EDUCATIONAL – BASED
C H A T B O T B U I L D E R

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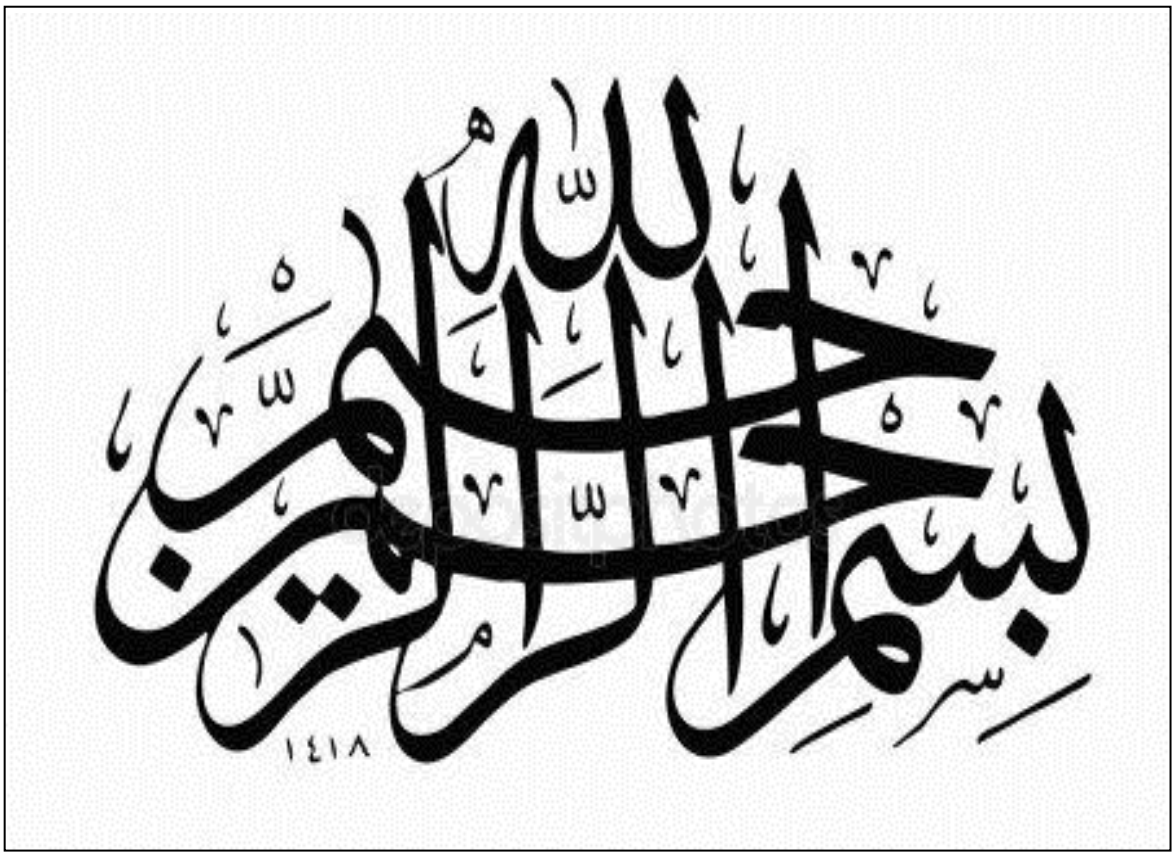
Islamabad (2023)



IN THE NAME OF ALLAH THE BENEFICENT THE MERCIFUL

Department of Computer Science

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Final Approval

Dated: 31st May 2023

It is certified that we have read the project report title "ChatBot Builder" submitted by Bisma Kalsoom, 4104-FBAS/BSCS/F19 and Tahreem Asif, 4142-FBAS/BSCS/F19, and we judge that this project is of sufficient standard to warrant its acceptance by the International Islamic University, Islamabad for the BS Degree in Computer Science.

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DEDICATION

We think that we should dedicate a project, which means the hard work of our day and night to everyone who has assisted me most or encouraged me most. So, who encouraged us and assisted us through this journey is first of all my guardian.

"ALLAH".

I also dedicate this project to my much-loved Parents who have always completed our desires, respected faculty teachers especially to my supervisor **Madam Shireen Tahira** who were accommodating and helpful during the project and also to all those who prayed for my success and remained persistent with me throughout the period.

DISSERTATION

A dissertation submitted to the Department of Computer Sciences, International Islamic University, Islamabad, In particular fulfilment of requirements, for the award of the degree BS in Computer Science.

DECLARATION

We hereby declare that this application "ChatBot Builder" neither as a whole nor as a part thereof has been copied out from any source. It is further declared that we have done this project with the accompanied report entirely based on our efforts made under the proficient guidance of our teacher and supervisor **Madam Shireen Tahira**. No portion of the work presented in this report has been submitted in support of any application for any other degree or qualification of this or any other university or institute of learning. And if any part of the system is proved to be copied from any source or found to be the reproduction of any project, we shall stand by the consequences.

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First of all, we are thankful to Allah Almighty the Merciful, the Most Beneficent and the source of all Knowledge, for granting us the courage, understanding and knowledge to complete this Project.

We are thankful to our parents, who supported us wholeheartedly in our studies and the position on which we are standing today is only possible because of their efforts.

Here we take the opportunity to acknowledge the efforts put up by some of our teachers in helping us pave our way to the ultimate end of this degree. I express my appreciation to our supervisor **Madam Shireen Tahira** for supporting and providing us with the opportunity to Enhance our learning and knowledge

I would like to mention my siblings and Friends, here who were there to help us whenever we got stuck somewhere in the development or later phases.

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Project In Brief

Objective:	This project aims to create a user-friendly platform for **Educational-Based Businesses** that don't have coding knowledge. Our application allows them to easily create and customize ChatBots without the need of programming skills.
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Supervisor:	**Madam Shireen Tahira** Department of Computer Science and Software Engineering, International Islamic University, Islamabad.
Date Started:	March 2023
Date Ended:	January 2024
Technologies:	React, Python & Postgres (database)
System Used:	intel core i5
Operating system:	Windows 10 Pro

ABSTRACT

In today's world, the field of Information Technology has advanced so much that nothing is impossible, so as students of Computer Science, it is crucial for us to think creatively and come up with innovative software ideas. Because by doing so, we can contribute to our society by creating a software that brings various benefits to people's lives.

Our application is the no-code Educational-Based ChatBot builder, which has been specifically designed for companies that serve the educational market. This is a user-friendly platform that allows users to create ChatBots without any coding knowledge or experience. It gives educational institutions the ability to improve the way they interact and communicate with end-users such as students, customers, or clients. The user-friendly interface of the no-code ChatBot builder makes it simple for educators to create and modify ChatBot conversations.

Through this application, the ChatBot can be customized to meet certain needs and goals, such as answering frequently asked questions, giving course information, recommending study materials, and assisting users with enrollment procedures. The ChatBots can be deployed to a specific communication channel that is WhatsApp Business which will enhance the learning experience and provide instant support to end-users or customers. This application simplifies the process of developing educational ChatBots by eliminating the need for technical expertise and increases the implementation of ChatBot technology in the educational sector, which will then allow for more effective communication and knowledge distribution in the end.

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Chapter 1
Introduction

1. Introduction

This chapter includes the introduction of proposed system and its scope. Our Educational-Based ChatBot Builder is a software that will enable Educational-Based businesses, to come and create ChatBots without having the need of extensive programming knowledge. Our application will offer a user-friendly interface, allowing users to design and customize their ChatBots according to their own needs and requirements.

The purpose of this application is to make online interactions between the Business Owners (Admin) and the End-Users (students, customers or clients). This interaction will improve customer engagement and will make it easier for businesses to interact with their customer, by getting feedback etc.

The scope of this system is to target the audience of our proposed system. The audience of our proposed system are individuals and organizations involved in the field of education. The primary target audience for our application includes educators, students, and educational institutions.

1.1 Introduction of the Project

It is a real client-based project. Omsre International is a dynamic and forward-thinking company dedicated to empowering businesses of all sizes to achieve remarkable growth and lasting success. With a strong commitment to excellence, they offer a comprehensive range of services designed to address the diverse needs of modern enterprises. Through their expertise in marketing, branding, business consulting, business strategy, and digital platform solutions, Omsre International equips businesses with the tools and strategies necessary to navigate today's competitive landscape with confidence. Moreover, their digital platform solutions offer innovative technologies and solutions to optimize business processes and enhance customer engagement. With a customer-centric approach and a commitment to excellence, Omsre International is a reliable partner for businesses to help them reach their full potential and succeed in the worldwide market.

