1. INTRODUCTION

1.1. MOTIVATION:

Today, enterprises are revamping their existing channels, such as contact centres based on interactive voice response (IVR), to provide an enhanced, seamless experience to customers. They are motivated to create an omni-channel experience, using services like Amazon Lex to enrich customer experience at a low cost. They are also using channels like WhatsApp, a popular communication choice. With the introduction of the WhatsApp API for business, enterprises engage with customers through WhatsApp for text communication to increase reachability. This post outlines steps for enhancing the customer experience by linking WhatsApp with Amazon Lex for text. It then links with an Amazon Connect contact centre for seamless voice transfer using the Amazon Connect API and the Twilio WhatsApp API.

1.2. PROJECT DEFINATION:

Chatbots are intelligent conversational computer programs that mimic human conversation in its natural form. A chatbot can process user input and produce an output. Usually, chatbots take natural language text as input, and the output should be the most relevant output to the user input sentence. Chatbots can also be defined as “online human-computer dialogue system(s) with natural language”. Chatbots constitute therefore an automated dialogue system, that can attend to thousands of potential users at once.

1.3. PROJECT OBJECTIVE:

By the end of this we will be able to, Work with Amazon Lex Service, Create Intents, create slots, create slot types, understand core concepts and terminologies of LEX, Integrate Chatbot with WhatsApp.

1.4. LIMITATIONS OF THE PROJECT:

It will work in all conditions but in some conditions, it may not give correct output. And all the data must be updated in regular period of time so that the output can be accurate.

2. PROBLEM STATEMENT

2.1. EXISTING PROBLEM

In the current era the orders and reservations are taking place via placing call, where all people don’t know the language with respect to the agent of the restaurant. And multiple reservations take much time. Amazon Lex is a service for building conversational interfaces into any application using voice and text. You can add a voice or text chat interface to create bots on any application that helps customers with many basic tasks. Twilio and WhatsApp are third-party services subject to additional terms and charges. Amazon Web Services isn’t responsible for any third-party service that you use to send messages. With chatbots, a single bot instance can handle multiple instances of human interactions and hence reduces the need for manpower substantially.

3. LITERATURE SURVEY

3.1. INTRODUCTION:

In this section we outline the following main aspects of chatbots based on our finding from the literature review: implementation approaches, available public database used in previous data-driven approaches to chatbot implementation, the main evaluation methods for measuring the performance of chatbots and the application of chatbots in the domain of WhatsApp.

3.2. DISADVANTAGES OF EXISTING SYSTEM:

- Collecting large amount of data.
- Multiple orders can't be placed from different users at a time.
- Handling individual customer queries on a large scale requires huge manpower, and that brings its costs along with.

3.3. PROPOSED SYSTEM:

A chatbot is a computer program that uses artificial intelligence (AI) and natural language processing (NLP) to understand customer questions and automate responses to them, simulating human conversation. Amazon Lex is a service for building conversational interfaces into any application using voice and text. You can add a voice or text chat interface to create bots on any application that helps customers with many basic tasks. We will be able to, Work with Amazon Lex Service, Create Intents, create slots, create slot types, understand core concepts and terminologies of LEX, Integrate Chatbot with WhatsApp.

To accomplish this, we have to complete all the activities and tasks listed below:

1. Prerequisite Functions.
2. Create AWS account.
3. Create custom Bot.
4. Launch AWS Lex service.
5. Create a Custom Bot.
6. Create Intents and Slot types.
7. Create Greetings, Menu, Order, Table Reservation Intents.
8. Build and Test Bot.
9. Integrate Bot with WhatsApp and publish the Bot.
10. Create a Twilio account and publish the Bot in Twilio Account.
11. Join WhatsApp and Test the App.

4. EXPERIMENTAL ANALYSIS

Mile Stone 1: Create AWS account:

- Sign in to Aws Account.
- Launch Lex Service.
- Create Custom Bot.

Mile Stone 2: Create Intents and Slot Types:

- Create Greetings Intent.
- Configure General Greetings Intent.
- Build and Test the Bot.
- create Restaurant menu Intent.
- Configure RestaurantMenu Intent.
- Test the Bot.
- Add Restaurant Order Intent.
- Build and Test the Bot.
- Add an intent to reserve a table, Test the Bot.
- Add Thankyou Intent.

Mile Stone 3: Integrate Bot with WhatsApp:

- We can integrate our bot with any of the channels mentioned below:
    1. Facebook.
    2. Twilio.
    3. Slack.
    4. WhatsApp (We will be using Twilio to integrate our bot with WhatsApp).

- To accomplish the above task, we have to first
    1. Publish the Bot.
    2. Add channel.
    3. Integrate with channel.

