

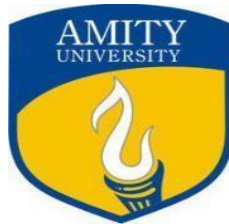
**SUMMER INTERNSHIP REPORT**  
**on**  
**CHAT-BOT** Using *Cloud Computing* (AWS)

*submitted in partial fulfilment of the requirements for the award of the degree of*

Bachelor of Technology  
*in*  
Computer Science and Engineering

**By:**  
**RISHAB MATTOO**  
Enrollment No: - A50105220002

*Under the guidance of*  
Dr. Surjeet Dalal



Department of Computer Science & Engineering  
Amity School of Engineering & Technology  
**AMITY UNIVERSITY HARYANA, GURUGRAM**



## **Department of Computer Science and Engineering**

**Amity School of Engineering and Technology**

### **DECLARATION**

I, **Rishab Mattoo**, student of B.Tech (Computer Science & Engineering) hereby declare that the project entitled “**CHAT-BOT Using Cloud Computing (AWS TOOL's)**” which is submitted by me to department of Computer Science & Engineering, Amity School of Engineering & Technology, Amity University Haryana, in partial fulfilment of the requirement for the award of the degree of **Bachelors of Technology in Computer Science & Engineering**, has not been previously formed the basis for the award of any degree, diploma or other similar title or recognition.

**Date:**

**RISHAB MATTOO**



## **Department of Computer Science and Engineering**

Amity School of Engineering and Technology

### **CERTIFICATE**

This is to certify that the work in the project report entitled “**CHAT-BOT Using Cloud Computing (AWS TOOL’s)**” by **RISHAB MATTOO** bearing **A50105220002** is a Bonafede record of project work carried out by him under my supervision and guidance in partial fulfilment of the requirements for the award of the degree of ‘Bachelor of Technology’ **VII** semester in the Department of Computer Science and Engineering, Amity School of Engineering and Technology, Amity University Haryana, Gurgaon. Neither this project nor any part of it has been submitted for any degree or academic award elsewhere.

**Date:**

**Dr. Surjeet Dalal**

Computer Science & Engineering

ASET, AUH

**Head**

Department of Computer Science & Engineering

ASET, AUH

# ACKNOWLEDGEMENT

I am presenting this project report entitled “**CHAT-BOT Using Cloud Computing (AWS TOOL's)**”.

I would like to acknowledge the open-source community for their valuable contributions. The collaborative spirit and sharing of knowledge have greatly enriched our application's functionality and features.

I would like to thank my guide **Dr. Surjeet Dalal** for their constant support and guidance without whom the development of this project would not have been a success. In the last I would also like to thank all my colleagues who rendered their abilities to the completion of this project. Project on the topic “**CHAT-BOT Using Cloud Computing (AWS TOOL's)**” which also helped me in doing a lot of Research and gaining some precious knowledge.

Finally, I wish to express our appreciation to our parent for their love and support.

**Rishab Mattoo**

**Enrollment Number: A50105220002**

# **ABSTRACT**

This project presents a concise overview of a chatbot system utilizing Amazon Web Services (AWS) tools, showcasing the seamless integration of cloud computing and conversational AI. Leveraging Amazon Lex, and other AWS services, this chatbot ensures scalability, security, and efficient NLP-driven interactions. It serves as a cost-effective and versatile solution for diverse industry applications, enhancing user experiences while automating routine tasks.

# TABLE OF CONTENT

DECLARATION .....	ii
CERTIFICATION .....	iii
ACKNOWLEDGEMENT .....	iv
ABSTRACT.....	v
TABLE OF CONTENT .....	vi
INTERSHIP CERTIFICATE.....	vii
<b>CHAPTER – 1</b>	
<b>INTRODUCTION.....</b>	<b>8</b>
1.1 Background... ..	8-9
1.2 Objective & Scope .....	10
<b>CHAPTER – 2</b>	
<b>LITERATUERE REVIEW.....</b>	<b>11</b>
2.1 Chat-Bot and Their Importance .....	11
2.2 Cloud Computing in Chat-Bot Development .....	11
2.3 AWS Tool for Chat-Bot Development .....	12-13
<b>CHAPTER – 3</b>	
<b>SYSTEM REQUIREMENT .....</b>	<b>14</b>
3.1 Development Environment... ..	14
<b>CHAPTER – 4</b>	
<b>IMPLEMENTATION .....</b>	<b>15</b>
4.1 Chat-Bot Development with Amazon Lex... ..	15-22
4.2 Integrating Amazon Lex with Kommunicate .....	23-26
<b>CHAPTER – 5</b>	
<b>USE CASE .....</b>	<b>27</b>
5.1 Customer Support .....	27
5.2 Information Retrieval .....	27
5.3 Task Automation.....	28
<b>CHAPTER – 6</b>	
<b>CONCLUSION .....</b>	<b>29</b>
6.1 Conclusion... ..	29
<b>REFERENCE.....</b>	<b>30</b>

# INTERSHIP CERTIFICATE



## CERTIFICATE OF TRAINING COMPLETION

This is to certify that

Mr./Ms. RISHAB MATTOO

has successfully completed his / her term of Training

in Cloud Computing from 12-Jul-2023

to 12-Aug-2023 and has proven his/her

competency with utmost dedication and promise.



Certificate number: AGC2023071376  
For certificate authentication  
Scan QR code

Challa Rohit  
Academic Head



# CHAPTER 1

## INTRODUCTION

In today's fast-paced digital era, businesses and organizations are constantly seeking innovative ways to enhance customer engagement and streamline operations. One such groundbreaking technology that has emerged as a game-changer in the realm of customer service and automation is Chatbots. These intelligent conversational agents are redefining the way companies interact with their customers and manage internal processes.

Cloud computing, on the other hand, has revolutionized the way IT resources are provisioned and managed. It has made it possible for organizations to scale their infrastructure seamlessly, reduce costs, and gain access to a wide array of services. One of the leading cloud service providers, Amazon Web Services (AWS), has paved the way for the development and deployment of cutting-edge Chatbots through its service known as AWS Lex.

AWS Lex is a cloud-based service that leverages the power of natural language understanding (NLU) and automatic speech recognition (ASR) technologies. It allows developers to build highly customizable and sophisticated Chatbots that can comprehend and respond to human language, whether it's in text or voice form. With AWS Lex, businesses can create intelligent virtual agents that can answer customer queries, automate routine tasks, and provide a personalized experience.

### 1.1 BACKGROUND

Before delving into the development of a Chatbot using AWS Lex, it's essential to have a solid background understanding of the key components, technologies, and concepts involved.

Below is a background study that will help you grasp the foundational knowledge necessary for creating a Chatbot using cloud computing with AWS Lex:

- Chatbots and Conversational AI
  - Understand what Chatbots are and how they work.
  - Explore the various types of Chatbots, including rule-based, AI-driven, and hybrid bots.
  - Learn about the benefits of using Chatbots, such as improved customer service, automation of repetitive tasks, and 24/7 availability.
- Natural Language Understanding (NLU)
  - Familiarize yourself with NLU and its role in enabling Chatbots to understand and process human language.
  - Learn about intent recognition and entity extraction, which are essential NLU components for Chatbots.
- Automatic Speech Recognition (ASR)
  - Comprehend the importance of ASR for voice-enabled Chatbots.
  - Understand how ASR technology converts spoken language into text, making it analyzable by the Chatbot.



- AWS Cloud Computing
  - Get an overview of cloud computing and its advantages, such as scalability, cost-effectiveness, and accessibility.
- AWS Lex
  - Dive into the specifics of AWS Lex as an AWS service for building conversational interfaces.
  - Explore Lex's capabilities, including text and speech recognition, intent recognition, and conversation management.
- Components of AWS Lex
  - Understand the key components of AWS Lex, such as bots, intents, and utterances.
  - Learn how to design conversational flows using these components.
- Deployment Options
  - Explore different deployment options for AWS Lex Chatbots, including web and mobile integration.
  - Understand how to integrate your Chatbot with messaging platforms, websites, and mobile applications.
- Security and Compliance
  - Familiarize yourself with security best practices when developing and deploying Chatbots.
  - Learn about compliance considerations, especially in industries with strict regulations like healthcare and finance.
- Machine Learning and Training Data
  - Gain insights into the role of machine learning in Chatbot development.
  - Understand the importance of training data and continuous model refinement for Chatbot accuracy.
- Use Cases
  - Explore real-world use cases of Chatbots powered by AWS Lex in various industries, such as e-commerce, customer support, and healthcare.
- Development Tools
  - Learn about the development tools, SDKs, and resources provided by AWS to streamline Chatbot creation.
- Best Practices and Challenges
  - Discover best practices for designing effective Chatbots that deliver a seamless user experience.
  - Be aware of common challenges in Chatbot development, such as handling complex user queries and maintaining context in conversations.

## 1.2 Objective & Scope

### Objective

The primary objective of developing a Chatbot for Cloud Computing using AWS Lex is to harness the power of conversational AI and cloud services to improve customer experiences, streamline operations, and enhance efficiency in cloud-related tasks. The Chatbot will serve as an intelligent virtual assistant capable of understanding and responding to user queries and requests related to cloud computing on the AWS platform.