Our project aims to offer an innovative solution to improve the education marketplace. Using AI and language technology, these ChatBots help students get more involved, make administrative tasks easier, and improve communication and teamwork between different people involved.

As technology continues to advances, ChatBot builders for educational institutions will certainly contribute to a more efficient, personalized learning environment. Through our application we will introduce **templates** and integrate the created ChatBot to WhatsApp Business.

We will also be adding a new feature to our ChatBot builder that is **Voice Integration**. Through this users will be able to talk to their ChatBots instead of typing their questions or commands. This feature will use voice recognition technology to understand what you're saying and convert it into text so that the ChatBot can understand. It then processes your voice commands and provides the appropriate responses or actions. Overall, voice integration adds a new aspect to the educational ChatBot experience, making it easier and more natural for users to engage with the ChatBot and access the information or assistance they need.

Our application will optimize administrative processes and improve efficiency. These ChatBots can be used to make things easier and faster for the people who work in the educational institution, like teachers and administrators etc. For example, ChatBots can automate tasks like admitting students, registering them for courses, creating schedules, and answering questions about grades. Which basically means that instead of spending a lot of time on these administrative tasks, the ChatBot can handle them quickly and efficiently, teachers and administrators have more time to focus on what they do best: providing high-quality education and building strong relationships with students. They can spend more time teaching, helping students, and creating a positive learning environment. These ChatBots not only help in these tasks but they can also be used in something called data collection and analysis. This basically means that they can gather information and study it to find useful insights. These insights can be used to make better decisions and improve the educational institution as a whole.

So, overall, the ChatBot, made through our application, for educational businesses help automate administrative tasks, save time. Making it easier for teachers and administrators to provide a good education environment.

1.2 Purpose

The core purpose of developing this system is to create ChatBots that assist with administrative tasks and provide information to users. Its main purpose is to make learning and accessing information easier for people.

For example, if you need to know the schedule for your classes or want to find information about a specific subject, you can simply ask the ChatBot, and it will provide you with the relevant details.

Our application allows businesses to create ChatBots that can handle task like administrative processes, such as managing enrollment, tracking attendance, and sending reminders. The main aims is to simplify these tasks so that both students and educators can focus more on teaching and learning. Overall, an educational-based ChatBot builder will serve as a friendly and efficient assistant, helping businesses to create ChatBots that will assist users to find information and manage administrative processes in a convenient and accessible way.

The purpose of this website will be help business make online interactions with the clients more easily. With the help of our website the Business Owners (Admin) can handle their business in a more efficient way.

1.3 Project Motivation

Nowadays, everything is evolving around technologies through which individuals/organizations are able to save time, cost, and effort of people. Education-based businesses, who have no programming experts in their companies, can build their ChatBots using built-in templates according to their requirements. And by providing them the option to integrate their desired ChatBot with WhatsApp Business. As this project is a real-time project, the motivation of the real client is that there should be a platform for small businesses to interact with their customers or clients using ChatBot.

1.4 Scope

The scope of an educational-based ChatBot builder is wide, as it aims to provide to a wide range of individuals and organizations involved in the field of education such as students, teachers, schools, and other educational organizations. The primary target audience for such a platform includes educators, students, and educational institutions.

- **Educators** can benefit from the ChatBot builder by creating interactive and engaging ChatBots to assist in classroom teaching, automate administrative tasks, and provide personalized feedback to students.

- **Educational institutions** can use this application to make their online learning platforms better. It helps them improve how they communicate with students and offer virtual support services. By using a ChatBot builder, educational institutions can create their own customized ChatBots to interact with students or clients.

  These ChatBots can simplify communication channels between students and the educational institution. Instead of waiting for an email response or making phone calls, students can simply chat with the ChatBot to get the information they need.

- **Students:** through this ChatBot Builder, ChatBots can offer virtual support services to students. They can provide guidance on various aspects of student life, such as academic advice, career counseling, or information about campus facilities. Students can access these support services anytime, anywhere, without the need for in-person interactions.

By targeting these target market in the education sector, the educational ChatBot builder can greatly change how education is done by focusing on important people involved, like teachers and students. It can make learning easier to access, more engaging, and better at helping people understand and remember information.

Chapter 2

Problem Analysis

2. Problem Analysis

A problem analysis is important because it allows individuals or organizations to understand the root causes of a particular issue or challenge. By thoroughly examining a problem, its causes, and its effects, individuals can gain a better understanding of the issue and develop effective solutions to address it. Problem analysis helps to ensure that the solutions put forth are well-informed and based on evidence, rather than assumptions or guesswork.

Problem analysis is the process of examining a situation or issue in detail to identify its root causes and potential solutions. It involves gathering information, analyzing data, and using critical thinking skills to break down complex problems into smaller, more manageable parts. By conducting a thorough problem analysis, individuals or teams can gain a deeper understanding of the issues they are facing and develop more effective strategies for addressing them. This process is often used in fields such as business, engineering, and social sciences, and can be applied to a wide range of challenges, from troubleshooting technical problems to solving complex social issues.

2.1 Existing System

Existing ChatBot builders typically utilize an interface that allows users to define the ChatBots conversation flow, create responses to user queries, and integrate with various messaging platforms. Some ChatBot builders may also include machine learning and natural language processing (NLP) technologies to improve the ChatBots ability to understand and respond to user queries. Additionally, some existing ChatBot builders may provide analytics and reporting features that help users monitor and optimize their ChatBots' performance. Overall, most ChatBot builders simplify the process of creating and deploying ChatBots, making it accessible to a wide range of people and businesses.

2.2 Drawbacks in the existing system

There are many drawbacks in the existing systems, some of which are:

1. **Limited customization:** While some applications offers various templates and design options, the level of customization is somewhat limited. Users may find it challenging to create a ChatBot that perfectly aligns with your unique branding or specific requirements.
2. **Complexity for non-technical users:** Most of the existing ChatBot builders have interfaces and functionalities that can be quite complex, especially for users without technical skills or coding knowledge. Building and configuring advanced ChatBot features might require some learning curve and technical expertise.
3. **Pricing structure:** There are many ChatBot Builders for which the pricing can be considered a drawback for some users. There are many platform's pricing plans which are relatively expensive compared to other alternatives in the market, especially if you require advanced features.
4. **Support limitations:** While some platforms may provide support options, the level of support and response time might not always meet their expectations. According to some platforms, many users have reported delays in receiving assistance or experiencing difficulties in reaching the support team.

This shows that the existing ChatBot Builders are not user-friendly, as the interfaces might be quite complex, making it harder for the users to understand, especially if there from a non-technical background, so overall the systems are highly ineffective.

2.3 Proposed System

Our proposed system is a website that will help the company with several benefits and support them reach their motive to help businesses grow.

Our System will provide an easy to use interface, which is not so complex, so the users will understand how the system works. Through this system users will be able to login and create a ChatBot according to their own business they can also use the template that we provide them or customize their own. We will also provide a voice recognition system in this ChatBot builder that hasn't been used in any existing Systems.

Using our system, businesses can save valuable time and resources by offering their services online through the ChatBot. The system will be designed in a way that is easy to use, ensuring that users can quickly understand how it works and make the most of its benefits.

2.4 System Modules

This application has the following modules:

- Voice Recognition
- Integration

1. **Voice Recognition**

   In this module we will include a voice recognition system through which developers can create ChatBots that can interact with users through voice commands or spoken language. This can provide a more natural and convenient way for users to interact with ChatBots, especially in situations where typing may not be feasible or practical.

2. **Integration**

   ChatBots may need to integrate with other platforms, in our case WhatsApp Business. Integration modules help to facilitate these connections and allow the ChatBot to access and manipulate data from these systems.

2.5 Stakeholders

Stakeholders are individuals, groups, or organizations that are actively involved in a software project, can influence it due to their position, and whose interests may be affected by the success or failure of the project.

- End Users

- Business Owners

2.6 Actor Goal List

2.6.1 Business Owners

Business owners, in the field of education, are the individuals who will ultimately benefit from the ChatBot. They have a critical role in ensuring that the ChatBot is aligned with business goals and objectives. Some of their key responsibilities include:

1. **Defining the business case for the ChatBot**

   Business owners are responsible for defining the business case for the ChatBot.

2. **Allocating resources**

   Business owners are responsible for allocating the necessary resources, including time, budget, and personnel, to develop and maintain the ChatBot.

