



**NAALAIYA THIRAN PROJECT - 2022
19ECI01-PROFESSIONAL READINESS FOR
INNOVATION, EMPLOYABILITY AND
ENTREPRENEURSHIP**



AI BASED DISCOURSE FOR BANKING INDUSTRY

A PROJECT REPORT

Submitted by

MANSHI MITHRA.T	1904089
MYTHILY.A	1904095
SHIVANI SINGH M	1904112
UMAPRIYA SELVAM	1904119

**DEPARTMENT OF ELECTRONICS AND
COMMUNICATION ENGINEERING**

COIMBATORE INSTITUTE OF TECHNOLOGY, COIMBATORE – 641 014

(Government Aided Autonomous Institution affiliated to Anna University)

ANNA UNIVERSITY: CHENNAI 600025

NOVEMBER 2022

COIMBATORE INSTITUTE OF TECHNOLOGY

(Government aided Autonomous Institution Affiliated to Anna University)

COIMBATORE – 641014

ANNA UNIVERSITY: CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this report “**AI BASED DISCOURSE FOR BANKING INDUSTRY**” is the bonafide work of **MANSHI MITHRA T (1904089), MYTHILY A(1904095), SHIVANI SINGH M(1904112), UMAPRIYA SELVAM(1904119)** who carried out **19ECI01 Professional Readiness for Innovation, Employability and Entrepreneurship** project offered by IBM and Anna University ,Chennai.

SIGNATURE

Mr. K. MURALIDHARAN

FACULTY MENTOR

Assistant professor

Department of Electronics
and Communication

Engineering

SIGNATURE

Dr. S. UMA MAHESWARI

FACULTY EVALUATOR

Professor

Department of Electronics
and Communication

Engineering

SIGNATURE

Dr. A. RAJESWARI, M.E. Ph.D.,

PRINCIPAL AND HEAD

Professor

Department of Electronics
and communication

Engineering

TABLE OF CONTENTS

Phase	Phase Description	Week	Dates	Activity Details	Page
1	Preparation Phase (Pre- requisites, Registrations, Environment Set-up, etc.)	2	22 - 27 Aug 2022	Creation GitHub account & collaborate with Project repository in project workspace	
2	Ideation Phase (Literature Survey, Empathize, Defining Problem Statement, Ideation)	2	29 Aug – 3rd Sept 2022	Literature survey (Aim, objective, problem statement and need for the project)	
		3	5 - 10th Sept 2022	Preparing Empathy Map Canvas to capture the user Pains & Gains	
		4	12 - 17 Sept 2022	Listing of the ideas using brainstorming session	
3	Project Design Phase -I (Proposed Solution, Problem- Solution Fit, Solution Architecture)	5	19 - 24 Sept 2022	Preparing the proposed solution document	
		6	26 Sept - 01 Oct 2022	Preparing problem - solution fit document & Solution Architecture	
4	Project Design Phase -II (Requirement Analysis, Customer Journey, Data Flow Diagrams, Technology Architecture)	7	3 - 8 Oct 2022	Preparing the customer journey maps	
		8	10 - 15 Oct 2022	Preparing the Functional Requirement Document & Data- Flow Diagrams and Technology Architecture	
5	Project Planning Phase (Milestones & Tasks, Sprint Schedules)	9	17 - 22 Oct 2022	Preparing Milestone & Activity List, Sprint Delivery Plan	
6	Project Development Phase (Coding& Solutioning, acceptance Testing, Performance Testing)	10	24 - 29 Oct 2022	Preparing Project Development - Delivery of Sprint-1	
		11	31 Oct - 5 Nov 2022	Preparing Project Development - Delivery of Sprint-2	
		12	7 - 12 Nov 2022	Preparing Project Development - Delivery of Sprint-3	
		13	14 - 19 Nov 2022	Preparing Project Development - Delivery of Sprint-4	
7	Results and Discussion			Simulation Outputs and Summary	
8	Conclusion				
9	Appendix I			Source code	
10.	Appendix II			Assignments	

ABSTRACT

Banks make an important contribution to society. Everyone almost has a bank account now. It's an easy and efficient way to manage one's funds. Banks aren't only easy to store and keep track of money, but also send and receive funds. Overall, banks help us to manage our assets and money efficiently in a way which makes us aware of our financial condition. Moreover, we can easily send, receive, and transfer money. Loans are also an important feature of banks. Many people take loans to get hold of assets such as houses, gold, automobiles or even education. Hence the world is run by the smooth functioning of banks and the services provided by them to common people as well as companies.