### Scope

- Cloud Service Information and Assistance
  - The Chatbot will provide users with information about various AWS services, their features, and use cases.
  - Users can inquire about pricing, documentation, and best practices related to AWS services.
- Troubleshooting and Issue Resolution
  - Users can seek assistance with troubleshooting common issues and errors encountered while using AWS services.
  - The Chatbot will guide users through the resolution process or escalate complex issues to human support if necessary.
- Resource Management and Monitoring
  - Users will be able to query and manage their AWS resources, including EC2 instances, S3 buckets, and RDS databases.
  - The Chatbot can provide real-time updates on resource status and usage metrics.
- Security and Access Control
  - Users can receive guidance on AWS security best practices and access control mechanisms.
  - The Chatbot can assist in setting up and configuring security settings for AWS resources.
- Cost Optimization
  - The Chatbot will offer cost optimization recommendations, such as rightsizing instances or enabling cost monitoring.
  - Users can inquire about their current AWS billing and spending trends.
- Deployment and Scaling
  - Users can request assistance with deploying applications on AWS, including autoscaling configurations.
  - The Chatbot can provide guidance on selecting the right AWS resources for specific workloads.
- Documentation and Training
  - The Chatbot will offer links to relevant AWS documentation, tutorials, and training resources.
  - Users can access learning materials and guided exercises to improve their AWS skills.

## **CHAPTER 2**

### **Literature Review**

#### **2.1. Chat-Bot and Their Importance**

Chatbots are AI-powered conversational agents that have gained immense importance in today's digital landscape. These virtual assistants are transforming the way businesses interact with customers and manage internal operations. Their significance lies in their ability to provide instant and personalized responses to user inquiries, automate routine tasks, and enhance user experiences across various industries. Chatbots streamline customer support, boost efficiency, and are available 24/7, ensuring businesses can engage with their audience effectively. Their importance in improving customer satisfaction, reducing operational costs, and staying competitive cannot be overstated. As businesses continue to embrace digital transformation, chatbots are becoming an indispensable tool for achieving these goals.

#### **2.2. Cloud Computing in Chat-Bot Development**

Cloud computing plays a pivotal role in the development of Chatbots, revolutionizing their capabilities and scalability. By leveraging cloud infrastructure, Chatbot developers can harness the immense computational power and storage resources needed to build and deploy sophisticated conversational agents. Cloud platforms like AWS, Google Cloud, and Azure offer specialized services for natural language processing (NLP) and automatic speech recognition (ASR), essential components of Chatbot development. Additionally, cloud-based solutions provide the flexibility to deploy Chatbots on multiple channels, such as websites, mobile apps, and messaging platforms, ensuring seamless accessibility for users. Cloud computing is not merely a technical backbone; it empowers Chatbots to handle complex tasks, process vast amounts of data, and continuously improve their performance through machine learning. In essence, cloud computing is the enabler that propels Chatbots into the future of intelligent and responsive virtual assistant.

## **2.3. AWS Tool for Chat-Bot Development**

Amazon Web Services (AWS) provides a range of tools and services that are invaluable for Chatbot development.

*Some of the key AWS tools and services used in Chat-Bot development include:*

### **1. Amazon Lex**

Amazon Lex is a purpose-built service for building conversational interfaces, including Chatbots. It provides natural language understanding and automatic speech recognition capabilities to enable voice and text-based interactions. Developers can define intents, entities, and conversational flows using Lex, making it a fundamental tool for Chatbot development on AWS.

### **2. Amazon Lambda**

AWS Lambda allows you to run code in response to events. Chatbots often require custom logic to handle specific user requests or integrate with external services. Lambda functions can be triggered by Lex or other AWS services to execute the necessary backend operations for the Chatbot.

### **3. Amazon API Gateway**

To expose your Chatbot to web and mobile applications, you can use Amazon API Gateway. It enables you to create, publish, and manage APIs, including RESTful interfaces for your Chatbot, allowing easy integration with various client applications.

### **4. Amazon S3 (Simple Storage Service)**

AWS S3 is used for storing and managing data and assets that Chatbots may need, such as images, audio files, or large datasets. It provides scalable and durable storage for Chatbot resources.

### **5. Amazon Polly**

Amazon Polly is a service for text-to-speech conversion. It can be used to make your Chatbot's responses sound more natural by converting text responses into lifelike speech.

### **6. Amazon DynamoDB**

For storing and retrieving Chatbot session data or user preferences, DynamoDB, a NoSQL database service, can be employed. It provides fast and scalable database capabilities.

### **7. Amazon CloudWatch**

CloudWatch is used for monitoring and logging Chatbot performance and usage. It helps track metrics, detect and troubleshoot issues, and ensure the Chatbot's reliability.

### **8. Amazon Cognito**

Cognito provides user identity and access management, which is crucial for securing Chatbot interactions.

## **9. Amazon Comprehend**

Amazon Comprehend is a natural language processing service that can be used alongside Lex to extract insights and sentiment from user interactions, providing valuable analytics for Chatbot improvement.

## **10. Amazon Connect**

If you're building a customer support Chatbot, Amazon Connect can be integrated to enable seamless transitions from the Chatbot to human agents, offering a comprehensive customer service solution.

## **CHAPTER 3**

### **SYSTEM REQUIREMENT**

#### **3.1 Development Environment**

##### **1. Hardware Configuration**

- Intel i5
- 8GB Ram

##### **2. Software Configuration**

- OS – Windows 10 pro
- Software used – AWS Cloud

##### **3. Platform Used: AMAZON**

# CHAPTER 4

## IMPLEMENTATION

### 4.1. Chat-Bot Development with Amazon Lex

✓ First go to AWS console, Search Amazon LEX tool.

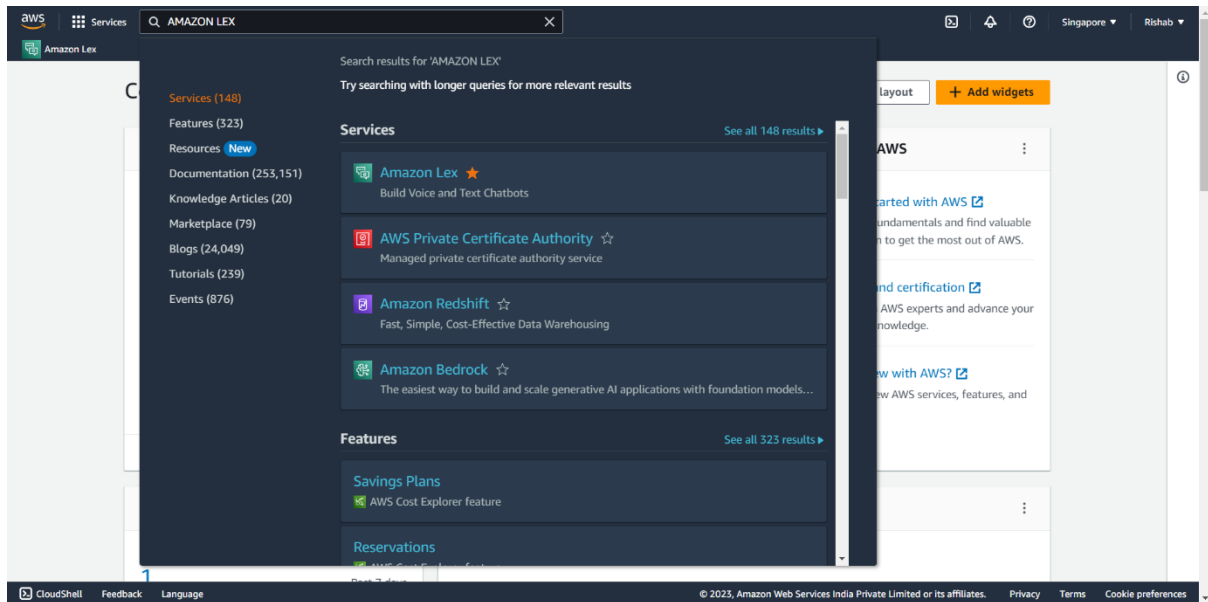


Figure 4.1.1

✓ After opening the Amazon Lex, Here I have already created the bot. But u must click on Create Bot.

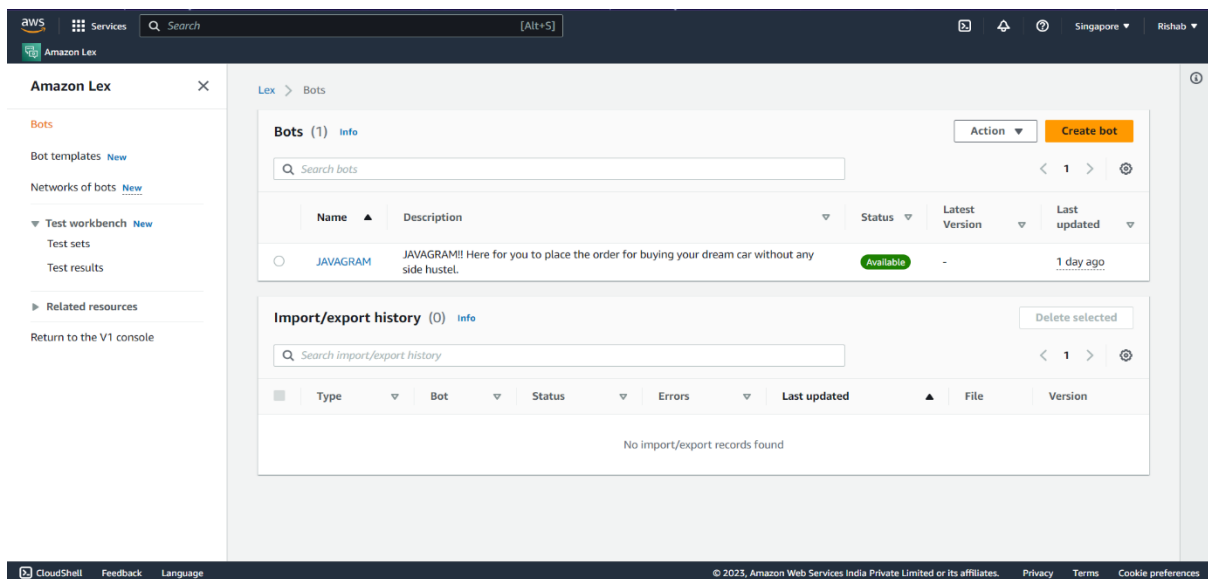


Figure 4.1.2

✓ Here we have all the info about the bot.