3. **Providing feedback**

   Business owners provide feedback on the ChatBot's functionality, performance, and user experience.

4. **Promoting the ChatBot**

   Business owners promote the ChatBot to their target audience, ensuring that it reaches its intended users and generates the desired benefits.

2.6.2 End-Users

End-Users are individuals who will interact with the ChatBot. They could be customers, clients, or users of a particular service.

End-users interact with the ChatBot, and their responsibilities can vary depending on how the Business Owner has designed the ChatBot. For example, if the ChatBot is designed to provide customer support, the end-user's responsibility may be to ask questions, provide feedback, or report issues.

In general, end-users have the following responsibilities:

1. **Engage with the ChatBot**

   End-users are responsible for starting and maintaining a conversation with the ChatBot. They should provide clear and concise input and respond to the ChatBots prompts and questions appropriately.

2. **Provide feedback**

   End-users can provide feedback on the ChatBots performance, accuracy, and usefulness. This feedback can help developers improve the ChatBots functionality and user experience.

3. **Follow guidelines**

   End-users should follow any guidelines or instructions provided by the ChatBot to ensure that their interactions with the ChatBot are effective and efficient.

4. **Protect their privacy**

   End-users should protect their personal information and data when interacting with the ChatBot. They should be aware of the data privacy policies and practices of the ChatBot and only provide the necessary information.

5. **Report issues**

   End-users should report any issues or problems they encounter while using the ChatBot. This feedback can help developers identify and resolve bugs and errors.

Overall, end-users, the people who use the ChatBot, are very important for making it successful. They can help by talking to the ChatBot, by engaging with the ChatBot, providing feedback, and following guidelines, end-users can help ensure that the ChatBot meets their needs and provides a valuable service.

Chapter 3

System Analysis

3. System Analysis

System analysis is a process that connects the requirements of a system with the design of the software. It involves gathering and analyzing information about the system's needs and constraints, and then using that information to create a plan for how the software will be developed. The goal is to create a document that outlines the system's requirements and how they will be met through software design. This chapter helps ensure that the software meets the needs of the system and its users.

3.1 Problem Overview

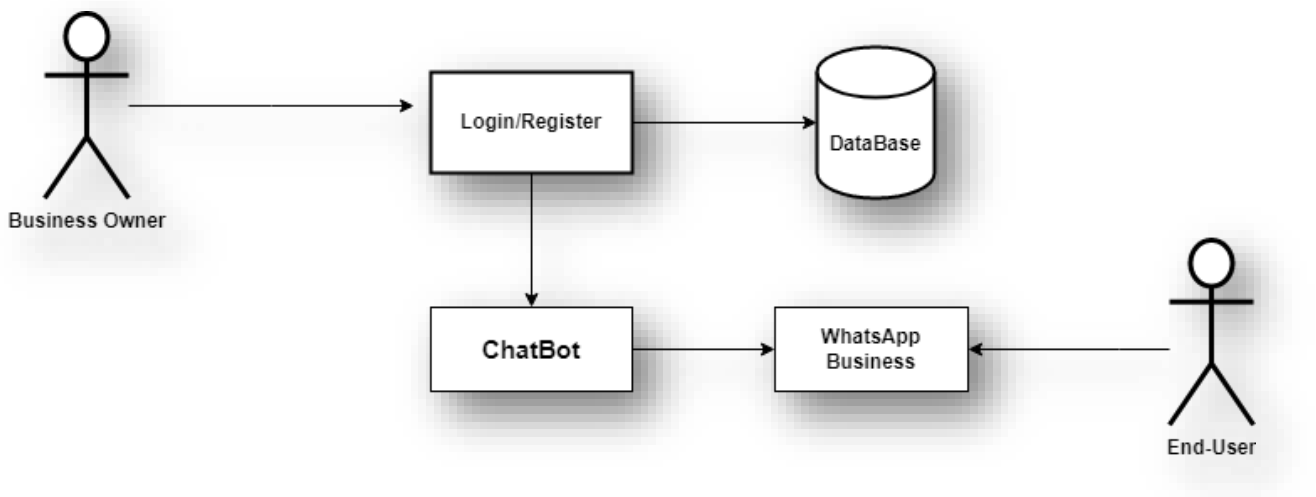

Figure 3.1 Problem Overview

3.2 Specific Requirements

Specific requirements are categorized as functional and non-functional requirements and discussed below.

3.2.1 Functional Requirements

Functional requirements are the requirements that a system should perform. Software Module is the subunits of a system called modules that are designed and developed according to the user's requirements and priority.

Following are the modules of ChatBot Builder:

BUSINESS OWNER (ADMIN)

3.2.1.1 Register User

If a user is new to the system, then he/she has to register himself to the system by providing the necessary information.

3.2.1.2 Sign in

User can log in to the system through an already registered account by providing credentials.

3.2.1.3 ChatBot Creation

Users should be able to easily create and design ChatBots using a visual interface or a drag-and-drop builder.

3.2.1.4 Integration

The ability to integrate the ChatBot with WhatsApp Business is essential. This allows users to reach their audience through WhatsApp Business.

3.2.1.5 Customer Support

Through this module, the users will have the chance to drop down any queries or feedback that they might have regarding the ChatBot Builder.

3.2.1.6 Sign out

Users can simply log out from the system by simply clicking on the logout button.

END-USERS

3.2.1.7 Ask Queries

The End-User can be a student, customer, educator or any type of client that can come and ask queries related to that specific business, it can be questions related to administrative process, courses information as in what type of courses has the organization offered etc.

3.2.2 Non Functional Requirements

Non-functional requirements specify the characteristics and constraints that define how a system should behave rather than what it should do. They describe the overall behavior, performance, security, usability, and other aspects of the system. Non-functional requirements are essential for ensuring that the system meets the desired levels of reliability, efficiency, maintainability, and user satisfaction.

So to implement the ChatBot Builder we need to consider the following Non-Functional requirements:

3.2.2.1 Security

Security is the top priority for our system, as it ensures that the system is protected from any harmful attacks. Our system will contain the details such as data about the users.

So to prevent harmful attacks in our system, we have implemented two important security measures:

1) **Authentication**

   Authentication ensures that only registered individuals can access and use the system. It verifies the identity of the person trying to log in and ensures they are who they claim to be.

2) **Authorization.**

   Authorization, on the other hand, determines the level of access and permissions granted to a user once they are authenticated. It is based on the user's role or position within the system.

3.2.2.2 Reliable

System Reliability refers to the amount of time the system can operate without experiencing failures. Reliability is measured by how long the system can successfully work over a long period of time without any issues.

We will provide a **comprehensive documentation and support resources** for users and we will also encourage users to **provide feedback on the systems performance** and use that feedback to improve its capabilities.

3.2.2.3 User-Friendly

A user-friendly education-based ChatBot builder allows users to create and personalize ChatBots without needing to know a lot about technology or coding.

So a user-friendly Educational-Based ChatBot builder is important because it popularizes the creation of ChatBots, saves time, promotes collaboration, fosters inclusivity, and facilitates continuous improvement in education.

We will make a **Simple and Innovative Interface** that allows users to easily navigate and understand the ChatBot builder and we will also **provide templates**.

3.2.2.4 Performance

Performance refers to how fast a software system or a particular part of it responds when users interact with it.

Overall, performance is essential in an educational-based ChatBot builder as it directly influences user engagement, content effectiveness, scalability, accessibility, reliability, and trustworthiness.

We will use **lightweight frameworks or libraries** that offer better performance. We will also use **efficient data storage** that offer faster read/write operations.

3.2.2.5 Availability

Availability means how often the system is reachable and serviceable to the user. The system should be available to those clients or users who are related to a company within the education field only then they can access and create a ChatBot.

To achieve this, we are planning to Offer **24/7 support** to address any user concerns or technical issues promptly.

3.2.2.6 Usability

Achieving usability on our Educational-based ChatBot Builder basically involves focusing on the needs and expectations of the users that can either educators, students, or possibly administrators.

We can achieve this by making a **User-Centered Design** through conducting user research to understand the target audience's needs, goals, and preferences. And we can also achieve this by **Accessibility Considerations** which basically means that we will ensure that our system is usable for individuals with disabilities.

3.3 Use Case

A use case is an analysis methodology of a system to identify, clarify the system requirements. Every use case describes the functionality and each use case has some associated events initiated by an actor. Each use case describes the interaction between system and actor. A use case is a collection of all the possible interaction sequences to identify and organize the system requirements.

