SLIIT Discover Your Future

BSc (Hons) in Software Engineering
Year 3

Assignment 1 - Case Study 1
Health Care System

SE3070 – Case Studies in Software Engineering **2024 Semester 2**

Smart Healthcare System for Urban Hospitals

Introduction

In urban centers worldwide, healthcare systems are critical in providing timely and efficient care to patients. A significant source of delays and increased operating costs is managing patient records and scheduling appointments. Currently, in Sri Lanka, this process is predominantly manual, particularly in public hospitals (both private and government operated), which serve the majority of the population. With the rising interest in digital health technologies, there is an opportunity to improve the efficiency and effectiveness of healthcare delivery through digital solutions. A similar concept has been successfully implemented in various parts of the world, such as the My Health Record system in Australia.

Objective

In this case study, your teams are bidding to develop a software solution for the main urban hospitals (private and government operated) in Sri Lanka. The goal is to create a smart healthcare system that manages patient records and appointments efficiently across all such hospitals in the country.

- **First Phase**: Develop a design for your software that offers comprehensive functionality to address the complexity of healthcare systems, as well as high usability for patients and healthcare professionals.
- **Second Phase**: Develop, test, and evaluate a prototype for your software platform, demonstrating both the usability features and the flexibility of the system to be configured for different hospitals.

Requirements

In the first phase, you are required to demonstrate your understanding of the domain by creating a software functional design (using UML) and user interaction designs for the software.

Case Study Details

The proposed system will involve individual patients receiving a digital health card, which they will use to access various healthcare services. The card is tied to a patient account which could be accessed via the web or a mobile app (similar to Australia's My Health Record system), a physical card with a bar code, or a mobile application with a QR code or other innovative interactions.

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When a patient arrives at a hospital, they will present their digital health card at a kiosk or to a hospital staff member, who will scan it to access the patient's medical records. This process will provide audio or visual feedback indicating that the card has been successfully read. This is crucial in busy environments such as hospitals, where staff need to ensure that each patient's information is correctly accessed and recorded.

Patient Account Management

When patients receive a digital health card, they will hold an account with the healthcare provider. Each account will include initial medical history and demographic information. Patients can update their information and manage their appointments online through the hospital's website or a mobile application. They should also be able to view their medical records, track their treatment history, and make appointments, and payments for services, if applicable.

System Flexibility

The system must be designed to manage different types of healthcare services and payment models. For instance, all costs will be covered by the government (in the case of most procedures at government hospitals) but it is also possible that the patients may use various payment options such as credit cards, and cash or use their health insurance coverage in case it is a private hospital.

Data Analysis and Reporting

Healthcare managers need information from the digital health system to plan resources and improve service delivery. For example, to schedule staff, identify peak times, and manage patient flow, they need data on patient visits and service utilization. The system should generate statistical reports for healthcare managers to analyze different scenarios and make informed decisions.

Existing Systems

Different countries have different needs and regulations when it comes to managing healthcare systems. The following resources provide insights into various digital healthcare systems around the world:

- Australia's My Health Record
- Singapore's National Electronic Health Record
- UK's NHS Digital
- Denmark's National Health Record

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Important Note

The information in this document is typical of what you might expect from a client in the industry when developing software systems—possibly incomplete, ambiguous, and vague. You are encouraged to discuss any queries with the module delivery team during tutorials to clarify any aspects of the system design and implementation.

Remember, your clients will rarely be computer-savvy. It is your job as practicing software engineers to translate their requirements into formal designs and ultimately a functional software package. If the clients could do this themselves, they wouldn't need our expertise.