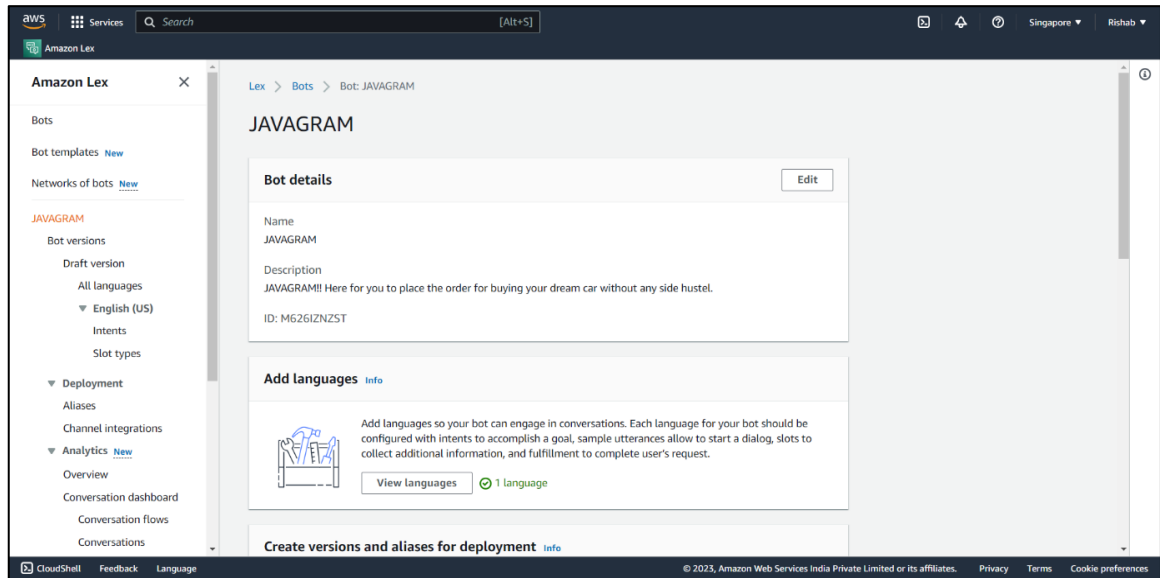


Figure 4.1.3

✓ But We must focus on this section on left side. Here all work take place.

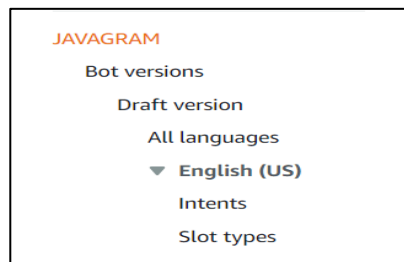


Figure 4.1.4

✓ Now we are in “ Intent ” all the main work take place. As written in the description an intent represents an action that the user wants to perform.

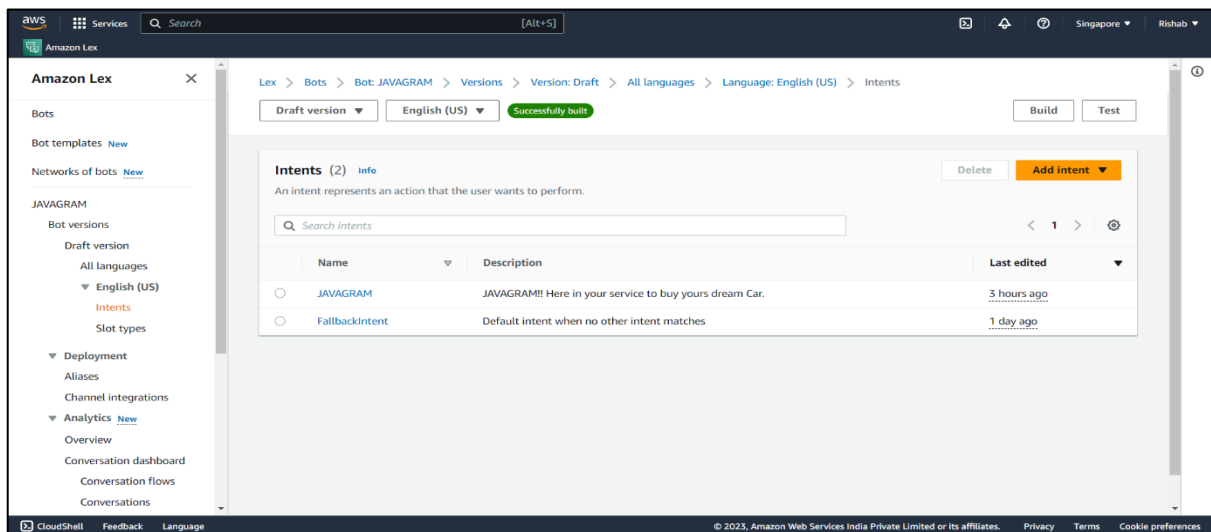


Figure 4.1.5



- ✓ Now we are in “ Slot Type ” here its like backend where all sub- part material is stored. Like below

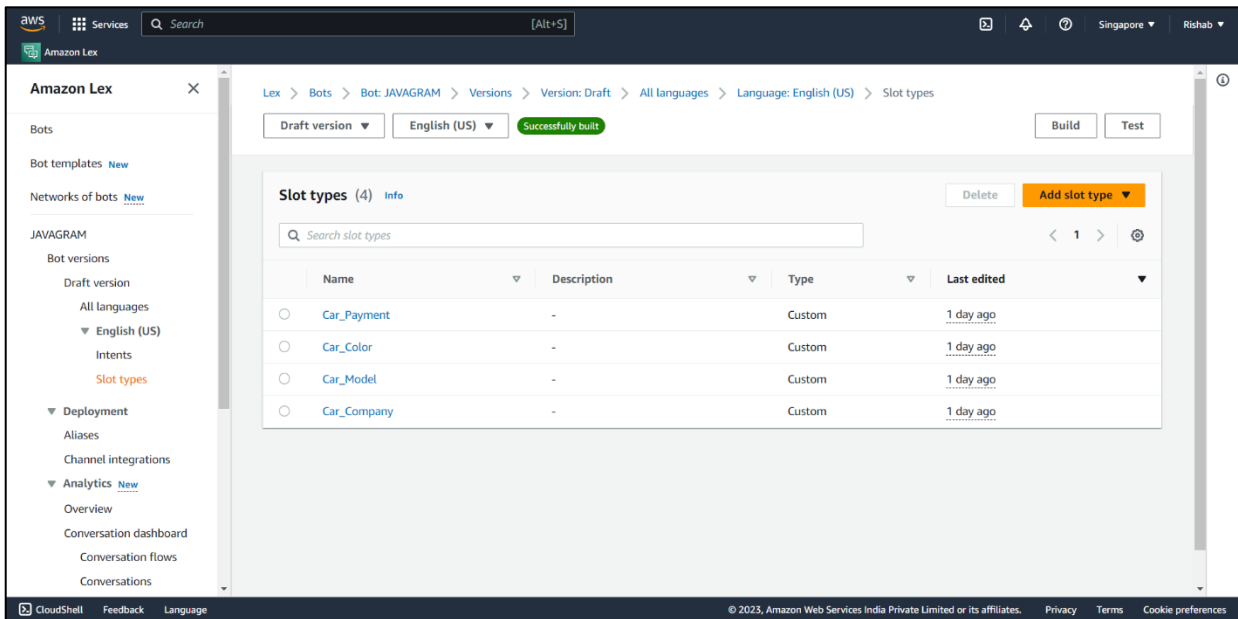


Figure 4.1.6

- ✓ Now lets come back to “ Intent ” .