The use cases are considered complete when all the goals have been included and satisfied. A use case has the following features:

- It models the goals of user \/ system interactions into a single diagram.
- It organizes the functional requirements.
- It records the path from the trigger (event or user) to the goals. (Contributor, 2020)

The main features of the use case diagram are as follows:

- Identify actors (users) of the system.
- For each actor, it defines roles played relevant to the system.

Identifying the Actors

Actors are the users that have interactions with the system. Something that interacts with the system is identified as an actor.

Identifying the Use Cases

The use case describes how the actor will work with the system and how the system will be used by the actor.

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3.3.1 Use Case Diagram for ChatBot Builder

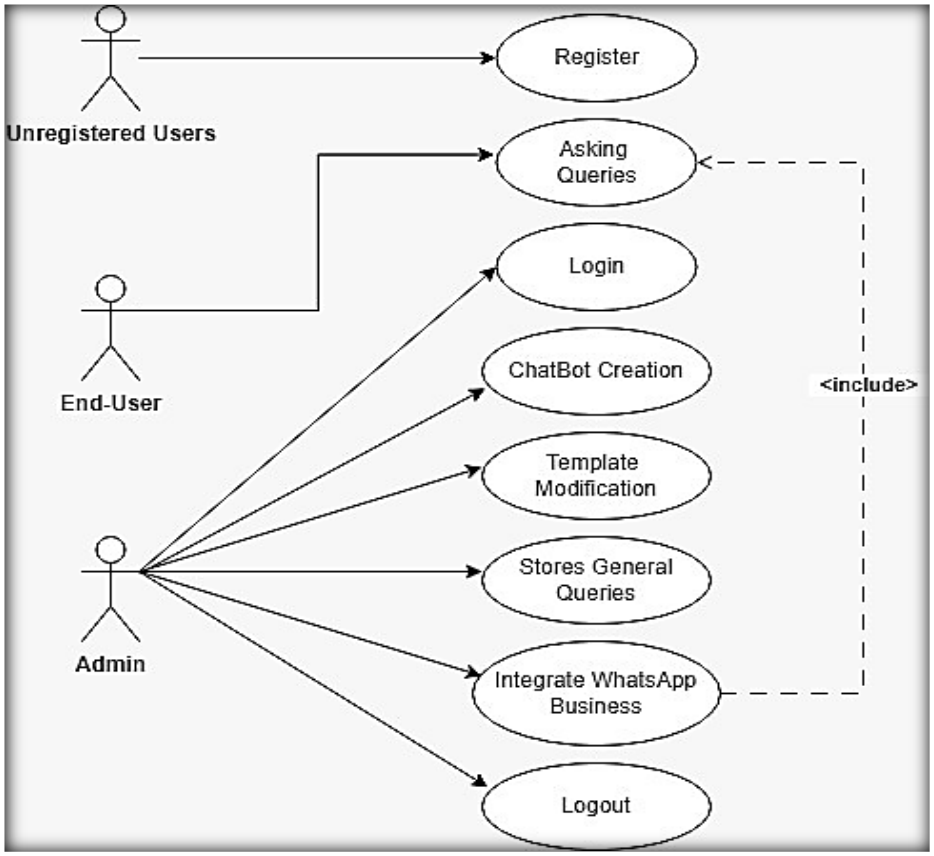

Figure 3.3.1 1 Use Case Diagram for ChatBot Builder

In the above use case diagram, there are three actors named unregistered users, End-User and Admin. There are a total of **eight use cases** that represent the specific functionality of our Educational-Based ChatBot builder. Each actor interacts with a particular use case. The **unregistered user** basically just registers themselves on the system. This actor can only have this interaction with the system as it is required.

The 2nd actor named **End-User** can only ask queries, through WhatsApp Business, with the ChatBot that has been created using our system. This actor can perform only this interactions with the system even though other use cases are remaining in the system.

The 3rd actor named **Admin** can interact with all the functionalities or use cases of the system. This actor can also create or use the pre-built templates to create a ChatBot and integrate it to WhatsApp Business through which the ChatBot interacts with the End-User. These interactions of both **End-User and the Admin** actor together sums up the entire ChatBot Builder application

3.3.2 Use Case in Descriptive Form (Fully Dressed Use Case):

3.3.2.1 Sign up

UC-01	
Scope	ChatBot
Primary Actor	Client
Stakeholders & Interests	The client wants to Sign Up to access the system.
Pre Conditions	The client is not signing up from an already existing account
Post Conditions	The client signed up successfully and the dashboard is shown.
Main Success Scenario	
Actor	**System**
1) The clients select the "ChatBot" option. 2) The client enters the required credentials.	**1.1** The system shows the signup interface. **2.1** The system verifies the entered information. **2.2** If the information is correct, the system successfully signup the client. **2.3** If the information is not correct, the system displays the error message.
Alternate Scenario	The system fails to validate the information.

Table 3.3.2.1 Use case for Sign Up

3.3.2.2 Sign in

UC-02	
Scope	ChatBot
Primary Actor	Client, Admin
Stakeholders & Interests	The user wants to Sign In to access the system.
Pre Conditions	The client is not signing up from a non-existing account.
Post Conditions	The client signed in successfully and the home screen is shown.
Main Success Scenario	
Actor	**System**
1. The user selects the "Sign In "option. 2. The client enters the required credentials and submits.	**1.1** The system shows the sign-in form to the client. **2.1** The system validates the entered information and displays the main screen else display the error message.
Alternate Scenario	If the email or password is incorrect, the user would not be able to sign in.

Table 3.3.2.2 Use Case for Sign In

3.3.2.3 Admin Provides Details

UC-03	
Scope	ChatBot
Primary Actor	Admin
Stakeholders & Interests	The admin provides details to the system.
Pre Conditions	Admin is signed in.
Post Conditions	The admin provided requirements and specifications successfully. Added details are saved in the backend repository.
Main Success Scenario	
Actor	**System**
1. The admin selects the "Create ChatBot"option. **2.** The admin enters the required field andsubmit to system.	**1.1** The system shows an interface **2.1** The system validates the fields and save the information in the database **2.2** The system shows the success message.
Alternate Scenario	If required input fields are empty, the admin would not be able to move further.

Table 3.3.2.3 Use case for providing details

3.3.2.4 Admin Manages Template

UC-04	
Scope	ChatBot
Primary Actor	Admin
Stakeholders & Interests	The admin needs to manage templates.
Pre Conditions	Admin is signed in.
Post Conditions	The admin modified templates successfully. Modified Templates are saved in the backend repository.
Main Success Scenario	
Actor	**System**
1. The admin selects the "Modify Template" option. **2.** The admin enters the required field and submit to system. **3.** The admin selects the edit option to edit the template details. **4.** Admin makes changes to the request details.	**1.1** The system shows the result of request interface. **2.1** The system validates the fields and save the information in the database **2.2** The system shows the success message. **3.1** The system shows the update request interface. **4.1** The system validates the fields and save changes to the database. **4.2** The system shows the view requests result interface.
Alternate Scenario	If required input fields are empty, the admin would not be able to make changes.

Table 3.3.2.4 Use case for Managing Template

3.3.2.5 Admin Creates ChatBot

UC-05	
Scope	ChatBot
Primary Actor	Admin
Stakeholders & Interests	Admin needs to create ChatBot.
Pre Conditions	Admin is signed in.
Post Conditions	The ChatBot is created successfully.
Main Success Scenario	
Actor	**System**
1. Admin selects the "create ChatBot" option from the main screen.	**1.1** The system shows the ChatBot created.
Alternate Scenario	The ChatBot is not created.

Table 3.2.2.5 Use case for Creating ChatBot

3.3.2.6 Admin Integrating With WhatsApp Business

UC-06	
Scope	ChatBot
Primary Actor	Admin
Stakeholders & Interests	Admin needs to Integrate ChatBot to WhatsApp Business
Pre Conditions	Admin is signed in.
Post Conditions	Integration of ChatBot on WhatsApp Business is successful.
Main Success Scenario	
Actor	**System**
1. Admin creates an account of WhatsApp Business. 2. Admin Designs ChatBot Flows	**1.1** The System enables API access. **2.1.** System defines specific responses and deploys ChatBot to WhatsApp Business
Alternate Scenario	The Integration is not successfully done.

