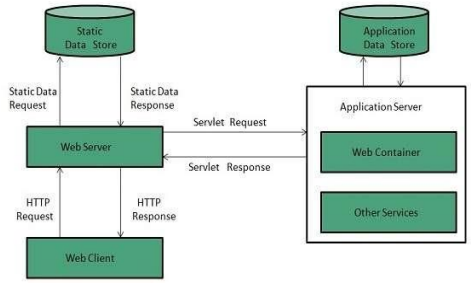

Figure 1. How Web Servers work

B. Client Server System

Client-server system is a software architecture that consists of two components: the client and the server. The client sends requests to the server, and the server responds to the requests. They use different protocols, such as FTP, SMTP and HTTP, to communicate with each other. Client-server system enables data exchange between the client and the server, which have different roles and functions. Client- server system is widely used in various applications in the modern computing world (Oluwatosin, 2014).

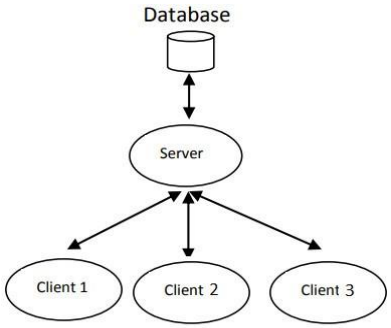

Figure 2: Interprocess communication among client and server Source: (Oluwatosin, 2014)

C. WhatsApp Gateway

The WhatsApp Gateway is an online application that facilitates sending and receiving messages through WhatsApp using the REST API or panel provided. It's essential to note that the programs on the WhatsApp Gateway aren't affiliated with WhatsApp Inc, and all trademarks are wholly owned by WhatsApp Inc. Please note that the software warranty only covers processing, sending, and receiving data, as illustrated in Figure 3 (Gumgum Darmawan et al., 2023).

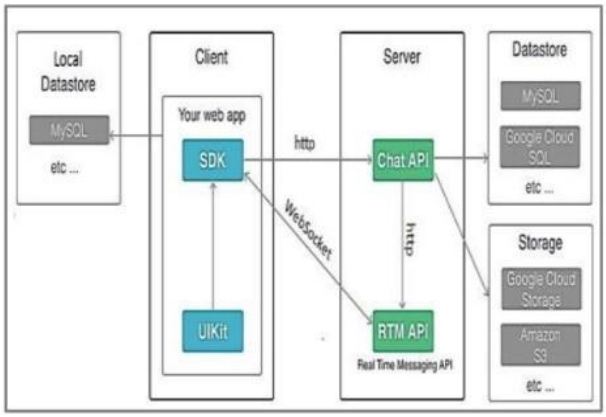

Figure 3. Architectural Chat API Source: (P. F. Network, 2021)

State-of-the-Art

The reservation system integrates with the use of the WhatsApp Business API, to enhance the customer experience. You can increase the likelihood of notifications from your business being opened and read on the customer's mobile screen by engaging with them through the application they are accustomed to using. The implementation of WhatsApp Business API can elevate your corporate communications to a higher level. (Karix, 2023).

Research Method

The research was carried out using the waterfall method, where this method emphasizes sequential and systematic phases, starting from the specification of consumer needs and progressing through the process of planning, modeling, construction, and deployment, which leads to continuous support for a complete software.

Data collection techniques are carried out by means of:

- Interviews with stakeholders to get the information needed in the research.
- Observation, conducting direct research into the field to find out what problems are faced and how to solve them.
- Literature study is a data collection technique by conducting a study of books, literature, notes, and reports that have to do with the problem being solved.

Results and Discussion

A. Design and Implementation

The web-based application was employed to establish the online clinic reservation system, outlining the involvement of stakeholders. Figure 1 illustrates the system model constructed.