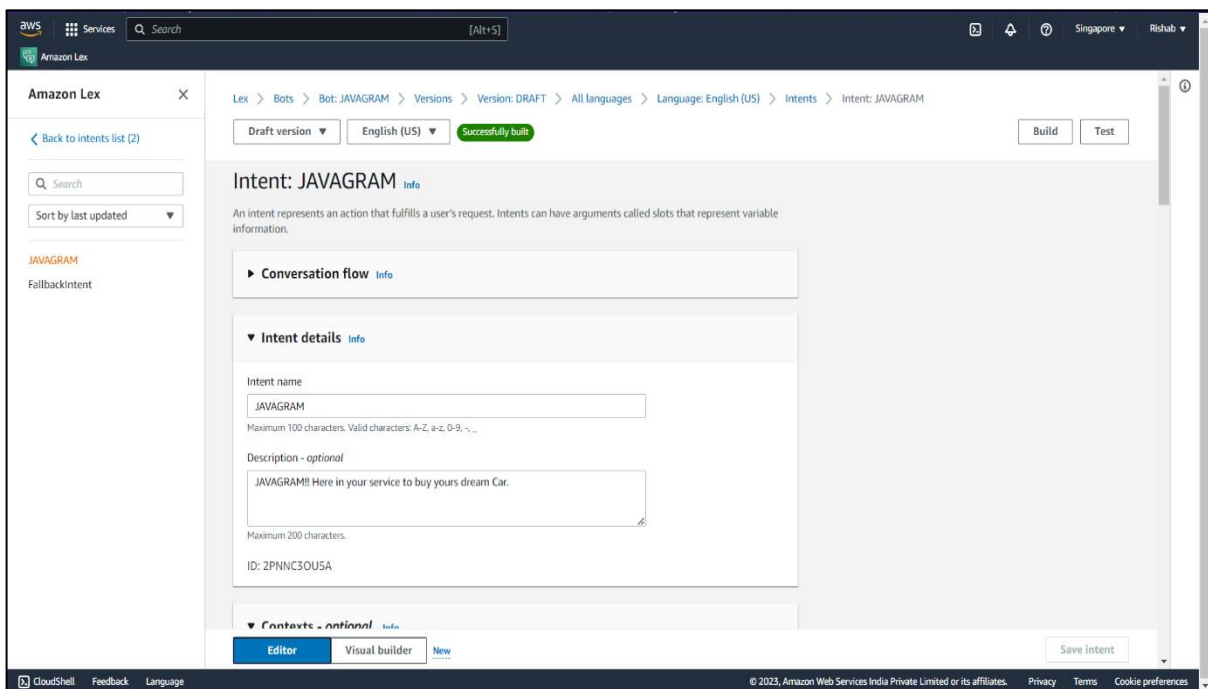


Figure 4.1.7

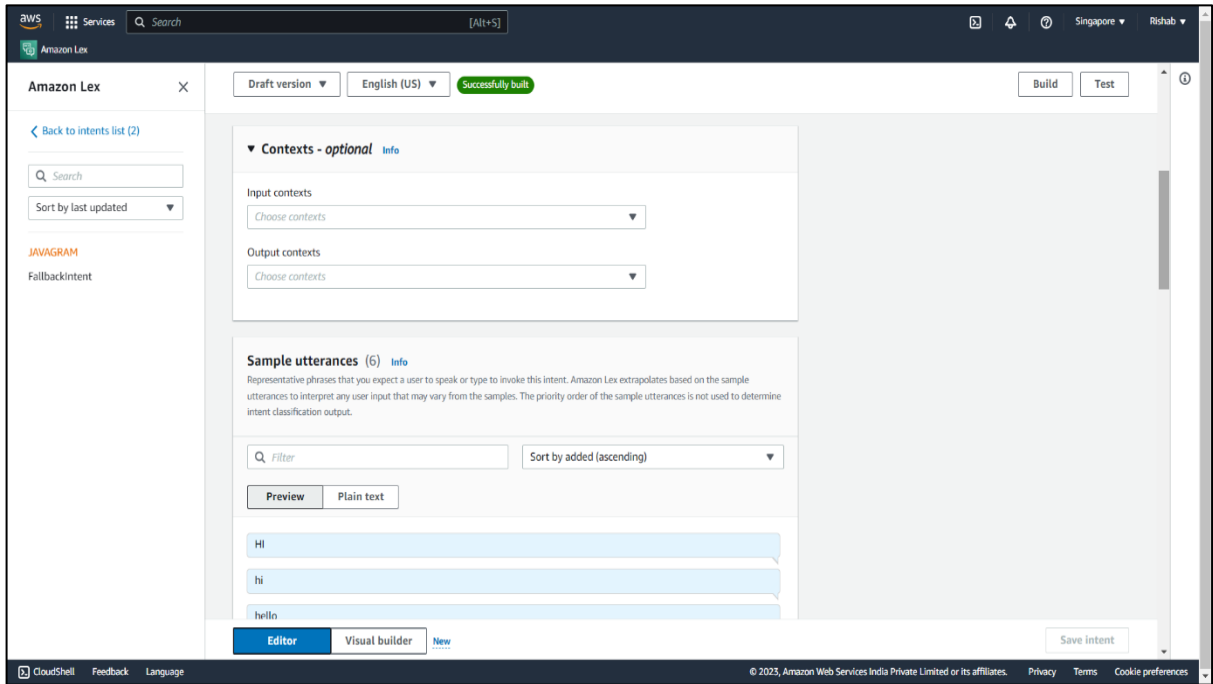


Figure 4.1.8

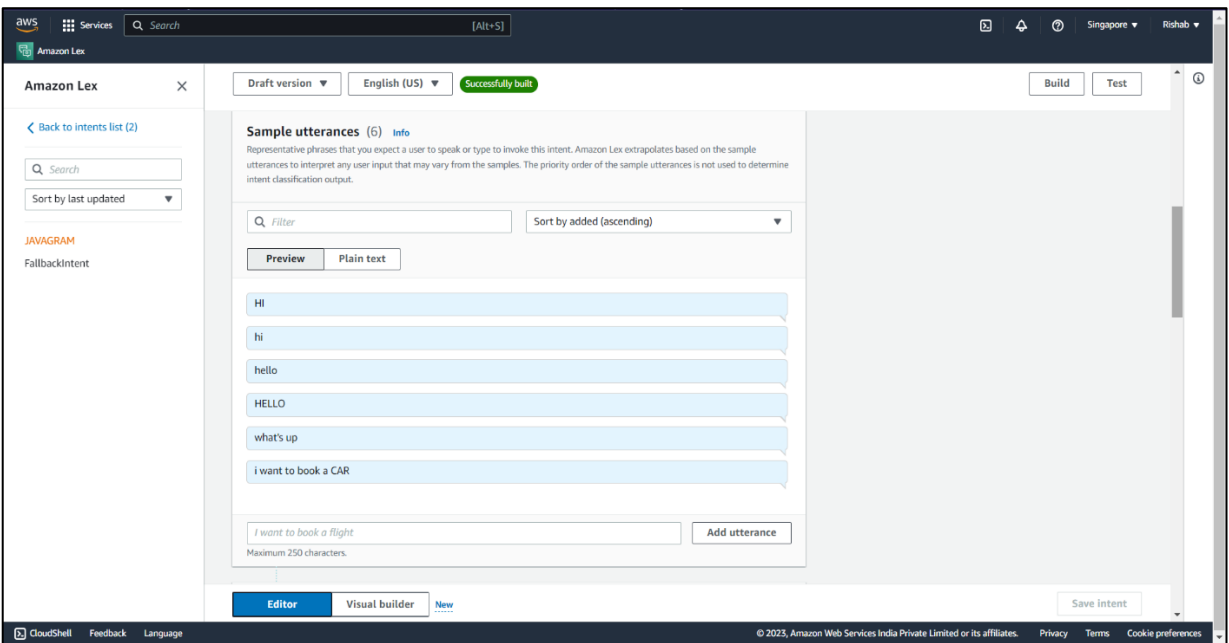


Figure 4.1.9

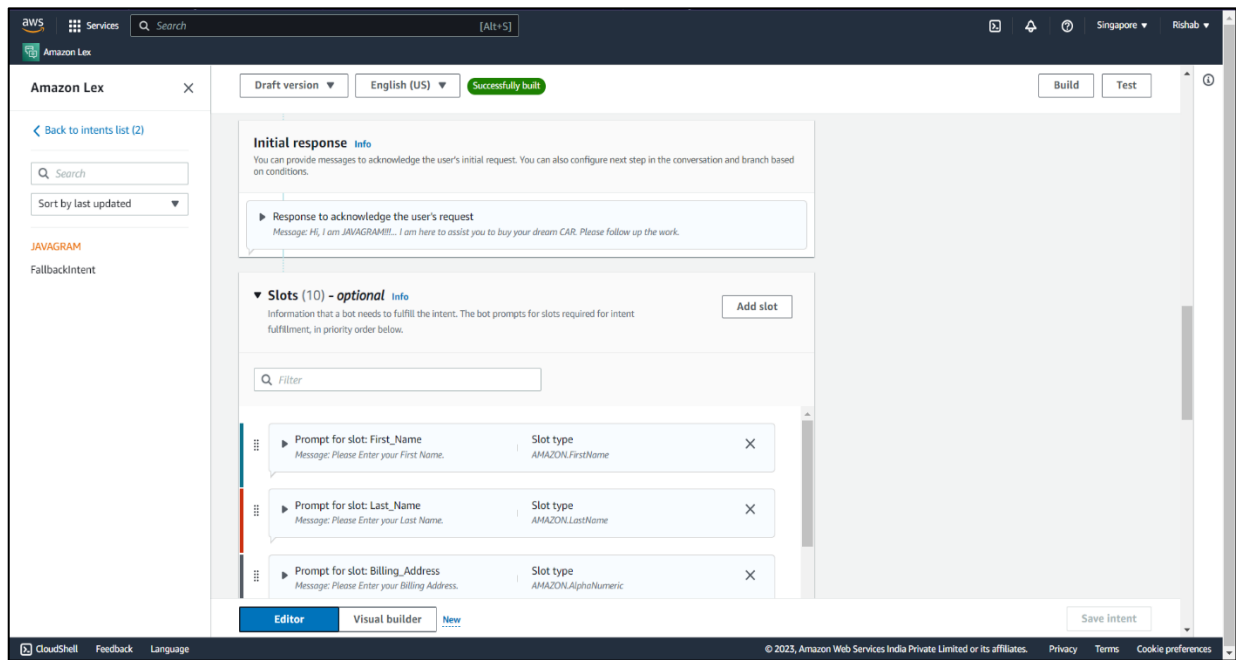
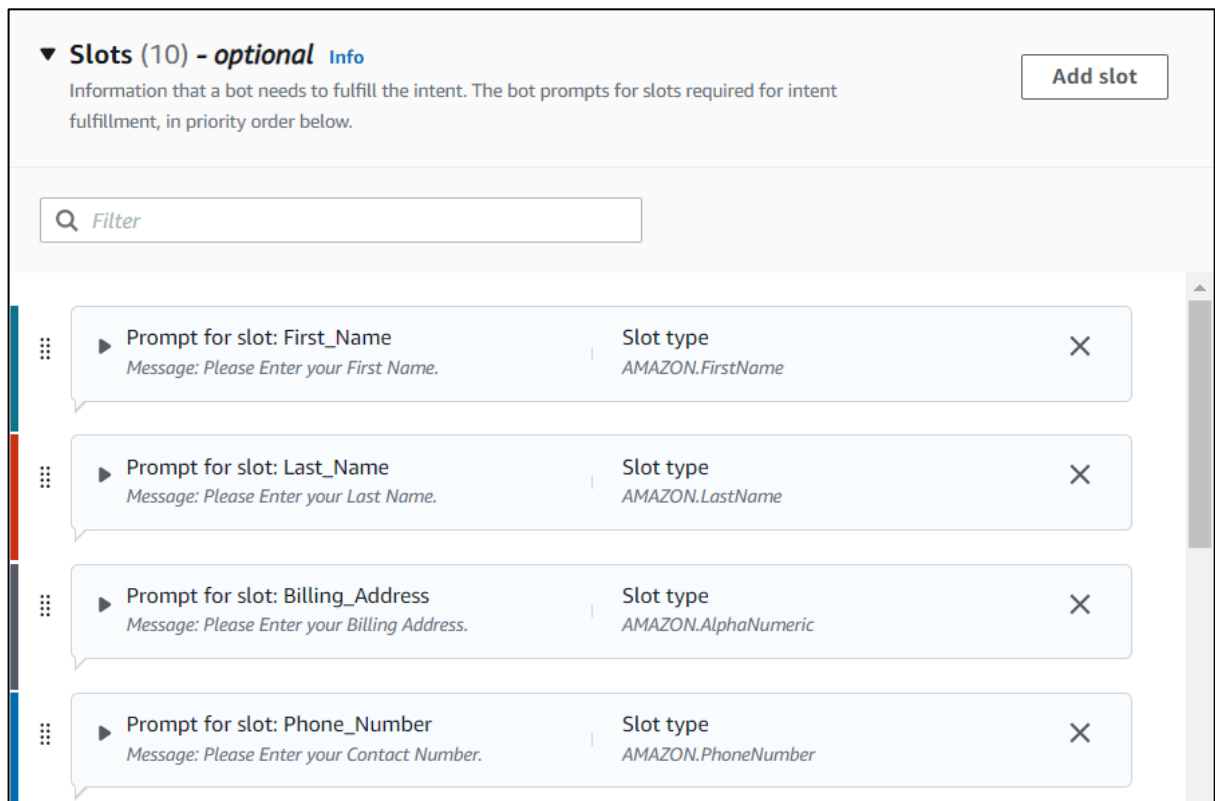
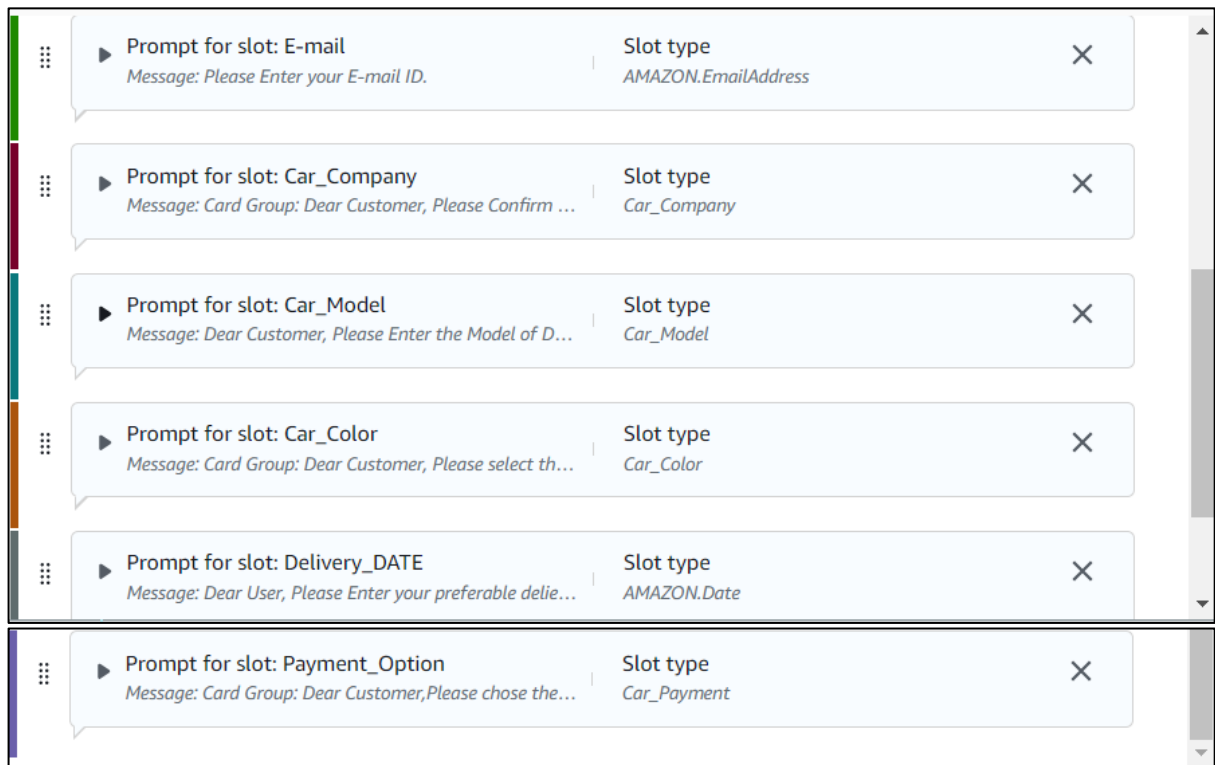


Figure 4.1.10

- ✓ Here all the prompting work for user input and output .
- ✓ In slot, as the description say info that a bot need to fulfil the intent. The bot prompts for slots required for intent fulfilment, in priority order below.





✓ Now the confirmation tab and other tab for response.