Table 3.3.2.7 Use case for Integrating ChatBot

3.3.2.7 End-User Finds ChatBot

UC-07	
Scope	ChatBot
Primary Actor	End-User
Stakeholders & Interests	The End-User interacts with ChatBot for details.
Pre Conditions	The End-User has WhatsApp Business
Post Conditions	The End-User finds the ChatBot successfully.
Main Success Scenario	
Actor	**System**
1. The End-User asks queries .to the ChatBot	**1.1** The system responds to the query with a relevant answer
Alternate Scenario	The ChatBot gives inaccurate information to the End-User

Table 3.3.2.7 Use case for Find ChatBot

3.3.2.8 Help

UC-08	
Scope	ChatBot
Primary Actor	Admin
Stakeholders & Interests	The Admin wants to get help with using the system.
Pre Conditions	The Admin is signed in.
Post Conditions	The Admin help module is displayed to the client.
Main Success Scenario	
Actor	**System**
1. The Admin selects the "Customer Support" option. **2.** The Admin asks for guidance	**1.1** The system displays the interface **2.1** The system responds
Alternate Scenario	Help page not shown.

Table 3.3.2.18 Use case for Help

3.3.2.9 Logout

UC-09	
Scope	ChatBot
Primary Actor	Client
Stakeholders & Interests	The client wants to log out from the portal.
Pre Conditions	The client is signed in.
Post Conditions	The client is logout successfully.
Main Success Scenario	
Actor	**System**
1. The client selects the "Logout" option.	**1.1** The system logout the user from the system. **1.2** The system redirects the client to the login interface.
Alternate Scenario	The client is already Logged out.

Table 3.3.2.19 Use case for Logout

Chapter 4
System Design

4. System Design

System Design is the process of designing and defining the interfaces, components, modules, and data for a product to fulfill specific requirements. It is said as a process of system theory to product development. Designing is the very initial step in the software development life cycle phases for any product. Once the system requirement has been specified, system design is the first step in technical events i.e. designs, code, and test. The system design provides a technical representation of the software to assess quality. Designing software helps in accurately translating user's requirements into a developed product.

4.1 Sequence Diagram

4.1.1. ChatBot Builder

4.1.1.1. Sign Up

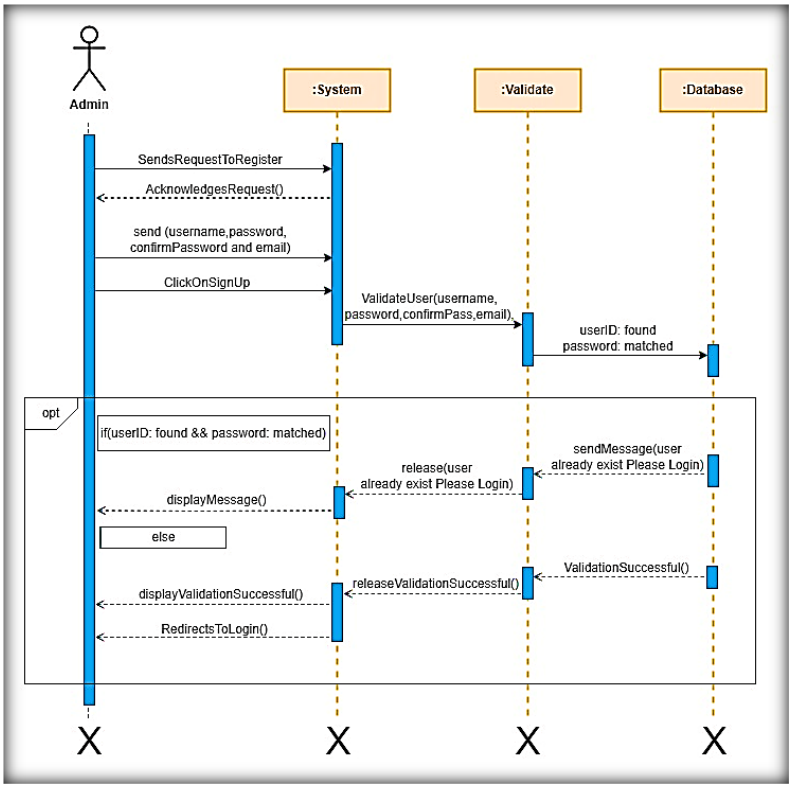

Figure 4.1.1.1 Sequence Diagram Sign Up

The above Figure 4.1.1.1 shows the Sequence Diagram for Sign Up.
This diagram illustrates the steps to how user creates an account to access the system

4.1.1.2. Login

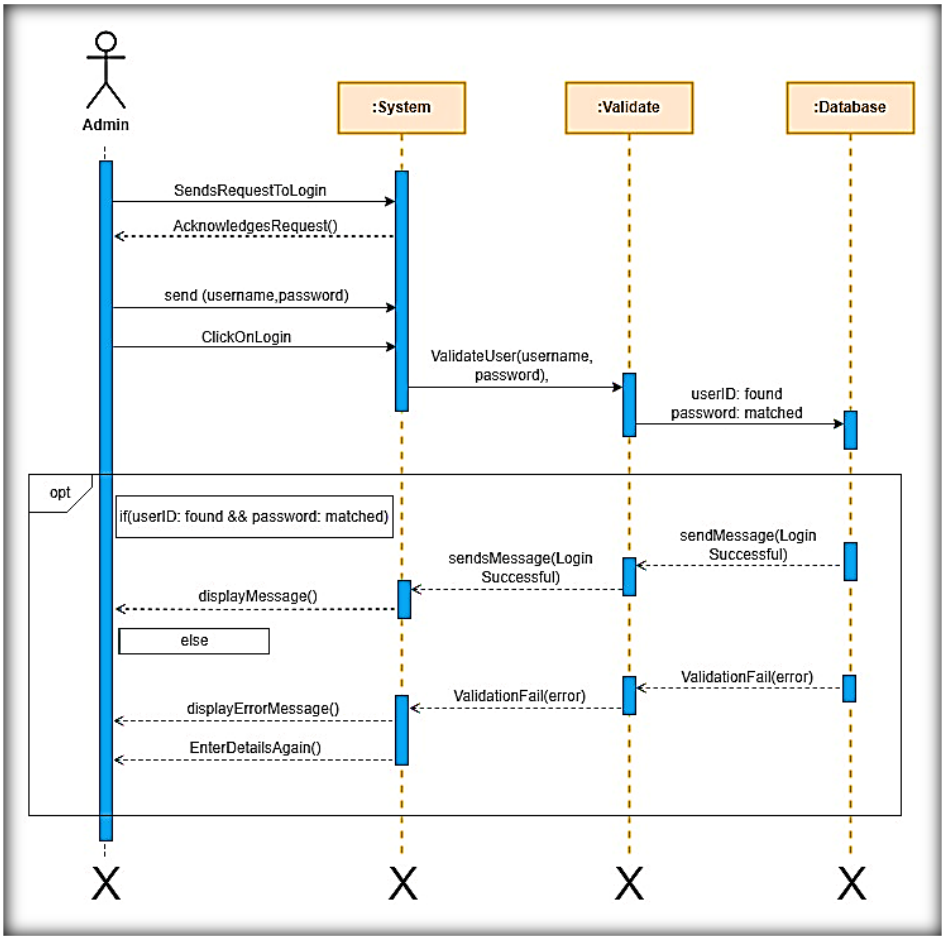

Figure 4.1.1.2 Sequence Diagram Login

The above Figure 4.1.1.2 shows the sequence diagram for Login.
This diagram illustrates how the user will be given access to the system. If userID is found and the password is matched, the user will be given access to the system but if the details don't match the user will be asked to enter details again.