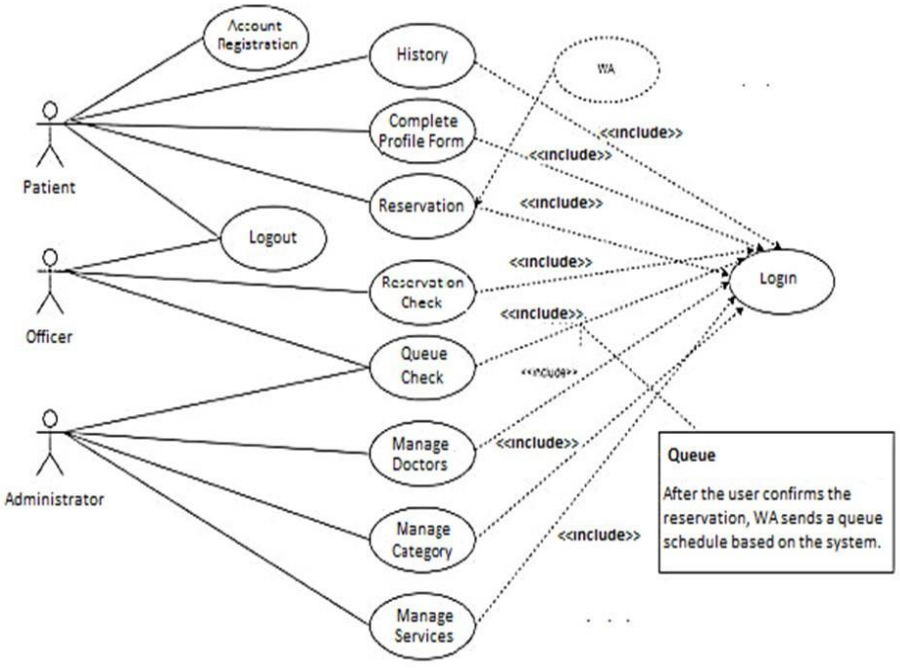

Figure 4. Use Case Diagram of Reservation

The database used in building this online clinic reservation system uses MySQL, which is an overview of this design as shown in Figure 5 below.

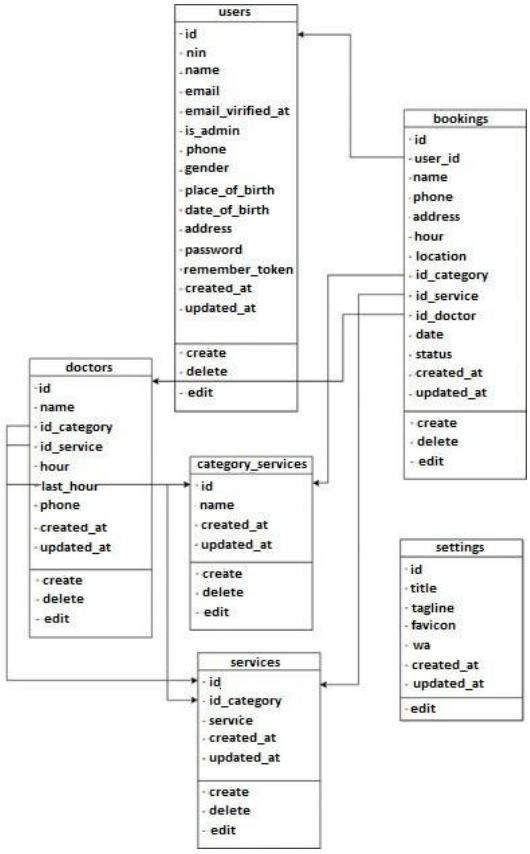

Figure 5. Reservation System Class Diagram

The online booking system for the clinic starts from the login page. This system is designed for three types of users: Users, Operators and Administrators.

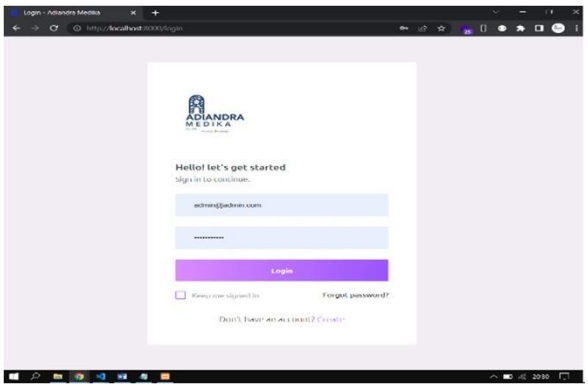

Figure 6. Reservation Login View

The Admin main page is used to add new patient data, booking data, data on the number of doctors, patients, and Queue data.