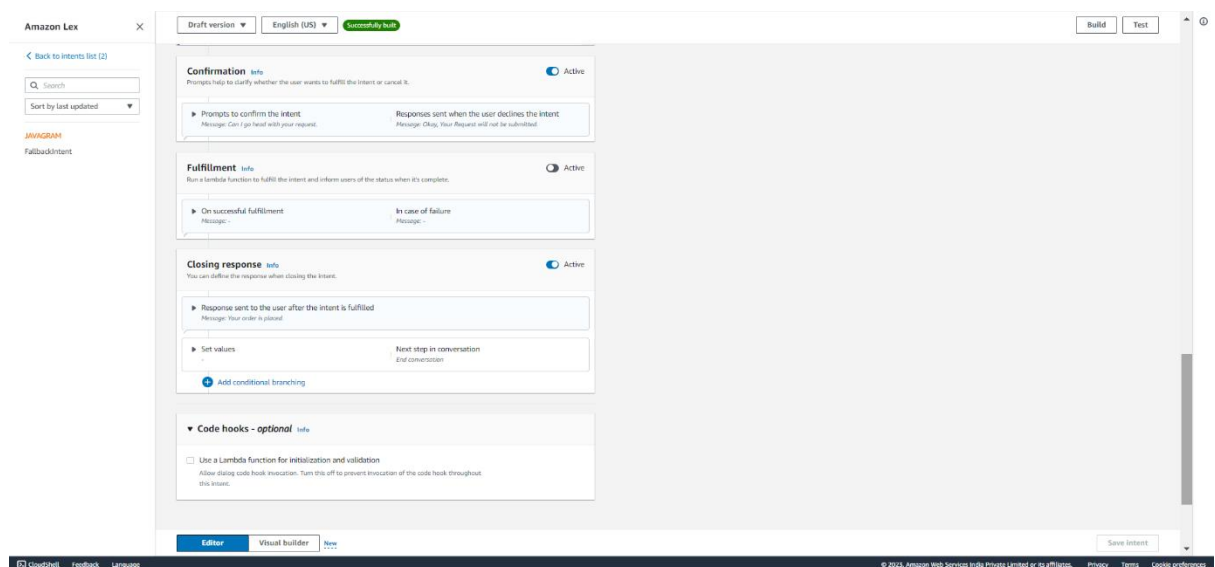


Figure 4.1.11

✓ Here are the slot for the intent which are used. Above

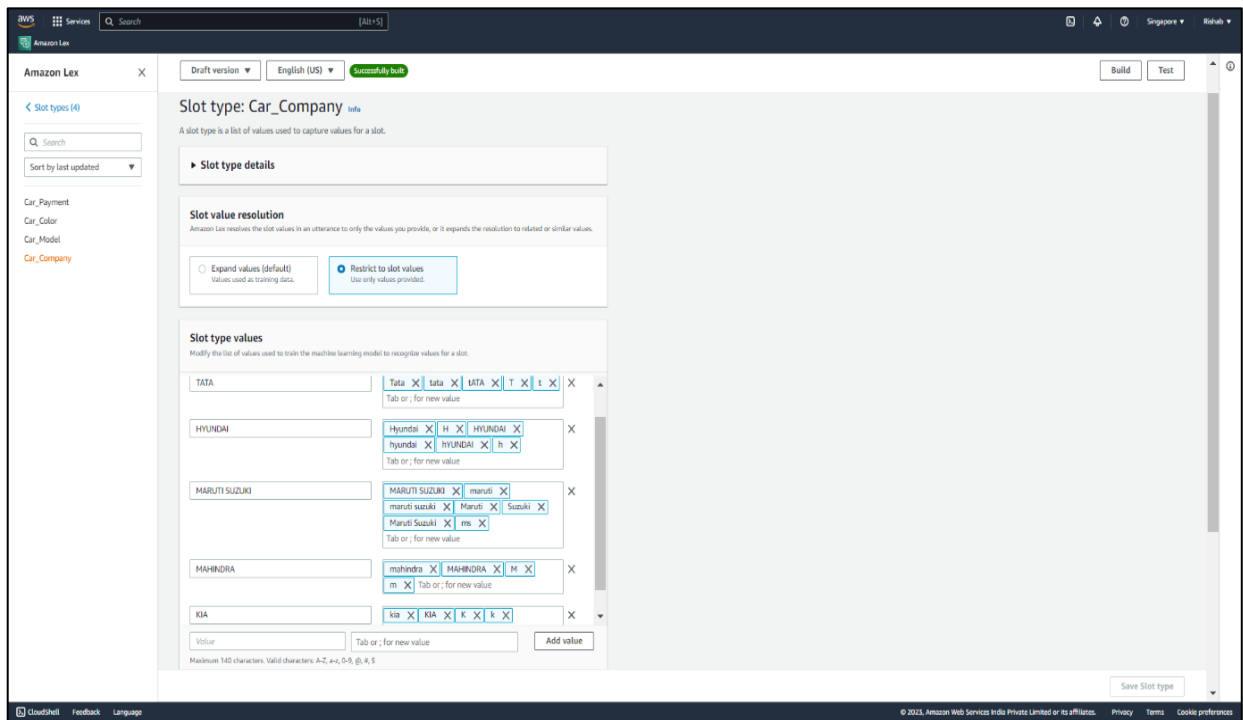


Figure 4.1.12

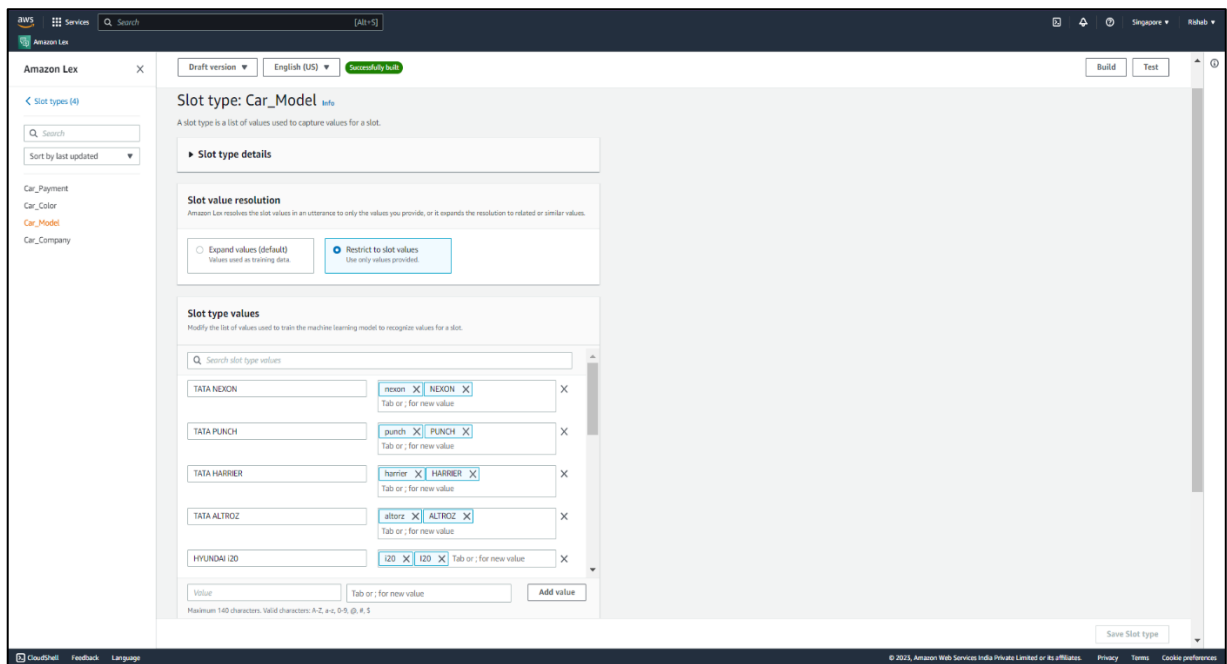


Figure 4.1.13

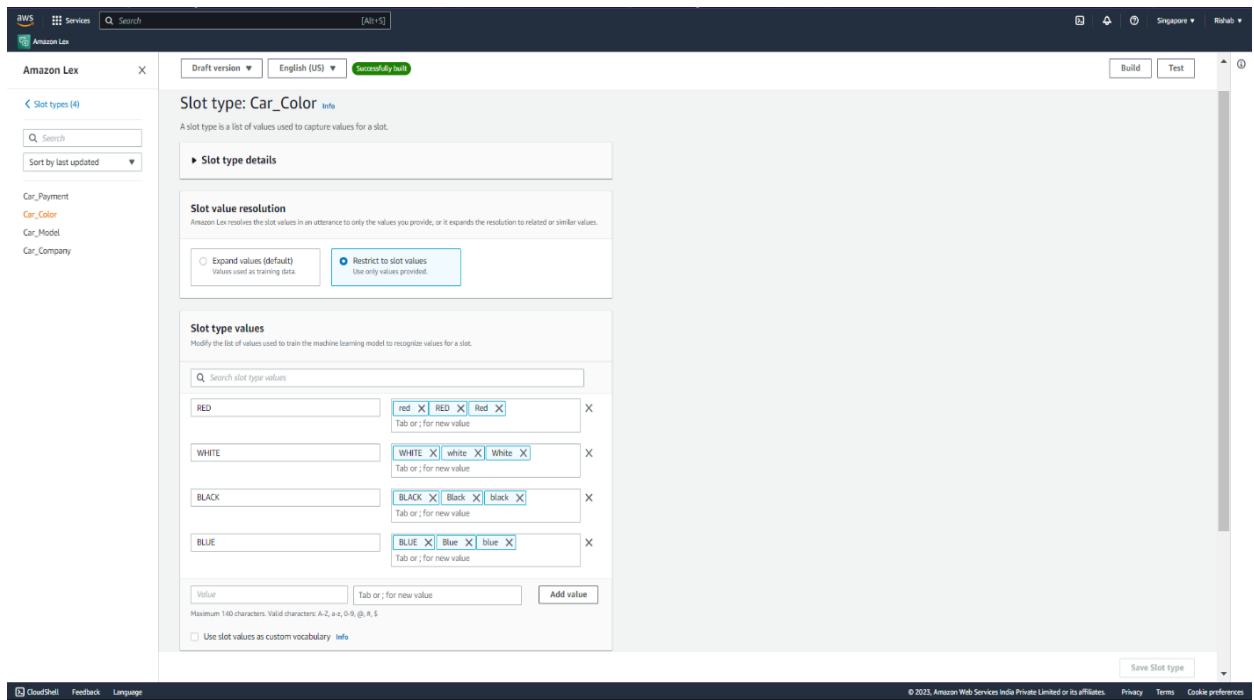


Figure 4.1.14

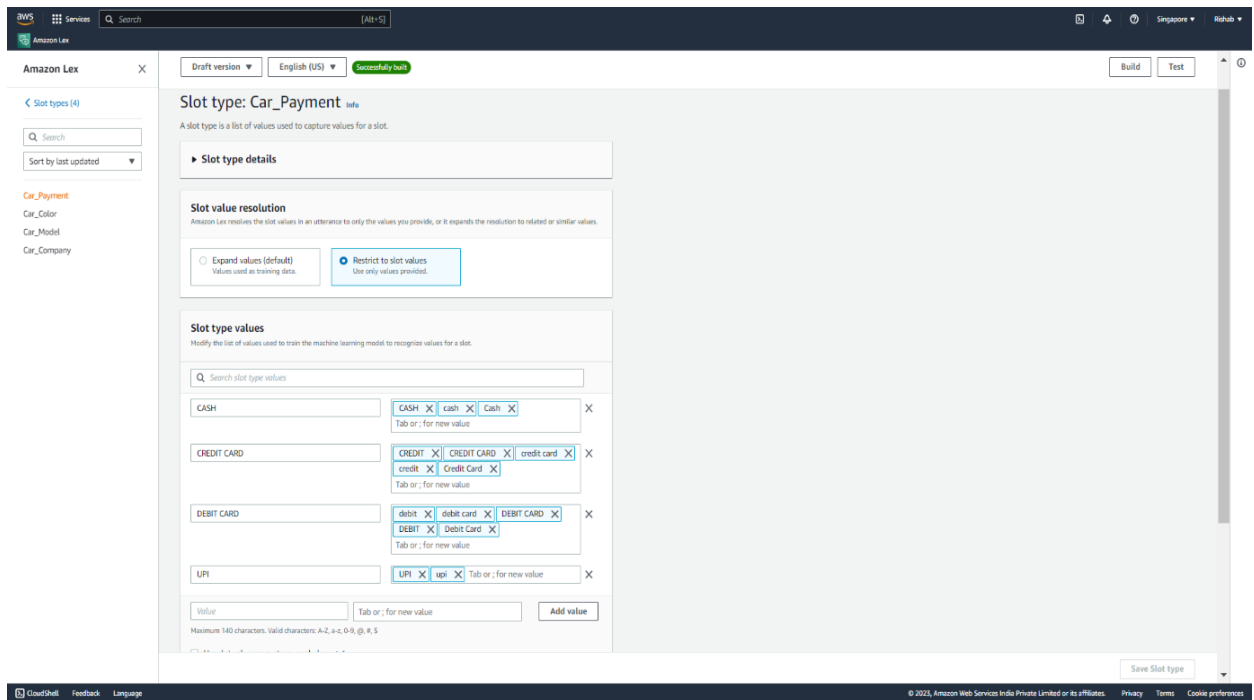


Figure 4.1.15

