

**Faculty of Engineering and Technology**

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| **Computer Science Department** |

COMP433 – Group Assignment phase 1

# *Project Name:* **Hospital Management System**

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# Introduction

Our company presents a new project for the next care hospital.

The hospital has had a vision of providing world-class medical services since its inception in 2007 with state-of-the-art facilities and an experienced team of specialized healthcare professionals, they seek to take healthcare to a next level, we will help them out with this budget to make innovative software for the hospital.

One of the main issues in NextCare Hospital suffers from is its outdated methods of storing and updating Patient’s profiles, especially when a patient has long medical history such as suffering from multiple chronic diseases. Currently, the company uses Excel and Google Sheets to store all of its data. Furthermore, many departments in the hospital still use it, like Management Department where they follow ups on various patients’ reports, complaints, and so on all manually using paper and excel which are messy and difficult to use;

Financial Department also suffers from a lack of usable software, you have 3 ways to pay, cash, insurance payer or credit card, which is very important to have useable software to handle financial records in terms of time efficiency and professionality.

managing the schedule for patient visits withMedical staff is a must-to software because it's so badto read and generate in excel.

the new software will wipe these problems and handle them from A to Z, with the database management system providing backup copies of my data daily, and user-friendly interface customized to hospital needs, easy to insert patient profiles and update them automatically when any new data add like diagnoses, lab tests, and rad procedures, add a financial model in which the accountant easily add financial records and display the financial information of patients like insurance and so on, easy report generation on one click you can generate Financial report for patient payment record, same with Management Department where the patient can send a report through a mobile web application and the management have analytics of overall status of the hospital as a report from patient reports and Medical staff reports and the system reports with AI of status in the hospital.

All in all, the hospital's daily operations are outdated, highly vulnerable to efficiency and ease-of-use issues, and will be unable to manage the hospital's growth and vision. The hospital suffers from reliability and maintainability. The solution to these problems involves building customizable software that will enable next care to digitize all of the hospital operations and allow the hospital to streamline its communication in hospital departments and patient Medical staff through well designed API-driven web application approaches.

# System Features

1. **Centralized Database Management System Software:**

As mentioned, the hospital needs to update its methods of storing and retrievinginformation. They need to move away from storing the company’s information in Excel, to a specialized database that will more easily and reliably allow the hospital to perform actions such as adding, updating, and deleting from patient profiles, medical staff, and so on. Doing so will allow the hospital to improve data reliability since much of the reception department’s main issues were duplicated and scattered information.

Furthermore, the database will be centralized to the entire company. This means that instead of every department having separate physical repositories of data; all of the company’s information will be accessible to anyone with the required permissions. This will reduce information duplication, and improve the ease at which information can be retrieved, modified, and read.

Specifically, the database will contain all of the information relevant to hospital employees, medical staff salaries (weekly, monthly, quarterly, and yearly), employee/overtime bonuses, shifts, hours worked, vacation days, employee contracts, and the hospital’s overall hierarchy. The database will also include all non-medical related information such as any/all bills/transactions that the hospital has paid, and needs to pay.

1. **Patient registration and patient profile:**

The program is characterized by ease and high speed in patient registration, the receptionist takes the basic information of the patient from the identity and the personal phone or e-mail and health insurance, if any, that is associated with the data of health insurance companies. And enter it into a user friendly interface program for one time when registering the new patient The patient can log in to the phone program through a patient identification code that was given to him after registration finished, the receptionist can refer the patient to the initial diagnosis all the initial diagnosis information (diagnoses, chronic diseases, previous operations, etc.) is added to the patient's file,or recording him for a specific appointment, according to the specialist doctor.

1. **Phone application:**

Developing a mobile application, which can be downloaded via Google Play and the App Store, allowing the patient who was previously registered in the hospital (for privacy issues) to book advance appointments with doctors to review, and view the available review times for each doctor and the doctor’s official working hours by choosing the appropriate time for him and the doctor to be reviewed and waiting for approval of the reservation from the receptionist.