4.1. PROJECT ARCHITECTURE:

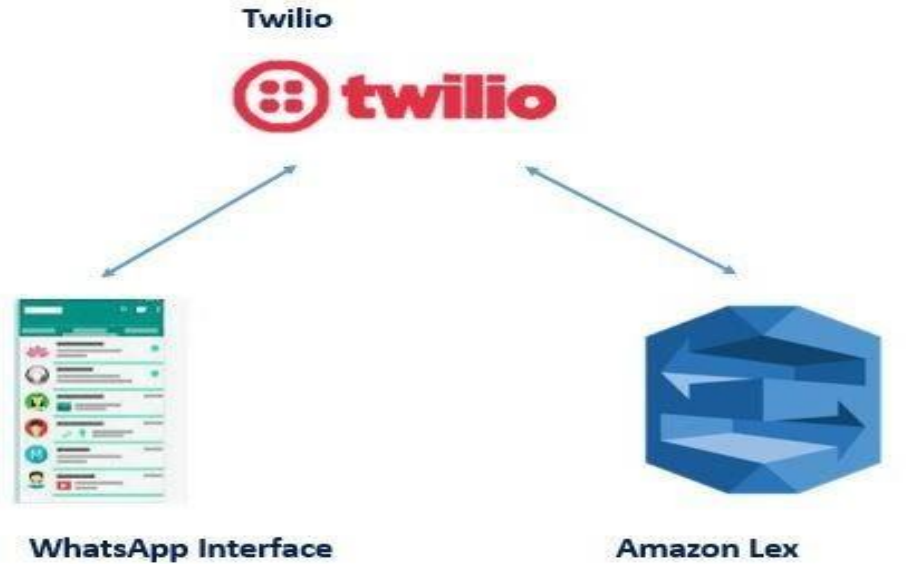

Fig.1. Architecture

4.2. SOFTWARE AND HARDWARE REQUIREMENTS:

SOFTWARE REQUIREMENTS:

- **AWS (AMAZON WEB SERVICE):**

Amazon Web Services (AWS) is a subsidiary of Amazon that provides on-demand cloud computing platforms to individuals, companies and governments, on a paid subscription basis. The technology allows subscribers to have at their disposal a virtual cluster of computers, available all the time, through the Internet.

- **AMAZON LEX:**

Amazon Lex is an AWS service for building conversational interfaces for applications using voice and text. With Amazon Lex, the same conversational engine that powers Amazon Alexa is now available to any developer, enabling you to build sophisticated, natural language chatbots into your new and existing applications. Amazon Lex provides the deep functionality and flexibility of natural language understanding (NLU) and automatic speech recognition (ASR) so you can build highly engaging user experiences with lifelike, conversational interactions, and create new categories of products. Amazon Lex enables any developer to build conversational chatbots quickly. With Amazon Lex, no deep learning expertise is necessary to create a bot, you just specify the basic conversation flow in the Amazon Lex console.

- **TWILIO:**

Twilio is a cloud communications platform as a service company based in San Francisco, California. As of July 2022, Twilio has a market cap of $15.71 Billion. Twilio's products are used by major companies such as Uber, Airbnb, Netflix, and HubSpot. Twilio offers developers a platform for building voice, video and messaging applications. The platform consists of a set of Application Programming Interfaces (APIs) that enables developers to make and receive voice and video calls, send and receive SMS, WhatsApp, and email, and perform other communication functions using its web service APIs.Twilio is built almost entirely on a pay-as-you-go pricing model, and its wide range of APIs enables developers to integrate Twilio into their applications.

- **WHATSAPP:**

WhatsApp (also called WhatsApp Messenger) is an internationally available freeware, cross-platform, centralized instant messaging (IM) and voice-over-IP (VoIP) service owned by American company Meta Platforms. It allows users to send text and voice messages, make voice and video calls, and share images, documents, user locations, and other content. WhatsApp's client application runs on mobile devices, and can be accessed from computers.

HARDWARE REQUIREMENTS:

- Operating System.
- Processing.
- Operating System Specifications.

