CSC13002 – Introduction to Software Engineering

Project Assignment 0 (PA0)

GROUP 08

I. INTRODUCTION

i. Group Information:

- Group name: 10Cent

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ii. Problem Statement: Inefficiencies in Patient Management Lead to Detrimental Outcomes

The current healthcare system suffers from inefficiencies in patient management, leading to a cascade of negative consequences for both patients and healthcare providers.

- Discharged patients:
  - Difficulty accurately recalling their illness history hinders effective post-discharge care, potentially leading to misdiagnosis or readmission due to incomplete or inaccurate information.

- Unnecessary Hospital Admissions:
  - Inefficiencies contribute to unnecessary hospital stays, inflating healthcare costs and straining limited resources.

- Treatment Adherence:
    - Patients struggling to remember or manage medication dosages can compromise treatment effectiveness and lead to potential health risks.
- Challenges in Accessing Care:
    - Geographical distance, financial burdens of transportation, and difficulties in assessing symptom severity can delay or prevent patients from seeking timely medical attention, causing anxiety and potentially compromising their health.
- Pressure on Healthcare Professionals:
    - Work overload due to inefficiencies increases the risk of errors and compromises the quality of service healthcare professionals can provide.
    - Difficulty in prioritizing critical cases due to inefficient systems can lead to potential patient harm.

This highlights the urgent need for solutions that improve patient management processes, ensuring better care, improved health outcomes, and a more efficient use of healthcare resources.

iii.   Our Solution: LOGiT

LOGiT - a mobile application that is designed to meet the critical demand for improved supervision and administration of patient health, especially for those in need of continued care post-discharge. Our objective is to alleviate the strain on hospital resources caused by extended, and often avoidable, hospital stays that also consume patients' time.

Utilizing the widespread accessibility of smartphone technology, **LOGiT** strives to enhance communication between patients and healthcare providers, improve medication adherence, and facilitate more accurate diagnosis and treatment.

In doing so, **LOGiT** aspires to revolutionize the patient care model by bringing the oversight of health management into the comfort and convenience of the patient's home, thereby enhancing the quality of care and patient satisfaction.

II. TARGET USERS AND ENVIRONMENTS

i. Target Users:

Our LOGiT app aims to serve 3 actors: patients, physicians, and hospital administrators.

1. Patients

− Characteristics: Proactive individuals of all ages seeking healthcare services at hospitals or private clinics. They value convenience, efficiency, and clear communication.

− Demographics: Broad spectrum, those seeking guidance in navigating the healthcare system.

− Needs:

- Secure access to personal medical records for informed decision-making.
- Streamlined communication channels with healthcare providers.
- Convenient appointment scheduling and medication management tools.
- Educational resources to enhance healthcare literacy.

− Objectives:

- Take a more active role in their healthcare journey.
- Improve communication and understanding with healthcare providers.
- Enhance treatment adherence and overall health outcomes.

2. Physicians

- Characteristics: Medical professionals (doctors, doctor assistants) committed to delivering optimal patient care. They value efficiency, clear communication, and access to comprehensive patient data.

- Demographics: Varied across specialties and experience levels, with a focus on leveraging technology to improve patient care.

- Needs:
  - Secure messaging platform for efficient communication with patients.
  - Comprehensive patient data management tools for informed clinical decision-making.
  - Streamlined administrative workflows to maximize time spent on patient care.
  - Access to educational resources and clinical decision support tools.
  - Prioritize critical cases based on patient condition in real-time.
  - Tools to support remote patient care for efficient management.

- Objectives:
  - Improve communication and patient engagement.
  - Develop personalized treatment plans based on comprehensive patient data.
  - Optimize clinical workflows for efficient patient care delivery.
  - Stay informed on the latest medical advancements.

3. Hospital Administrators

- Characteristics: Individuals responsible for optimizing hospital operations and ensuring patient satisfaction. They value efficiency, resource allocation, and positive patient experiences.

- Demographics: Healthcare administrators and managers across various hospital sizes and specialties.

- Needs:
  - Streamlined patient management tools for efficient appointment scheduling and resource allocation.
  - Improved communication channels between patients and healthcare providers to enhance patient satisfaction.
  - Automated administrative tasks to empower staff and improve service quality.
  - Data-driven insights to optimize resource utilization and operational efficiency.