And the ability to view the patient's profile (the times of previous and upcoming reviews, old diagnoses, reports, laboratory tests, previous operations, and chronic diseases) with the inability to change, the patient can evaluate services and submit complaints and suggestions through the app. Notifying the patient of upcoming reservations and required examinations

1. **emergency registration:**

When the receptionist enters a patient in an emergency situation without registration he can add them to the emergency registration, which is a module where the receptionist enters the bed number, room number, and available information about the patient, then a warning appears repeatedly to the employee that there are emergency records that must be completed as soon as possible. After all the information necessary for registration is available, the registration is transferred to the main registration and removed from the emergency

1. **Doctor's department:**

* appears to the doctor when entering the patient identification code or his name, the initial diagnosis of the patient, and the vital signs that were previously examined by the pathogen (blood pressure, temperature, and blood test) and viewing the patient's file so that the doctor can quickly find out the necessary information without Wasting patient time with a lot of questions. A session is automatically opened for the patient and filled in by the doctor after completing the diagnosis of the case and implementing the patient-specific protocol by writing a full report of the patient's condition The session is closed and added to the patient's profile.
* the doctor can view a schedule of patients' reservations with him.

1. **Section integration:**

The doctor supervising the patient's condition can perform some procedures for the patient (giving medication, vital examination, stating the patient's condition, or transferring the patient to another department) inside the program without the need for paper communication or outside the program and being able to communicate with all other departments in a smooth and simple way that helps facilitate treatment procedures.

program structure helps all departments to stay connected to each other

1. **medical examinations:**

The program contains a high ability to continuously communicate between the program and the biometric devices so that information is automatically entered into the patient's profile without the need to waste time and effort and to avoid human errors. The program supports most types of devices in the testing laboratories.

1. **finance department :**

A simple and easy-to-use accounting interface is shown that contains a full report of the number of working hours for each employee inside the hospital and the vacations; taken through its connection to the identification fingerprint device And the salary calculation for each employee is the calculation of his job position and the agreed salary. Medical expenses are calculated and the hospital's monthly profit percentage is shown in a detailed report And send it automatically to the administration department

1. **Send a reminder:**

There is an additional feature in the program, which is sending a notification that contains a reminder of upcoming reservations, required examinations, and Periodic examinations, if any, by personal phone or e-mail Because some users did not download the application.

1. **Department of Accounting:**

all operations performed by the patient inside the hospital are calculated and an automatic discount is made according to the type of health insurance if any. Where each operation inside the hospital has a pre-priced Payment is made to the receptionist by cash payment or by visa card, taking into account health insurance And show the invoice to the receptionist with the ability to print it to the patient

after paying: the patient's treatment course is automatically sent from the program to the phone number or e-mail

1. **administration Department:**

The program is characterized by showing a comprehensive interface for hospital management that contains a report from the program that is formulated in an easy way and contains a summary of all complaints and suggestions from patients reports or supervisors working inside the hospital and matters related to financial affairs

And some warnings and problems are recorded by the program automatically, such as the end of the oxygen tank or the fullness of the rooms

1. **API-Driven Software**

ease-of-use and maintainability software by building an APIs for nextcare hospital from the ground up, It is easy to communicate with all interfaces, especially with the presence of the mobile application.

# **Software development process**

The software development processes that our team will use depend on the relevant

software features. In general, the entire software system will utilize an incremental

software process. Our team will also build a prototype for the programming user interface

since we will heavily rely on an API-driven solution. Furthermore, our team plans on

building a prototype for the graphical user interfaces of the desktop and websites with the same code without repeating using a new

technology same with mobile with a cross-platform framework like react. Regarding the payment method, we will reuse a formal system for payment.

Finally, since our software will utilize heavily on an API-driven solution; our team will use.