4.1.1.3. Admin Modifies Template

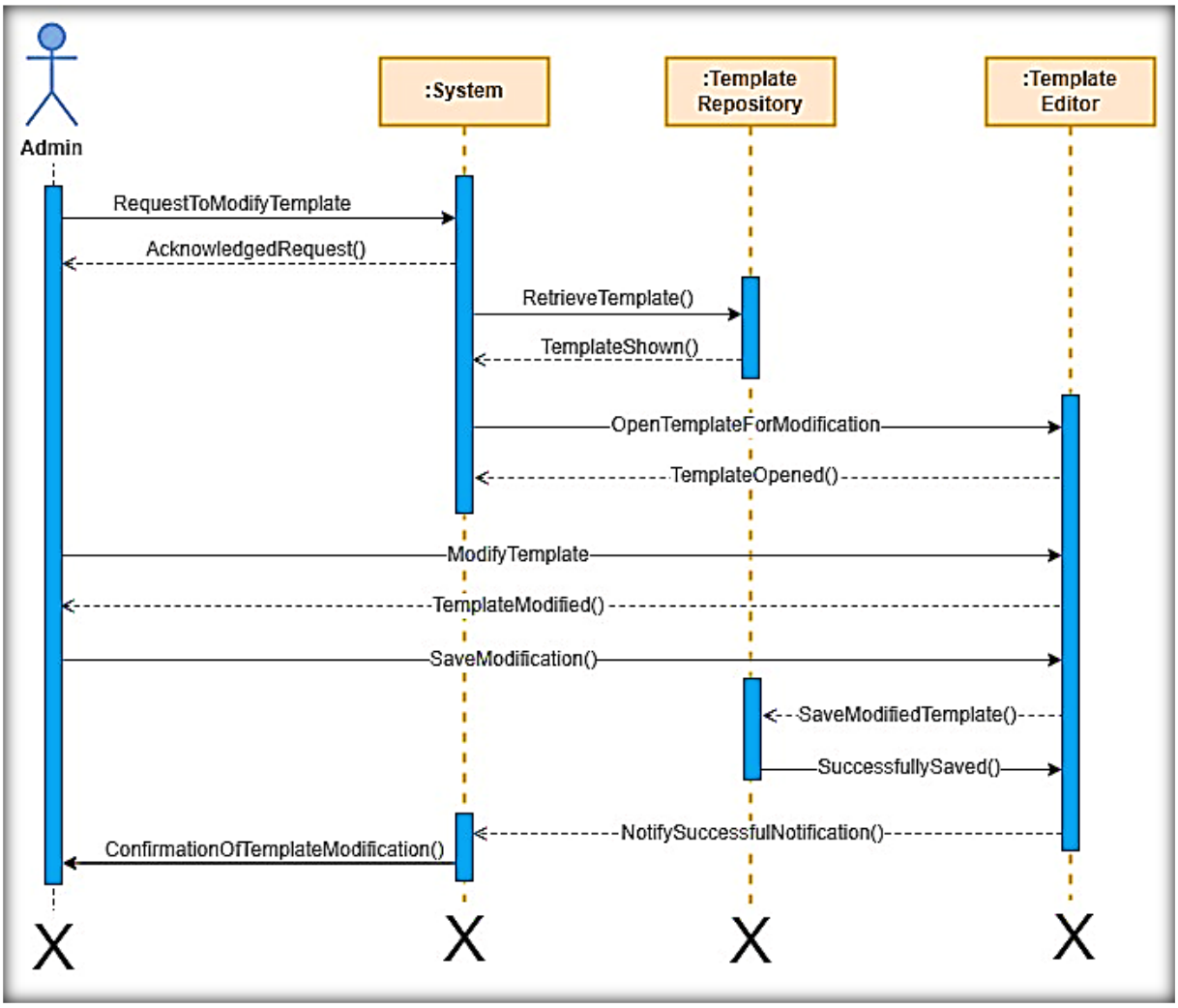

Figure 4.1.1.31 Sequence Diagram for Template Modification

The above diagram illustrates how the Admin, as in the Business Owner, can modify the template to make a ChatBot.

The **Admin** will first send a request to the system for the template modification, once **the system** acknowledges the request it will allow the **Admin** to select a template from the **template repository**, a page where the templates will be shown, once the Admin selects the template for modification the system will redirect the Admin to the **Template Editor**. Through this the Admin will be able to modify the template according to its own needs and requirements.
Once the template is modified, **Admin** will save the template and can use that to create its ChatBot.

4.1.1.4. Admin Create ChatBot

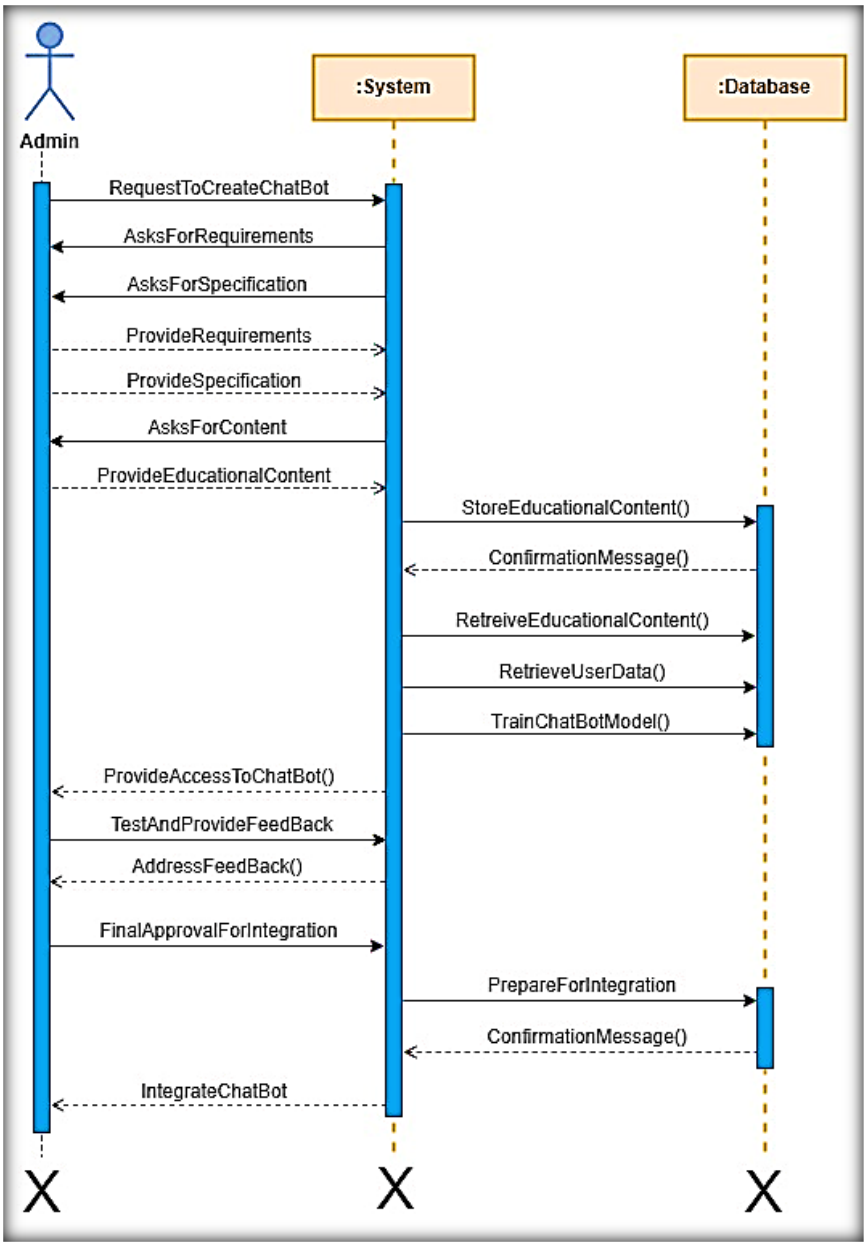

Figure 4.1.1.4 Sequence Diagram Integration of ChatBot

This sequence diagram outlines the main steps involved in creating and interacting with a ChatBot through our System.

It starts with the **Admin** requesting the creation of a ChatBot and progresses through training the ChatBot, through the requirements and specifications given by the Admin. **The system** will then provide access to the trained ChatBot so that the Admin can test ad approve the final ChatBot, through which the Admin can then integrate it to WhatsApp business