Companies use banks and their services to pay their employees salaries and to manage taxes.

In today's fast moving world, it's even more important to make the bank services more efficient. This requires making it as fast and automated as possible, requiring minimal manpower. This is the objective of our project. We have created an Artificial Intelligence based chatbot, using the services provided by IBM Watson assistant. This chatbot can be used on any banking website, here we have used a sample website, made using HTML. This chatbot can be used by anyone who visits the website. They can ask questions to the chatbot about general queries, loan queries, make a bank account even. This is like a virtual guide to help access the services of a bank. From giving detailed information about loans, statements etc, it also has answers to basic information regarding banks.

Hence this project is very helpful for anyone who wants to get information about a bank through online mode. It's especially useful for the ones who live far away from banks or have no experience with banking. Students or new employees, who want to get information on banks can easily ask their queries using the chatbot. Getting accurate and precise information about banks is very important for people to decide and manage their finances.

LIST OF CONTENTS

CHAPTER NO.	TITLE OF THE CHAPTER	PAGE NO.
	ABSTRACT	i
	LIST OF TABLES	v
	LIST OF FIGURES	vi
1	INTRODUCTION	1
	1.1 PROJECT OVERVIEW	1
	1.2 PURPOSE	1
2	LITERATURE SURVEY	2
	2.1 EXISTING SOLUTION	2
	2.2 REFERENCE	2
	2.3 PROBLEM STATEMENT DEFINITION	2
3	IDEATION & PROPOSED SOLUTION	3
	3.1 EMPATHY MAP CANVAS	3
	3.2 IDEATION & BRAINSTORMING	4
	3.3 PROPOSED SOLUTION	7
	3.4 PROBLEM SOLUTION FIT	8
4	REQUIREMENT ANALYSIS	9

	4.1 FUNCTIONAL REQUIREMENTS	9
	4.2 NON-FUNCTIONAL REQUIREMENTS	9
5	PROJECT DESIGN	10
	5.1 DATA FLOW DIAGRAM	10
	5.2 SOLUTION & TECHNICAL ARCHITECTURE	10
	5.3 USER STORIES	14
6	PROJECT PLANNING & SCHEDULING	16
	6.1 SPRINT PLANNING & ESTIMATION	16
	6.2 SPRINT DELIVERY SCHEDULE	17
7	CODING & SOLUTIONING	18
	7.1 FEATURE 1	18
	7.2 FEATURE 2	19
8	TESTING	25
	8.1 TEST CASES	25
	8.2 USER ACCEPTANCE & TESTING	25
9	RESULTS	27
	9.1 PERFORMANCE & METRICS	27
10	ADVANTAGES & & DISADVANTAGES	28

11	CONCLUSION	29
12	FUTURE SCOPE	30
13	APPENDIX	31
	SOURCE CODE	31
	GITHUB & LINK	37

LIST OF TABLES

TABLE NO.	TITLE	PAGE NO.
3.1	PROPOSED SOLUTION	
4.1	FUNCTIONAL REQUIREMENTS	
4.2	NON-FUNCTIONAL REQUIREMENTS	
5.1	COMPONENETS AND TECHNOLOGIES	
5.2	APPLICATION CHARACTERISTICS	
5.3	USER STORIES	
6.1	SPRINT PLANNING AND ESTIMATION	
6.2	SPRINT DELIVERY SCHEDULE	

