile management, creating patient profiles with IDs and RFID, and data management for the insertion of patient health records and reports. The HMS aims to improve healthcare provider efficiency by ensuring the availability of accurate patient information. It will help healthcare providers carry out their responsibilities more successfully, make wise decisions, and prioritize patient care. The HMS is expected to transform the healthcare industry by prioritizing the effectiveness of healthcare professionals and ensuring the availability of accurate patient information.

Background Research

The healthcare management system includes improved administration and better patient care. The goal of this study is to create a digital management system that will boost the doctor's effectiveness and systems integration standards. It was able to produce a module that would provide some facilities, like booking doctors, test report slots, and getting health programs. This system consists of an admin handling part, which means the admin can manage users, systems, health program management, and manage booking of doctor's appointments and lab tests. Through this system, the admin can generate multiple reports according to his needs [7]. A module that would manage the admission bills and pharmaceutical payments; and a module that could monitor the medicine inventory of the hospital pharmacy. Problem statement because hospitals are associated with ordinary people's lives and daily routines the manual handling of the record is time-consuming and highly prone to error. The purpose of this project is to automate, or make online, the process of day-to-day activities. Each phase guided the researchers in the development of the study and helped them organize the workflow of each task. In conclusion, the researchers found that the system could speed up the working progress and productivity of hospital employees. It could also generate hospital reports that could help the users provide an overview of the hospital transaction within a specific date. It also provided the facility for searching for the details of the inquiring patient in the receptionist module. The system could reduce the workload in the hospital, resulting in better management and working performance. In general, the study resulted in a better improvement of hospital transactions. It has been recommended that there is a need to enhance the front-end design of the system. (K.Nishanthan, S.Mathyvathana, R.Priyanthi, A.Thusara, D.I. De Silva, & Dulanji Cooray, 2022).

In recent years, there has been constant concern in the field of healthcare, considering the risks to the health of the population caused by severe pandemics, the most recent example being the COVID-19 pandemic [1,2]. The COVID-19 pandemic has shown more than ever that the most valuable source for generating innovation in the healthcare management field is concern and not only information. To increase the chances of generating innovations, the amount of useful information must also increase [3]. Evidence of this is the provision and rapid sharing of scientific data and information. “Sharing relevant data and research findings for the new coronavirus outbreak (COVID-19)” [3]. Thus, a series of practices related to the elimination of payment for accessing scientific documents and the use of preprint servers were initiated [4]. Researchers and practitioners from all over the world have continued this initiative, encouraging people to make their work available to help in fighting the COVID-19 pandemic [3]. Programs, such as CORD-19 (CORD-19, 2020), MOBS Lab, MIDAS, ELIXIR, COVID-19 Data Portal, and COVID-19 High-Performance Computing Consortium, can provide a variety of resources as well for scientific research [4]. In addition to sharing data and research tools, the rapid dissemination of research results played an important role in building an objective dialogue that helped to facilitate the process of generating new research directions [3]

The results of research in several fields contribute significantly to the identification and adoption of important solutions that help to achieve future objectives. Many organizations that provide healthcare services face the existence of quite serious problems that can be solved through research and innovation [5]. (Păduraru, O., Moroșanu, A., Păduraru, C. Ș., & Cărăușu, E. M., 2022)

Health information systems (HIS) belong to the IT industry, which contributes to the global economy. Providing jobs for IT-specialist revenues from the activities related. The development of medical engineering and technologies in general and HIS in particular is related to changes in the needs of the healthcare industry including a steady increase of knowledge in the medical field, complexity of the examination, diagnostic, and treatment methods. (Elena Vaganova1,2, Tatiana Ishchuk1,Anatoly Zemtsov1,and Dmitry Zhdanov1,2)

OBJECTIVES OF THE PROJECT

The objective of this project is to develop and implement a fully functional Health Care Management System designed to improve doctor's efficiency, by providing a centralized and effective platform with the following functions:

- ✓ Create individual profiles for each patient it makes easier to get access to their personal and medical information.
- ✓ Allows doctors to view the patient's historical medical records, this gives better-informed decisions and treatments.
- ✓ Gives the ability to update patients' current health status.
- ✓ Gives the ability to upload, store, and manage new health records for each patient separately.
- ✓ Allows to delete patients records when necessary while adhering to legal and privacy standards.
- ✓ Provides an editable prescription template, so it helps doctors to prescribe treatments quickly and effectively.
- ✓ Creates doctor profiles that gives unique permission to access patients' data according to their roles.
- ✓ Generate unique patient ID cards with embedded RFID technology for easy identification and tracking. It makes quick and efficient for doctors as well as the pharmacist to prescribe the medical treatments and the medicine.
- ✓ Have a quick functioning search option to get patients details which doctors can use to get access to critical information without any delay.