## 4.2. Integrating Amazon Lex with Kommunicate (LOCAL PLATFORM)

- ✓ Here the test draft on local platform.

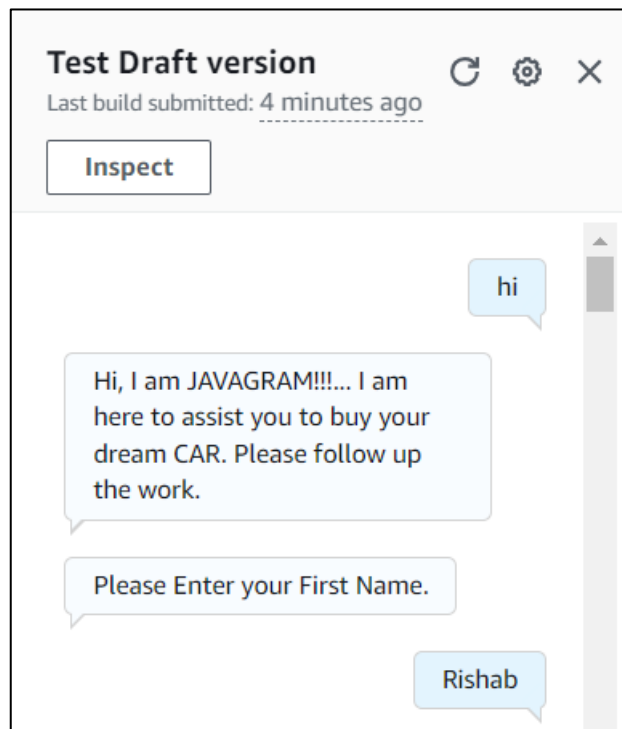


Figure 4.2.1

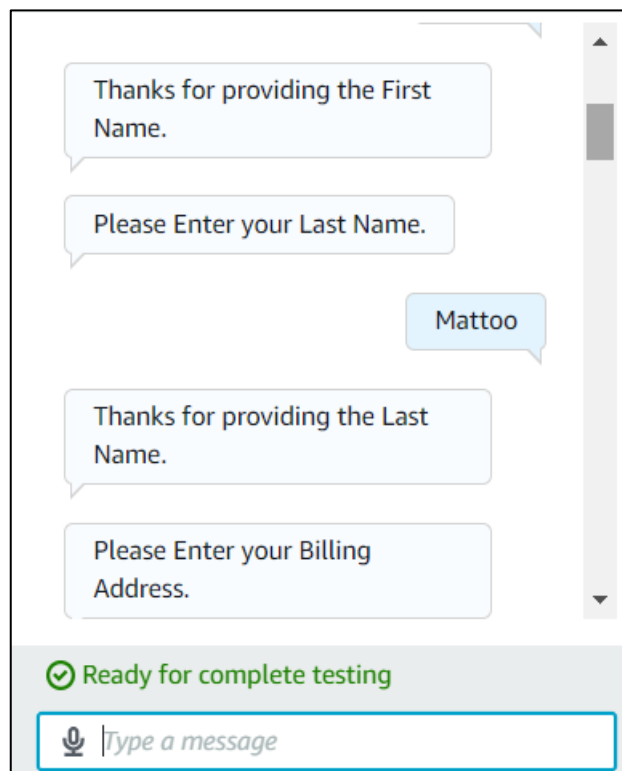


Figure 4.2.2

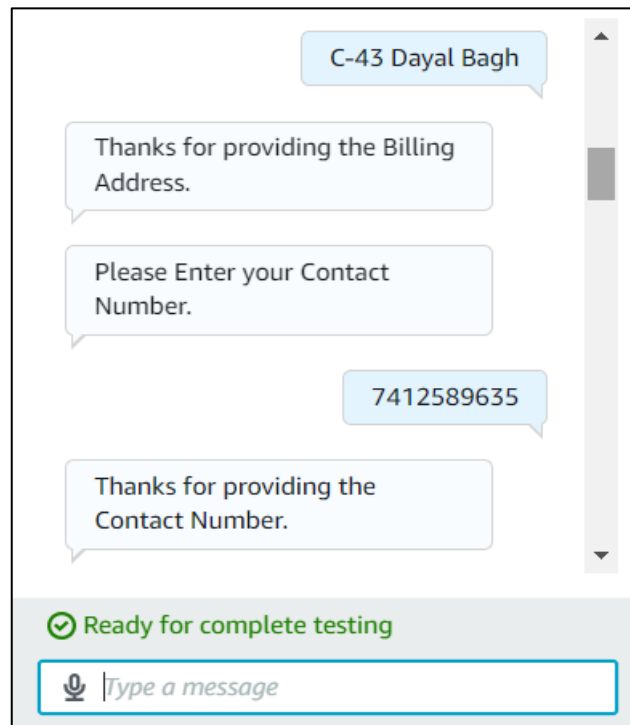


Figure 4.2.3

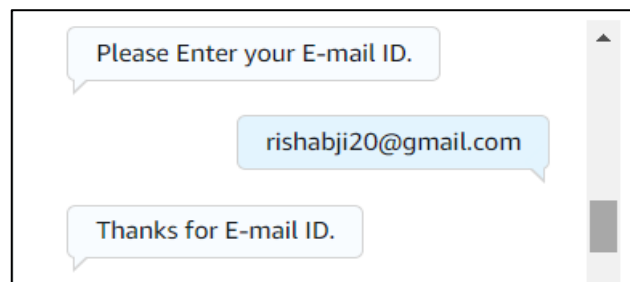


Figure 4.2.4

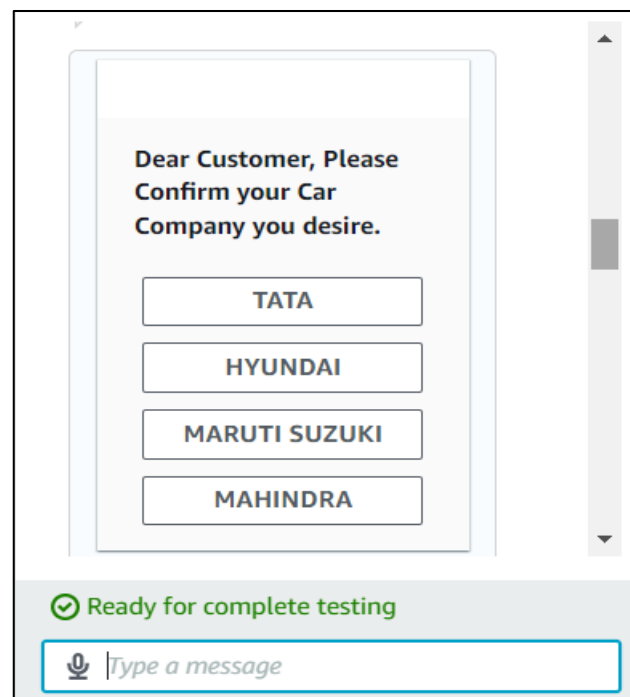


Figure 4.2.5



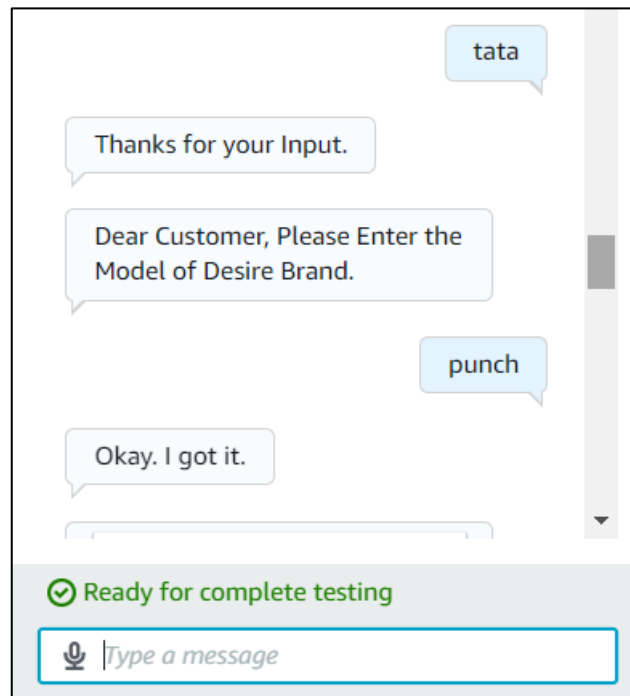


Figure 4.2.