- Objectives:

    - Improve patient flow and reduce wait times.
    - Mitigate the hospital overload.
    - Enhance patient experience and satisfaction with healthcare services.
    - Optimize resource allocation and improve operational efficiency.
    - Make data-driven decisions to improve hospital performance.

ii.   Environments:

- The LOGiT app is designed to run flawlessly on both iOS and Android devices, including smartphones and tablets. This flexibility empowers users to access the platform from their preferred device, catering to individual preferences and comfort levels.

- Internet connectivity allows users to browse available healthcare providers, schedule appointments, communicate with healthcare professionals, and access other essential features.

III.   KEY FEATURES

LOGiT is developed to provide physicians and patients with advanced technological solutions for the meticulous management of health statuses.

1. General features (physicians and patients):

- Sign up/ Log in: Allow users to create an account and log in to use the app.

- Account authentication: Confirm user's information, and ensure confidentiality and protection of users' data.

- Appointment scheduling: streamlines the arrangement of appointments, enabling both doctors and patients to schedule and view upcoming appointments.

- Communication: direct contact between patients and doctors, encompassing symptom reporting and messaging.

- Reminders: This utility allows users to create personalized alerts for taking medications, scheduling appointments, or other daily healthcare-related activities.

- Edit profile: allows users to edit their information.

2. **Physician's exclusive features:**

− Real-Time Health Monitoring: Doctors can monitor their patient's health status in real-time.

− Immediate Alerts: Physicians receive instant notifications if a patient reports abnormal symptoms. This allows for quick assessment and prompt medical advice, ensuring timely intervention.

− Update Patient's Illness status: Allow physicians to add new medical records after a checkup at the facility.

− Appointment Arrangement: The system enables doctors to promptly arrange appointments or follow-ups, when necessary, based on the real-time data and notifications received.

− Create Doctor-Patient Connection: The doctor is notified immediately upon receiving the connection request, then can choose to accept or decline based on the sender's information given in the notification, therefore preventing mismatching.

3. **Patient's exclusive features:**

− Reminders: This utility allows patients to create personalized alerts for taking medications, scheduling doctor's visits, or other daily healthcare-related activities.

− Health blog: The application provides the patient with health blogs per their current health status (the blogs and articles are collected from reliable sources).

− Bookmarking: From the blogs, users can "bookmark" – save the blogs that are meaningful to them for later reading.

− Self-report abnormal symptoms: The system permits patients to log any unusual symptoms they experience and track symptom progression for their doctor's review.

− Send Doctor-Patient Connection Request: The patient sends a connection request to the doctor by scanning the Doctor's QR code or typing the Doctor's text code, therefore ensuring the authenticity of

4. **Administrator's exclusive features:**

- Offer assistance: Receive direct requests for support from users, thus ensuring prompt service.
- Database administration: Exclusive access to facility databases to ensure security and to manage users' account information and roles.

IV. TOOLS SETUP

- Trello: we use Notion to manage the processes of our team project, the meeting notes, and the tasks of each member.
- Drive: we use Drive to store team members' opinions on projects, and report on our team's project progress reports.
- GitHub: we use Drive to manage and store our team's source code.

- Figma: Use the page design and basic functions of the app to get an overview to help us write programs and tests more easily.
- Android Studio: allows us to test our application on a variety of devices and Android API levels without needing to have each physical device.
- Visual Studio Code: Visual Studio Code (VS Code) is a free and open-source code editor developed by Microsoft, used to execute LOGiT applications.
- Firebase: used to store and manage user data for the LOGiT app. Used to create and manage a database system that can be used to retrieve data to handle requests of the LOGiT app.
- Firebase Authentication: Provides back-end services, easy-to-use SDKs, and ready-made UI libraries to authenticate users to your app. It supports authentication using passwords, phone numbers, and popular federated identity providers like Google, Facebook, Twitter, and more.

V. PROGRAMMING LANGUAGES

- Dart: Dart is used to develop web applications with Flutter, a web and mobile application development framework. Flutter uses Dart to create apps with

responsive and high-performance user interfaces (UI). Dart can be compiled into native code for both platforms, helping Dart applications run quickly and efficiently.

– Framework Flutter: offers an impressive collection of user interface elements that are straightforward to learn and apply. This accessibility has accelerated our front-end development process, enhancing productivity without compromising the aesthetic and functional quality of our user interfaces. Additionally, the ability to compile Dart source code directly into machine code significantly boosts the performance of our application's frontend components.