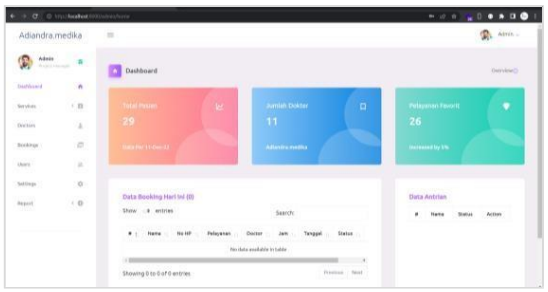

Figure 7. Admin Home Page

The booking table data page displays patient data, doctor, doctor filters, status.

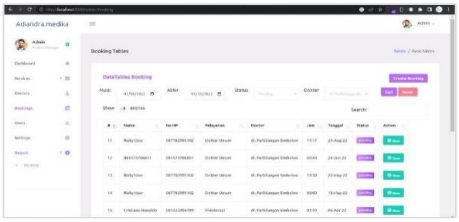

Figure 8. Admin Booking Table Page

Patients can make bookings by selecting the date, time, service and doctor from the patient page. If the patient does not enter all the required information, the system displays a warning message, as shown in Figure 9.

Figure 9. Reservation Page

The following Figure 10 displays a reply message from the system to patients received through the WA application, in the form of a notification number, date of registration, name, time, service, doctor, and patient address.

Figure 10. Reply message

Testing is carried out with the assumption that patients will often use the application to place orders, so a quick test is needed to determine system performance during user access. Figure 10. shows the results of 1.7 seconds to 2 seconds.

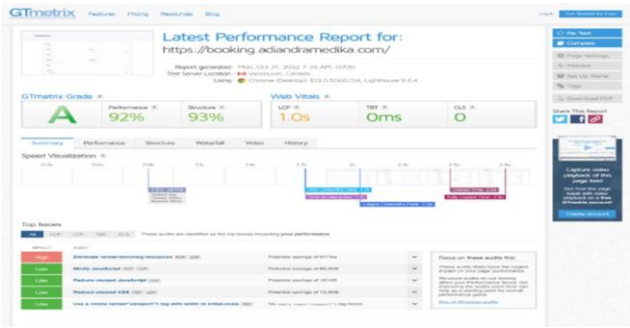

Figure 11. Testing using GTmetrix

A result of 1.7 seconds to 2 seconds means that the software takes between 1.7 and 2 seconds to fully load in the browser. This is the time measured from the time the user requests the page until the page is fully rendered. According to GTMetrix, a good loading time is less than 3 seconds, so the software performance can be said to be quite good.

Conclusion

This is an online-based registration system. It allows clinic clients to register at different locations. The system has a database for the processing of requests. The architecture of the system is client/server-based, as it is online. The system incorporates three distinct user groups: patients, administrative and staff. A major advantage of the online system is that clinic patrons are able to register easily from any device and venue. Clinic information is managed through a web application that is integrated with WAG. This web application provides queue replies, which facilitates precise and accurate registration. It saves time wasted while queuing at the registration counter, limits registration communication via telephone, and provides fast replies and optimal service for patients. The system's effectiveness and efficiency in data collection reduces the use of paper and document accumulation. Moreover, patient data management becomes

more orderly and faster during the process of tracking data. Finally, the system monitors the number of reservations based on patient data tables, making it easier for operators to check per day.

Website administrators can manage services, categories, doctors, and queue status using this system. Customers can view and select available doctors, register online, and view their history. The clinic's online registration system will be further enhanced by incorporating comprehensive reporting features that meet the necessary requirements.

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