

## CHAPTER 2. RELATED TECHNOLOGIES AND THEORIES

### 2.1. Technology Overview

#### 2.1.1. Rest API

A comprehensive overview of Rest API based on the cited journals reveals its pivotal role in modern healthcare application development, particularly in enhancing interoperability, data exchange, and system integration. A research shows its utility in Info Hospital, a web or mobile application-based healthcare system, highlighting its significance in facilitating seamless communication between different components of the application. [1] Furthermore, Rest API's role in database design, emphasize its importance in ensuring efficient data management and retrieval processes. [15] Its performance in cross-platform application development, emphasizes its versatility and suitability for developing healthcare solutions that cater to diverse technological environments. [2] Additionally, Rest API's integration with electronic health records, showcases its capability in enhancing data accessibility and streamlining healthcare management processes. [3] The cited literature collectively highlights Rest API's significance in modern healthcare application development, serving as a foundational component for enabling efficient data communication, interoperability, and system integration.

#### 2.1.2. Flutter

Flutter is a cross-platform framework by Google, empowers developers to build high-performance mobile apps for both Android and iOS using a single codebase. Its standout feature, hot reload, accelerates development by instantly reflecting code changes in the app, fostering rapid iteration and experimentation. This efficiency is particularly beneficial for projects like Info Hospital's healthcare system, where responsiveness and user experience are critical [1].

### 2.2. Functional Requirements

#### 2.2.1. Register and Login

Register and login functionalities are fundamental components of the application, enabling users to create accounts and authenticate themselves securely. Users can register by providing necessary information such as name, email, phone number, and password. Upon registration, users can log in using their credentials to access the application's features and personalize their experience. A study emphasized the importance of robust

authentication mechanisms in healthcare applications to ensure data privacy and security [20].

### 2.2.2. Consultation

The consultation feature allows users to schedule and conduct medical consultations with healthcare providers online or offline. Users can search for available doctors and schedule appointments based on their preferences. The consultation component facilitates seamless communication between patients and healthcare professionals, promoting timely access to medical advice and support. A study highlighted the significance of teleconsultation in improving healthcare accessibility and patient outcomes [16].

### 2.2.3. Medical Checkup

The medical check-up component enables users to schedule and manage appointments for routine medical check-ups and screenings. Users can select specific medical services or procedures and choose preferred dates and times. This feature promotes proactive healthcare management and early detection of potential health issues. A study demonstrated the application of mobile-based appointment scheduling systems in hospital settings, highlighting their efficiency in optimizing resource utilization and patient flow [14].

### 2.2.4. Doctor Schedule

The see doctor schedule feature provides users with real-time access to the schedule of available doctors for consultations and appointments. Users can view the availability of doctors and their working hours. This feature helps users make informed decisions when scheduling appointments, ensuring they choose the most suitable time and healthcare provider for their needs. A study emphasized the importance of transparent and accessible doctor schedules in improving patient satisfaction and healthcare delivery efficiency [1].

### 2.2.5. Call Ambulance

The call ambulance feature enables users to request emergency medical assistance quickly and efficiently. In case of medical emergencies, users can initiate a call to emergency services directly from the application, providing their location and relevant medical information. This feature ensures prompt response and timely arrival of medical assistance, potentially saving lives in critical situations. A study highlighted the effectiveness of mobile telehealth systems in facilitating emergency response and patient information presentation [22].

### 2.2.6. History of Appointment

The history of appointment feature allows users to view their past medical appointments and consultations. Users can access details such as appointment dates, healthcare providers, and medical services received. This feature enables users to track their healthcare history, monitor treatment progress, and refer to past medical records when necessary. A study emphasized the importance of maintaining comprehensive medical records for effective patient care and continuity of treatment [22].

### 2.2.7. Appointment List

The see appointment list feature provides users with an overview of their upcoming appointments. Users can access details such as appointment dates, times, and locations, as well as any associated reminders or notifications. This feature helps users stay organized and informed about their healthcare schedule, reducing the likelihood of missed appointments or scheduling conflicts. A study highlighted the importance of user-friendly appointment management systems in enhancing patient engagement and adherence to medical treatments [9].

### 2.2.8. Notifications

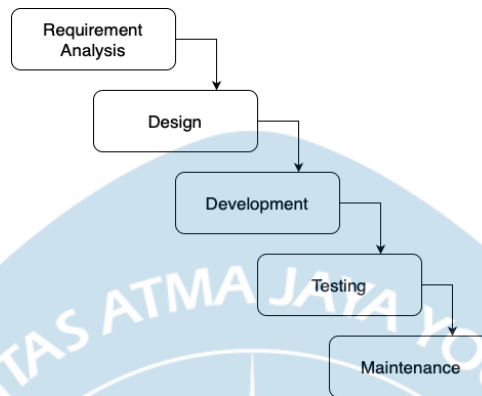
The notifications page in a hospital mobile app plays a crucial role in delivering real-time information to patients, doctors, and hospital staff, enhancing operational efficiency and patient satisfaction [1]. Utilizing Flutter technology for its development, this feature ensures cross-platform compatibility and near-native performance, integrating push notifications through Firebase for effective management [16]. The design prioritizes an intuitive user experience with categorized and prioritized notifications, ensuring quick access to vital information [8]. Security and privacy are paramount, with encrypted notifications and strong authentication mechanisms like two-factor authentication [3]. Examples include COVID-19 management apps and hospital bed management systems that provide real-time updates on patient status and bed availability [14]. Continuous evaluation ensures the notifications system meets user needs and adapts to technological advancements [4].

### 2.2.9. Profile User

The user profile page provides a comprehensive overview of your personal information sourced from the registration process, including your full name, chosen nickname, email address, phone number, and assigned role within the system or community. Your full name serves as a unique identifier, while the nickname offers a personalized touch. The email address acts as the primary mode of communication, and the phone number, if provided, offers an additional contact option. Your role delineates your

position or privileges within the system. It's crucial to ensure the accuracy of this data for effective communication and interaction within the platform. Any necessary updates can be made through the settings or by contacting support.

### 2.3. Data Analysis



*Figure 2. 1 Waterfall Method*

Data analysis in technology research is used by authors to collect data from existing technology and then pour it into the technology that will be developed. In this research data collection, the author collected data from existing journals and conducted research interviews at one of the hospitals. In building this hospital application, the author used the waterfall method. The waterfall method is a development process that is shaped like a waterfall.

The waterfall method consists of requirements analysis, design, development or implementation, testing or verification, and maintenance. In the requirement analysis stage, the author analyses existing technology, then collects data and designs the development of new technology that will be implemented in the author's application development. A study discusses the requirements of a web/mobile health care system, detailing features like registration account, patient management, appointment scheduling, and electronic health record integration [20]. In the design stage, the author begins to express his ideas so that they can be expressed in code form. In this stage also offer discussions on designing mobile healthcare applications, considering factors like data security, usability, and integration with existing electronic health record systems [3]. In the development or implementation stage, the author begins to build applications with the technology that has been designed and implement the details of mobile apps using Flutter or other technologies, covering topics like UI development, backend integration, and database management [6]. In the testing or verification stage, the author carries out testing to ensure that what has been created is as designed after the technology has been successfully built, including unit testing [12]. The last phase of the waterfall project management model is the maintenance phase. In this phase, developer make sure the given good or service satisfies the needs and expectations of the customer also highlighting the importance of continuous monitoring, bug fixes, and user feedback integration [14].