4.3. BLOCK DIAGRAM:

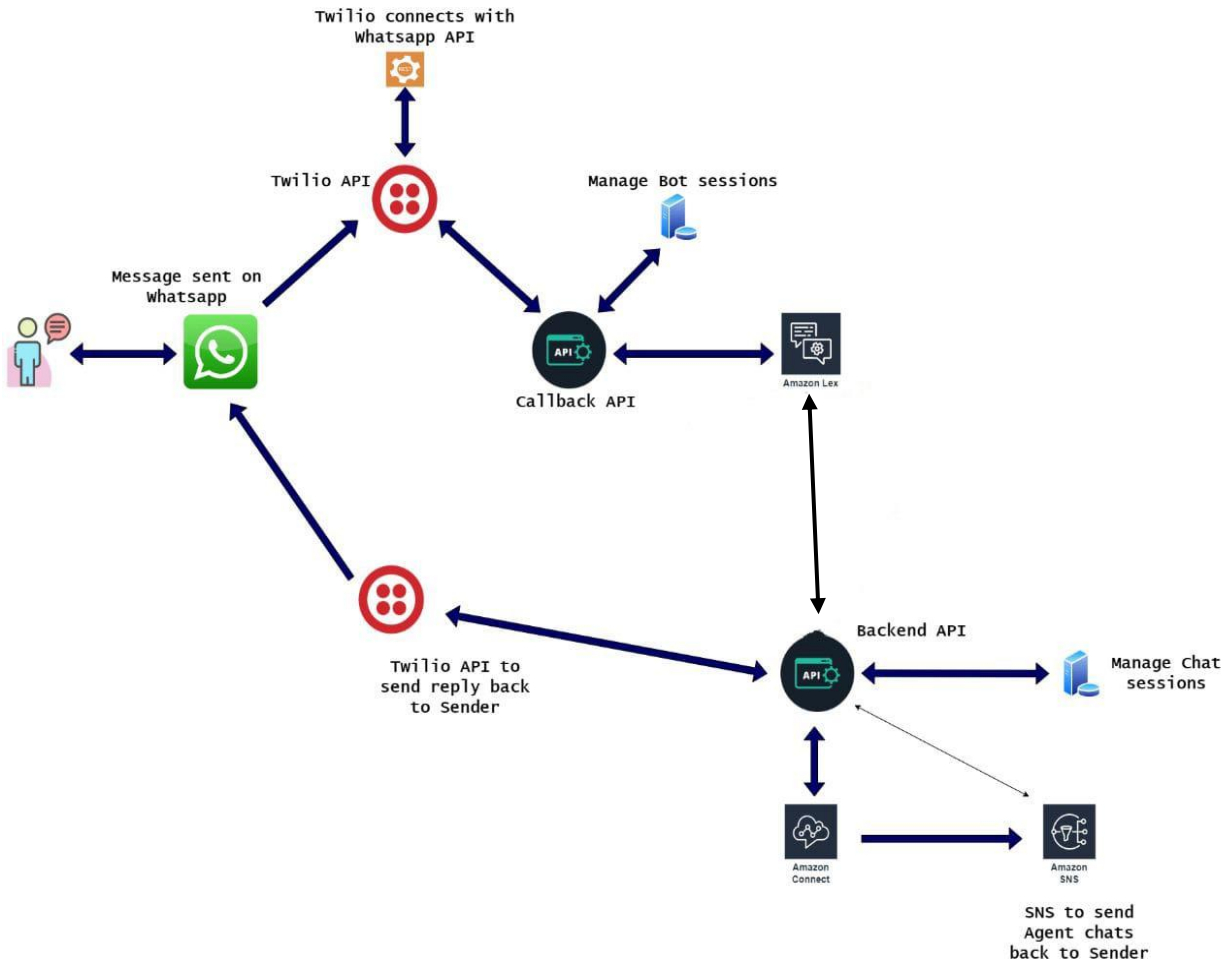

Fig 2. Block diagram

4.4. PROJECTFLOW:

To create a Restaurant chatbot, Amazon Lex will be the area to create a Bot and finally we use Twilio to integrate the Bot with WhatsApp.

- User Interacts with Bot.
- User queries entered on the UI.
- Bot responses with the appropriate answers.

To accomplish this task Following Activities are to be Completed

- Prerequisites:
  - Create AWS account.

- Create a Custom Bot:

- Login To Aws Account.
- Launch AWS Lex Service.
- Create a Custom BOT.

- Create Intents and Slot Types:
  - Create Greetings Intent.
  - Build Test the Bot.
  - Create Menu Intent.
  - Build Test the Bot.
  - Create Order Intent.
  - Create Slot types.
  - Build Test the Bot.
  - Create table Reservation Intent.
  - Create necessary Slot types for table Reservation.
  - Build Test the Bot.
- Integrate Bot with WhatsApp:
  - Publish the Bot.
  - Create a Twilio Account.
  - Publish the Bot in Twilio Account.
  - Join WhatsApp.
  - Test The App.

5. CONCLUSION:

In UG Project Plane-1, we have worked on problem statement, literature survey and also done the experimental analyses which are required for the project to move forward. In experimental analysis we have discussed about the Chatbot creation concepts and explained in how to be used in the project. We also discussed about the flowcharts, decision tree and sequence diagrams which are used in the project. Based on the experimental analysis we have designed the model for the project. Entire designing part is involved in UG Project Phase-1.

6. FUTURE SCOPE:

UG Project Phase-2 is the extension of UG Project Phase-1. UG Project Phase-2 involves all the procedure and implementation of the design which we have retrieved in the UG Project Phase-1. All implementation is done and conclusion will be retrieved in the phase. We will also work on the applications, advantage, and disadvantages of the project in this phase. Future scope of the project will be also discussed in the UG Project Phase-2.