Project Vision:

Our goal is to develop a modern health care management system that significantly increases the effectiveness and quality of healthcare services by empowering doctors with an all-in-one platform. This system will simplify patient management and improve communication. It provides access to historical data, improving patient care and overall operational excellence as a result.

Key Outcomes:

- ✓ Reduce administrative workload for doctors and facilitate quick access to patients' clinical information.
- ✓ Improved patient care and safety through up-to-date health records.
- ✓ Easy prescription generation and medication management
- ✓ Strong data security and privacy
- ✓ Increased operational effectiveness and decreased administrative costs.
- ✓ Simplify patient identification and tracking through RFID-enabled ID cards.
- ✓ Improved search and data retrieval tools for health professionals.
- ✓ Improved collaboration between health care teams.
- ✓ This health care management system revolutionizes the effectiveness of medical procedures and ultimately leads to better patient outcomes and more efficient medical practices.

Target Users

This website is related to healthcare management system which mainly focuses on the doctors. This platform is handled by the doctors whereas, they are establishing an ID card for each patient with an RFID.

Due to their busy schedule's workload, it makes easier if there is a website which can communicate with the patients through online. Doctors can go through it anywhere at any time. If the patient is far from the doctor or else out of the country, the doctor can keep in touch with the patients through the website. Doctors will get special profiles with special permissions to check on their patient.

1- Patients details plan – the foremost part which is included in this website is patient's details. This is the place where the doctor gets to know about the personal information of the patient and their health situations and the issues. Doctor will execute the health guidelines, therapies needed, and the medicines required.

2- Health Records- doctors get the ability to implement new health records or delete records also can go through with the past records and create the report of the patient. Sharing the results of the test and the treatment ideas required for the patients.

3- Generate Prescriptions- doctors will prepare prescriptions, this makes easier to decide medicines when patient needed and can refill prescriptions through the website when needed.

4- Sharing health tips- through this, doctors can share the health tips which are related to the patient's health, and they can communicate with patient too. Through the website doctor aware patients to how to prevent from the disorders as well.

5- Protecting the Privacy- this system keeps the patient's privacy safely and the doctor takes responsibility of the patient's privacy by generating a specific ID card for each patient.
Also, the patients can get to know about the doctor's qualifications.

6- Remote usable- doctors and patients can join through this website where internet connection is available. Doctors can update the necessary details and patients can communicate with the doctor anywhere around the world.

7- Patient's updates- doctors will be able to save the related information and the medical relevant images, test results such as x-rays of the patient with high security.

APPLICANTION FEATURES AND DESCRIPTION

Doctor Profile

- Special Profiles with permissions for doctors. Dr.Care will provide a special user profile for doctors with administrative permission to manage the system of their clinic.

Patient Profile Creation

- Ability to Create a separate profile for each patient. Using this function Doctors can make a separate profile for each patient and include their health records and reports in the profile for future references.

RFID Card System

- Generate an ID card for each patient with an RFID. Upon creation of the profile, Doctors can issue a RFID card to a patient and assign the Card's Number to the patient profile so that it will be unique from patient to patient.

Records Add / Remove Function

- Using this function Doctor can add new medical records or remove medical records from a patient's profile.

Health Status of the Patient

- Ability to update the current health status of the patient. After identifying a patient's illness, Doctor's can update the patient's health status, whether it's bad or if the patient needs immediate assistance.

Prescription System

- Ability to generate prescriptions for patients. This will help the doctor to create a prescription within the system and add it to the patient's profile. Moreover, Doctor can take out a printout at the same time if they are connected to a printer device. (it is generated into a template after filling in the blanks).

View Past Records

- Ability to view the past records of the patient. When you add health records to a patient's profile, the data will be stored in the database. And using this function you can always look up to a patient's past medical records and medical reports.

Search Function

- Ability to Search details about patients. Within this system, Doctors can look up to a patient's name through the search bar and get their details and the medical record history within few seconds.