LIST OF FIGURES

FIGURE No.	TITLE	PAGE NO.
3.1	EMPATHY MAP	
3.2	BRAINSTORMING	
3.3	BRAINSTORM AS GROUP	
3.4	IDEA PRIORITIZATION	
3.5	PROPOSED SOLUTION FIT	
5.1	DATA FLOW DIAGRAM	
5.2	TECHNICAL ARCHITECTURE	
7.1	CHATBOT SKILLS	
7.2	GREETINGS ACTION	
7.3	SAVINGS ACCOUNT ACTION	
7.4	SAVINGS ACCOUNT SECOND STEP	
7.5	CURRENT ACCOUNT ACTION	
7.6	CURRENT ACCOUNT DOCUMENTS REQUIRED	
7.7	LOAN ENQUIRY ACTION	
7.8	LOAN ENQUIRY DOCUMENTS REQUIRED	
7.9	GENERAL QUERIES ACTION	
7.10	GENERAL QUERIES RESPONSE	
7.11	NET BANKING ACTION	
7.12	END ACTION	
8.1	SAMPLE WEBSITE PREVIEW	
8.2	CHATBOT PRE	

CHAPTER 1

INTRODUCTION

1.1 PROJECT OVERVIEW

Banking and capital markets outlook offers unique insights and analysis on seven businesses: retail banking, consumer payments, wealth management, commercial banking, transaction banking, investment banking, and market infrastructure. Banking sector plays a crucial role in the functioning and economic development of an economy. In all economic systems, banks play a leading role in planning and implementing financial policy. Banks accept deposits and provide loans and derive a profit from the difference in the interest rates paid and charged to depositors and borrowers respectively. Opening an account with a traditional bank, on the other hand, is much more time-consuming. While some large banks are starting to offer an online application process, the overwhelming majority will require you to visit a branch in-person to start your application. The next major difference between digital and traditional banking is customer service. To state the obvious: customer service for a traditional bank mostly happens in person, whereas digital banking offers online support.

Digital banking is time efficient as it allows you to access most banking services from the comfort of your home. You can save time on travel and convenience. Digital Banking is a great source for people who reside in remote areas where traditional banks may be difficult to access. They are also great for elderly people and working professionals with busy schedules. Often times, customers aren't aware of the procedures of banking so our chatbot provides guidance about this digital banking process in a step by step and user friendly way to the customers.

1.2 PURPOSE

The purpose of this project is to make banking easier for people by creating a chat box that assists customers. Chatbots can help to reduce the dependency of an organisation on humans and also minimize the need for different systems for different processes. The chat box is used to guide a customer to create a bank account and answer loan queries. The Bot should be able to answer general banking queries and queries regarding net banking.

CHAPTER 2

LITERATURE SURVEY

2.1 EXISTING PROBLEM

With the progress in the field technology, everything is being digitalized to reduce human effort. Everyone is looking for an easy and efficient way to get work done and especially on the online mode. Hence, there comes a need for a guide that can help people with creating a bank account on the respective online platform and answer other banking related queries.

2.2 REFERENCES

- [1] S. Gianvecchio, M. Xie, Z. Wu and H. Wang, "*Humans and Bots in Internet Chat: Measurement, Analysis, and Automated Classification*," in IEEE/ACM Transactions on Networking, vol. 19, no. 5, pp. 1557-1571, Oct. 2011.
- [2] A. Abdellatif, K. Badran, D. E. Costa and E. Shihab, "**A Comparison of Natural Language Understanding Platforms for Chatbots in Software Engineering**," in IEEE Transactions on Software Engineering, vol. 48, no. 8, pp. 3087-3102, 1 Aug. 2022.
- [3] T. Terzidou, T. Tsiatsos, C. Miliou and A. Sourvinou, "**Agent Supported Serious Game Environment**," in IEEE Transactions on Learning Technologies, vol. 9, no. 3, pp. 217-230, 1 July-Sept. 2016.
- [4] S. García-Méndez, F. De Arriba-Pérez, F. J. González-Castaño, J. A. Regueiro-Janeiro and F. Gil-Castiñeira, "**Entertainment Chatbot for the Digital Inclusion of Elderly People Without Abstraction Capabilities**," in *IEEE Access*, vol. 9, pp. 75878-75891, 2021.

2.3 PROBLEM STATEMENT DEFINITION

In today's fast moving world, it's even more important to make the bank services more efficient. This requires making it as fast and automated as possible, requiring minimal manpower. Hence the goal is to build a chatbot using Watson's assistant that will be able to guide a customer to create a bank account and answer loan queries. The Bot should be able to answer general banking queries and queries regarding net banking.

CHAPTER 3

IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

An empathy map is a collaborative visualization used to articulate what we know about a particular type of user. It externalizes knowledge about users in order to create a shared understanding of user needs and aid in decision making. Empathy is a critical part of human-centred design. There are endless conversations about its importance in user experience work, but few focus on how to help others achieve it.