4.1.1.5. Admin Registering on WhatsApp Business

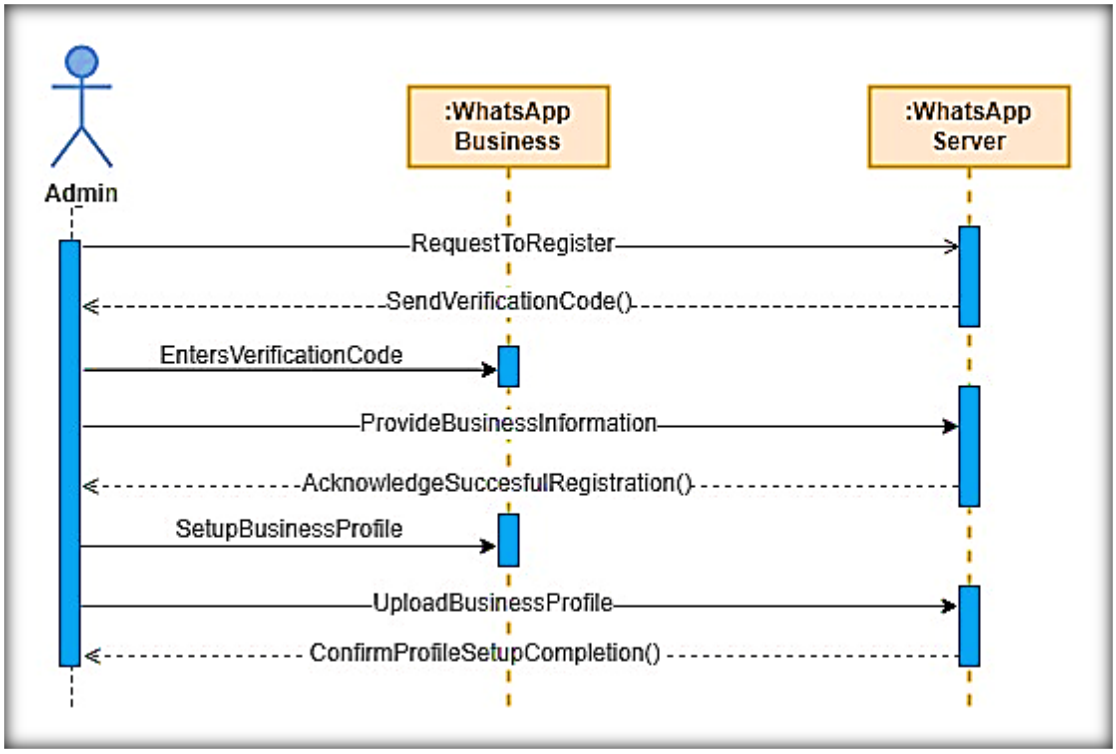

Figure 4.1.1.62Registering WhatsApp Business

The above Sequence Diagram is the representation of how the WhatsApp Business account will be created.

The diagram starts off by the **Admin** sending request to register on **WhatsApp Business**. The **WhatsApp server** responds by sending a verification code to the Admin. The **Admin** will then enters the verification code into the WhatsApp Business app. The **Admin** will provide necessary business information to the **WhatsApp server**, through which the server acknowledges the successful registration to the **Admin**.
Admin will set up the business profile within the WhatsApp Business app, and the
Admin will also upload the business profile to the **WhatsApp server** and the **server** will confirm the completion of the profile setup to the Admin.

4.1.1.6. Integration of ChatBot

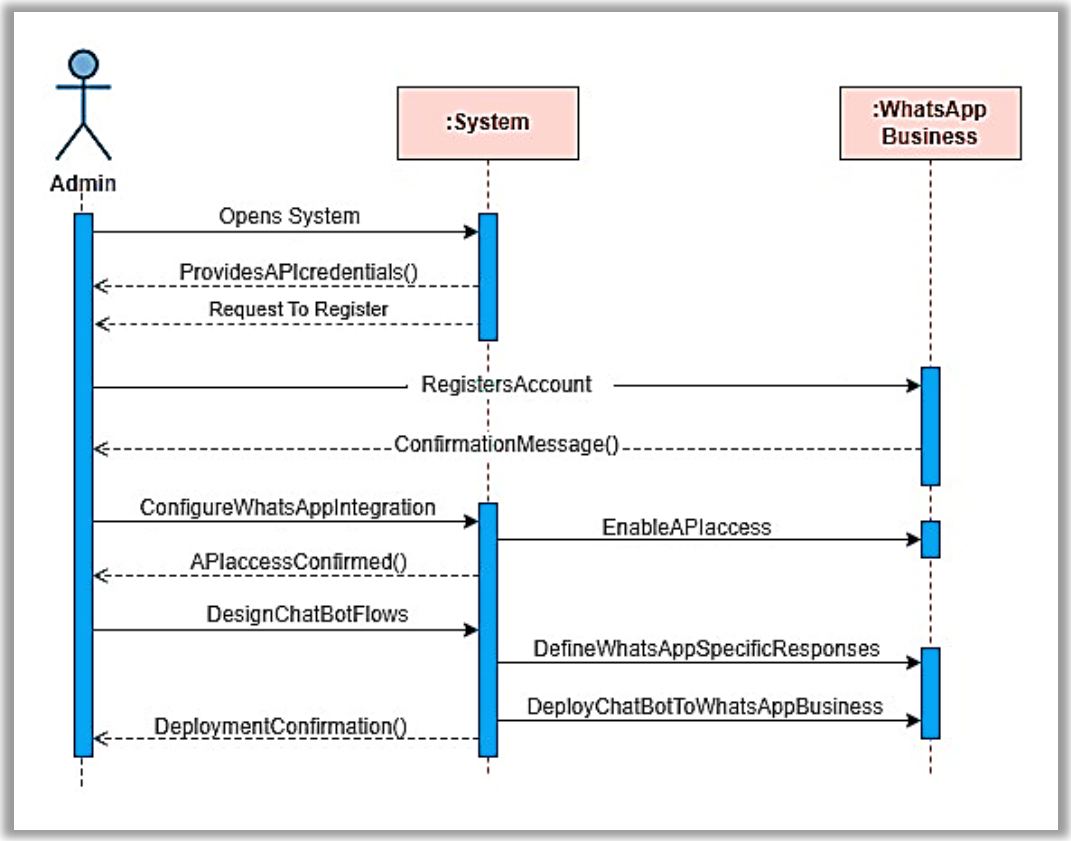

Figure 4.1.1.6 Sequence Diagram Integration of ChatBot

The above Figure shows the sequence of how the ChatBot will be integrated with WhatsApp Business.

The **Admin (Business Owner)** will login to our application, through which our **system** will provide them with an API key that will be required for Integrating with WhatsApp Business. The **system** will send request to make an account, through which, **the Admin**, as in the Business Owner, will then register an account with **WhatsApp Business** using the provided API credentials.

WhatsApp Business will then send a confirmation message to the Admin to verify the account. The **Admin** will then configures the WhatsApp integration settings on our application, providing necessary information like phone number etc. The **system** enables API access to communicate with WhatsApp Business on behalf of the Admin. The **system** will confirms API access and the **Admin** will create the ChatBot using the applications interface.
Our **System** allows the **Admin** to define WhatsApp-specific responses, considering the limitations and features of the WhatsApp platform.
Our **System** will then integrate the configured ChatBot to WhatsApp Business, connecting the designed ChatBot flows with the **WhatsApp integration**.
The **system** notifies the Admin about the successful deployment of the ChatBot to WhatsApp Business.

4.1.1.7. End-User Interacting with ChatBot

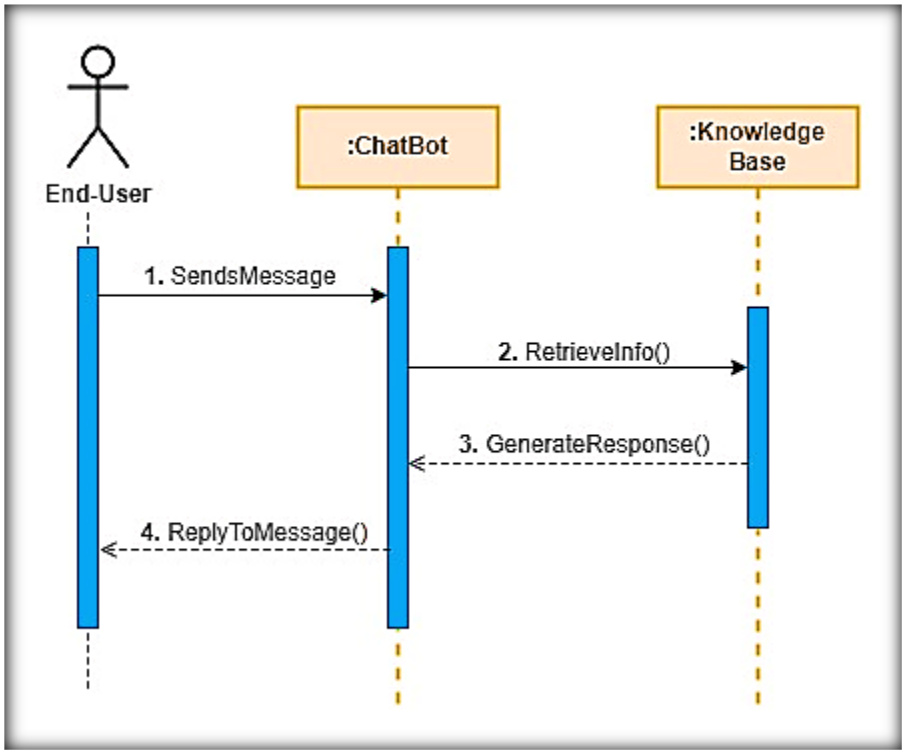

Figure 3.1.1.7 Interaction with ChatBot

The above Figure shows the sequence of how the End-User will interact with the ChatBot created from the system.