Features & Functions Explained

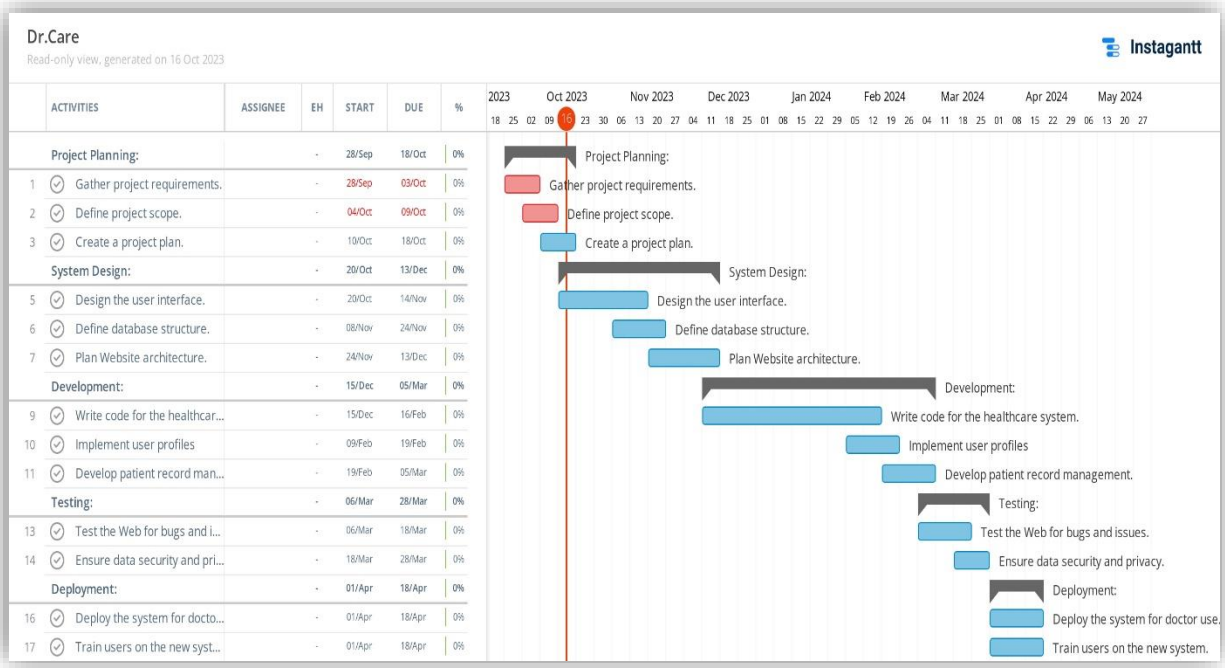
First, you must register as a doctor. Once you get the administrative privileges as a doctor, you can search for patient's profile using the name or the RFID Card Number. If the patient profile does not exist, you can create a new separate profile for a patient and add their medical records and reports. Then you can update the health status of a patient in the same profile according to the on-going disease/illness. Upon identifying a patient's disease / illness, doctor can issue a prescription regarding the medicines that the patient should take within the same system. Doctor will get a normal form to fill as the prescription. Upon creating the prescription and saving it, the system will automatically generate the details that are included in the form into an in-built prescription template. After that doctor will be provided with the opportunity to take a printout or send the prescription to a patient via email. All the details are stored in our database, due to that a doctor can look up to a patient's past medical records and prescriptions whenever they want.

TECHNOLOGIES TO BE USED

To create this Dr. Care website, it includes the following technologies as follows.

Language Used	React, PHP
Database Technology	Firebase
IOT Technology	RFID

TIME FRAME


Dr.Care
Read-only view, generated on 16 Oct 2023
Instagantt
ACTIVITIES
ASSIGNEE
EH
START
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%
Project Planning: 28/Sep 18/Oct 0%
1 Gather project requirements. 28/Sep 03/Oct 0%
2 Define project scope. 04/Oct 09/Oct 0%
3 Create a project plan. 10/Oct 18/Oct 0%
System Design: 20/Oct 13/Dec 0%
5 Design the user interface. 20/Oct 14/Nov 0%
6 Define database structure. 08/Nov 24/Nov 0%
7 Plan Website architecture. 24/Nov 13/Dec 0%
Development: 15/Dec 05/Mar 0%
9 Write code for the healthcar... 15/Dec 16/Feb 0%
10 Implement user profiles 09/Feb 19/Feb 0%
11 Develop patient record man... 19/Feb 05/Mar 0%
Testing: 06/Mar 28/Mar 0%
13 Test the Web for bugs and i... 06/Mar 18/Mar 0%
14 Ensure data security and pri... 18/Mar 28/Mar 0%
Deployment: 01/Apr 18/Apr 0%
16 Deploy the system for docto... 01/Apr 18/Apr 0%
17 Train users on the new syst... 01/Apr 18/Apr 0%
2023 Oct 2023 Nov 2023 Dec 2023 Jan 2024 Feb 2024 Mar 2024 Apr 2024 May 2024
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Gather project requirements.
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REFEREANCES

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