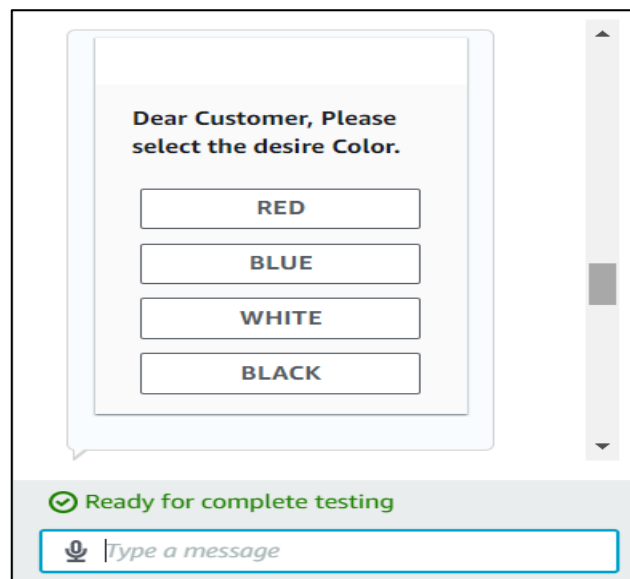


Figure 4.2.7

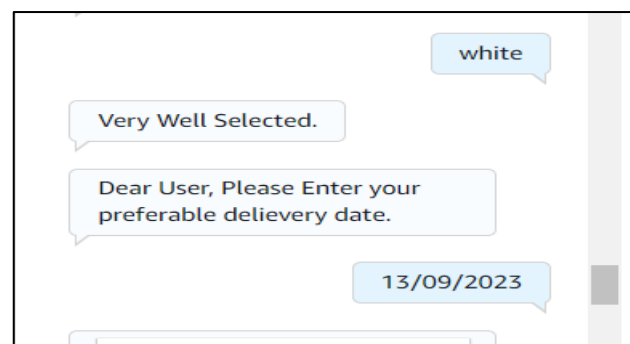


Figure 4.2.8

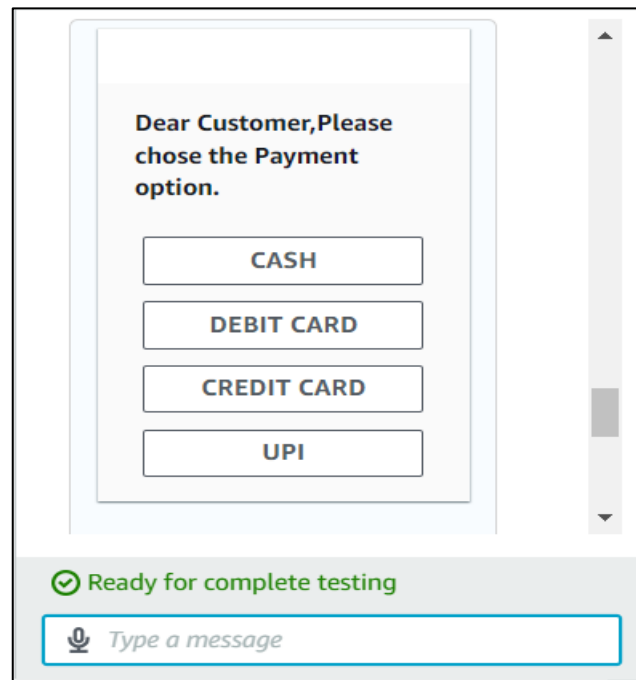


Figure 4.2.9

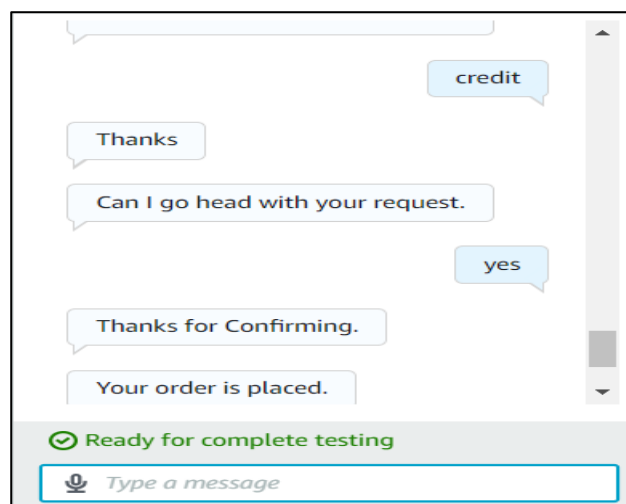


Figure 4.2.10

# CHAPTER 5

## USE CASE

### 5.1. Customer Support

Integrating customer support into a Chatbot for Cloud Computing using AWS Lex can be highly beneficial for both businesses and users.

Here's how you can implement effective customer support features within your Chatbot:

- User Authentication and Access Control
- User Account Information Retrieval
- Billing and Cost Analysis
- Troubleshooting and Issue Resolution
- Resource Management
- Monitoring and Alerts
- Documentation and Knowledge Base Access
- Service Recommendations
- Service-Specific Support
- Escalation to Human Support
- Feedback Collection
- Multi-Platform Accessibility

### 5.2. Information Retrieval

Information retrieval is a critical aspect of a Chatbot for Cloud Computing using AWS Lex. Users rely on Chatbots to access relevant data, retrieve status updates, and gather information about their cloud resources.

Here are key ways to implement information retrieval in your Chatbot:

- Cloud Resource Status
- Resource Usage Metrics
- Billing and Cost Information
- Service Documentation and Best Practices
- Security Configurations
- Resource Events and Logs
- Cost Optimization Recommendations
- Integration with Monitoring and Alerting Tools
- Service-Specific Information

### 5.3. Task Automation

Task automation is a key feature in a Chatbot for Cloud Computing using AWS Lex. It enables users to automate routine and repetitive tasks related to cloud resource management and simplifies complex workflows.

Here's how you can implement task automation in your Chatbot:

- Resource Provisioning
- Scaling and Auto-Scaling
- Backup and Snapshot Creation
- Data Transfer and Migration
- Resource Termination
- Scheduled Tasks and Cron Jobs
- Log Analysis and Reporting
- Security Patching and Updates
- Cost Optimization Actions
- Incident Response and Remediation

# **CHAPTER 6**

## **CONCLUSION**

### **6.1 CONCLUSION**

In conclusion, the development and implementation of a Chatbot for Cloud Computing using AWS Lex represent a significant milestone in the realm of cloud technology and user interaction. This project has demonstrated the power of converging artificial intelligence, cloud computing, and natural language processing to create a versatile and intelligent virtual assistant.

Through this project, we have explored the potential of AWS Lex as a robust tool for building conversational interfaces tailored to the complexities of cloud computing. The Chatbot developed herein serves as a valuable resource for users, offering real-time access to cloud resources, automation of routine tasks, and comprehensive support for managing their AWS environment.

The importance of this project cannot be understated, as it addresses the evolving needs of businesses and individuals alike. By providing 24/7 support, immediate information retrieval, and task automation capabilities, the Chatbot enhances efficiency, reduces operational costs, and ensures a seamless user experience in the cloud computing domain.

Moreover, the project underscores the significance of cloud computing in modern IT landscapes. AWS Lex's integration with various AWS services has allowed us to create a Chatbot that not only understands and responds to user queries but also interfaces directly with cloud resources, promoting a new era of cloud management.

As we move forward, it is evident that Chatbots for Cloud Computing, such as the one developed in this project, will continue to evolve and find applications across diverse industries. Their potential to revolutionize customer support, streamline operations, and optimize cloud resource utilization positions them as indispensable tools in the digital transformation journey of organizations.

In conclusion, this project serves as a testament to the ever-expanding possibilities offered by cloud computing and conversational AI. As technology continues to advance, the integration of Chatbots into the cloud ecosystem promises to be a pivotal driver of efficiency, convenience, and innovation in the field of cloud computing.

### **6.2 FUTURE SCOPE**

The future scope for a Chatbot for Cloud Computing using AWS Lex is promising and holds the potential for further advancements and applications. In your project report, you can highlight the following areas where the Chatbot can evolve and expand its impact:

1. Multi-Cloud Support
2. AI and Machine Learning Integration
3. Voice Recognition and Synthesis
4. IoT Integration

## REFERENCE

- Qian, L., Luo, Z., Du, Y., & Guo, L. (2009). Cloud computing: An overview. In *Cloud Computing: First International Conference, CloudCom 2009, Beijing, China, December 1-4, 2009. Proceedings 1* (pp. 626-631). Springer Berlin Heidelberg.
- Dillon, T., Wu, C., & Chang, E. (2010, April). Cloud computing: issues and challenges. In *2010 24th IEEE international conference on advanced information networking and applications* (pp. 27-33). Ieee.
- Boss, G., Malladi, P., Quan, D., Legregni, L., & Hall, H. (2007). Cloud computing. *IBM white paper*, 321, 224-231.
- D'silva, G. M., Thakare, S., More, S., & Kuriakose, J. (2017, February). Real world smart chatbot for customer care using a software as a service (SaaS) architecture. In *2017 International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud)(I-SMAC)* (pp. 658-664). IEEE.