The **End-User** starts the conversation by sending a message or query to the **ChatBot**. The **ChatBot** receives the message and the backend of the ChatBot prepares to process it. The ChatBot analyzes the **End-User's** message, this may involve natural language processing (NLP) techniques to understand the intent and extract relevant information. Based on the user's input, the **ChatBot queries a knowledge base** or database through which using the retrieved information, the ChatBot generates a response to answer the user's query. **The ChatBot** sends the response back to the user and the **End-User** receives the response. If the **End-User** has additional queries or requests, they can continue the conversation by sending another message, starting the interaction loop again.

4.2 Class Diagram

Class Diagram is the structure diagram to show the structure of the system. This diagram represents the system in classes, data elements, operations and relationships with other classes. It shows the general conceptual model of the system and can be easily mapped to object oriented approach in the developing phase. The class diagram for Educational-Based ChatBot Builder:

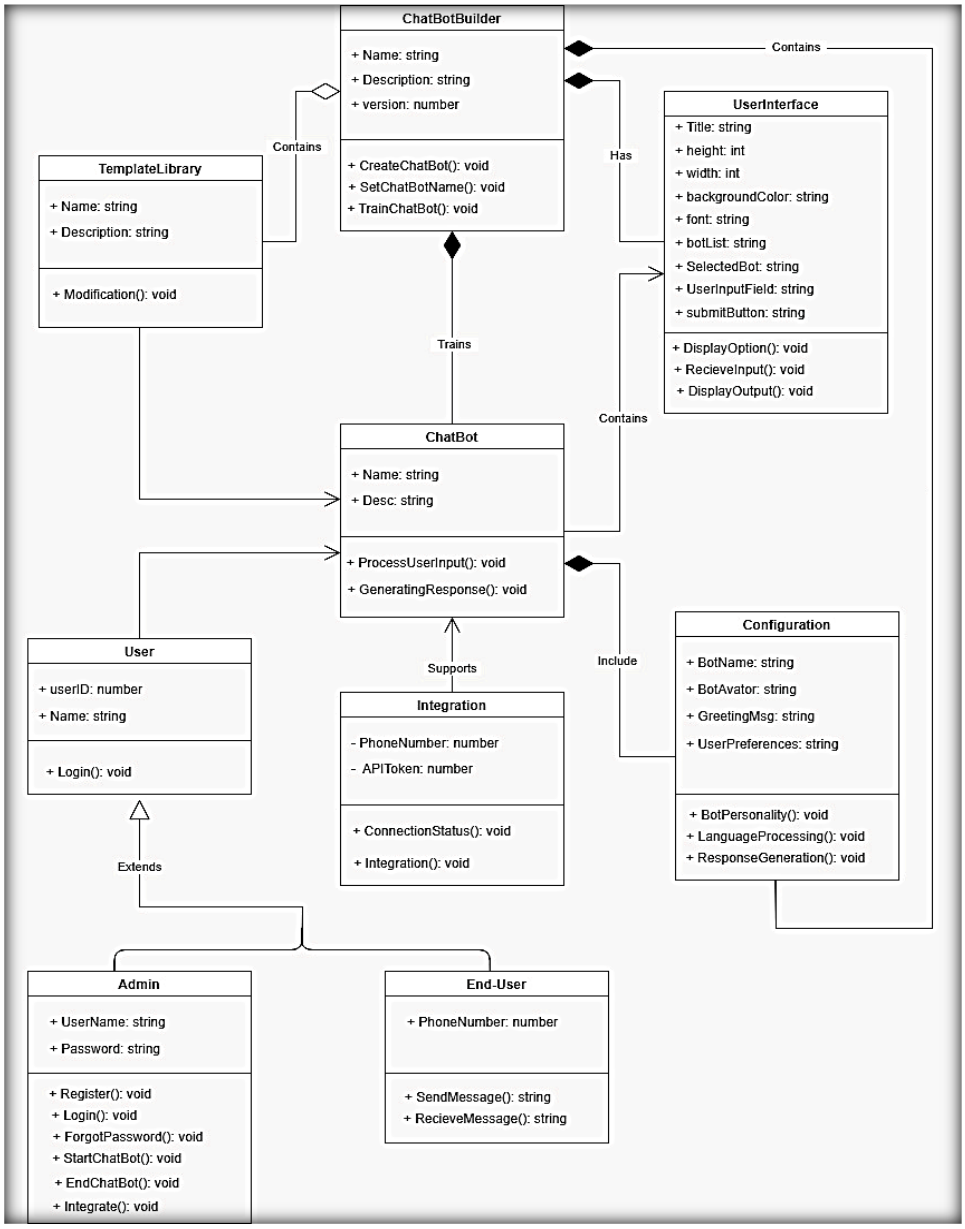

Figure 4.2 Class Diagram for Class Diagram

4.3 Entity Relationship Diagram

Entity Relationship Diagram or ER model is a structural diagram to describe entities within the scope and relationship among these entities. ERD is used for purpose of drawing the database in a visual form. (Nishadha, 2021) ERD represents the entities with their attributes and defines relationship with entities using the symbols. The ERD of Educational-Based ChatBot Builder is normalized to 3rd normal form.

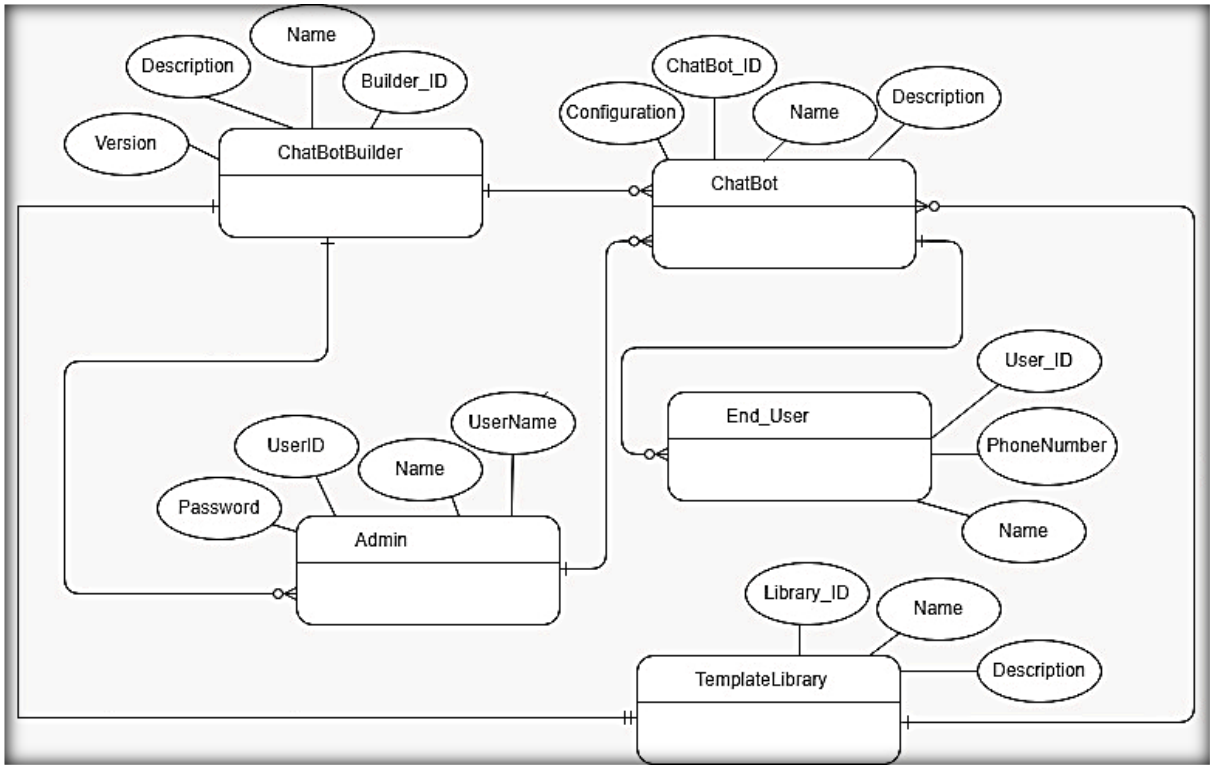

Figure 4.4 Entity Relationship Diagram for Educational-Based ChatBot Builder