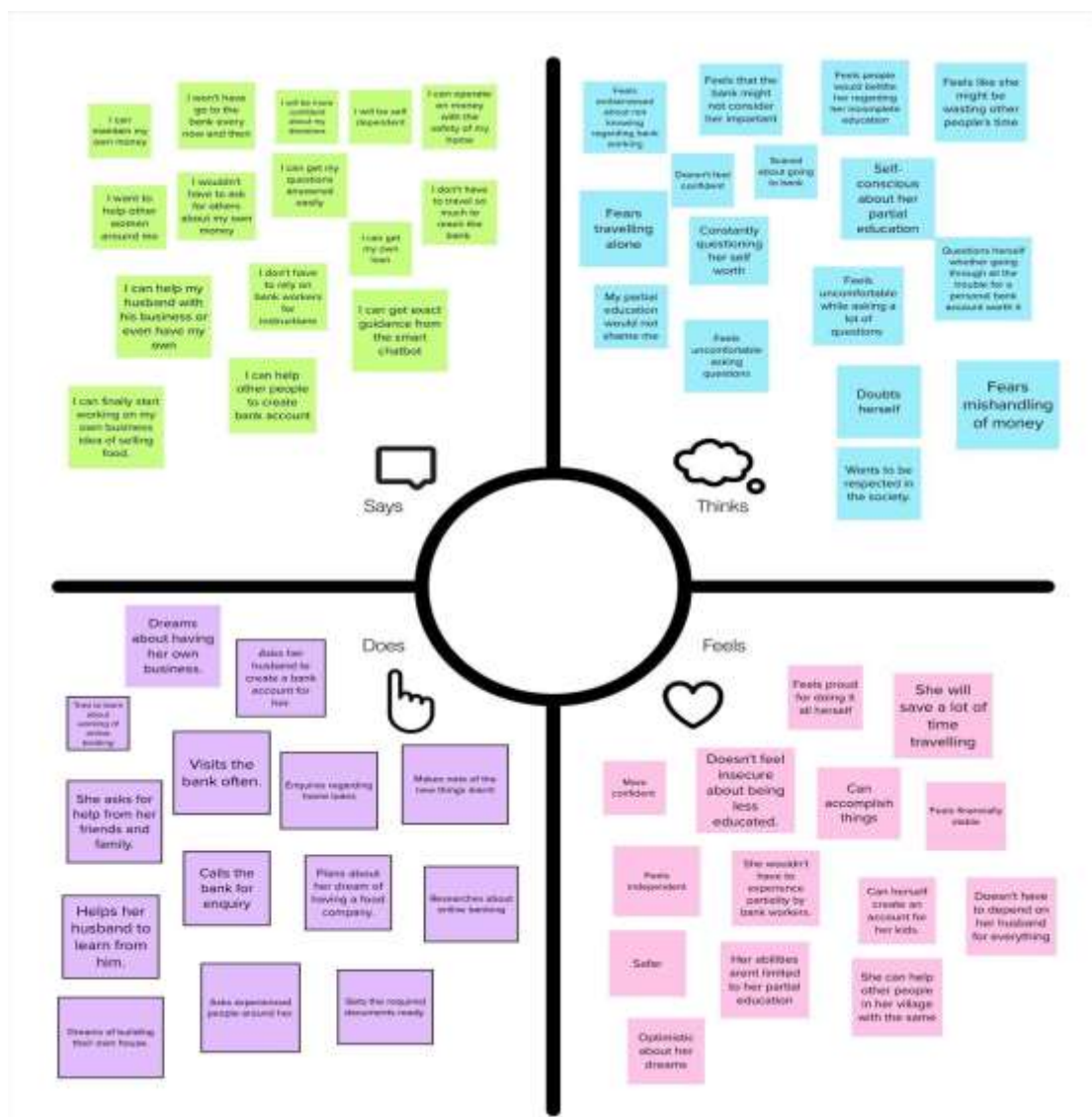


Figure 3.1 Empathy Map

3.2 IDEATION & BRAINSTORMING

Ideation essentially refers to the whole creative process of coming up with and communicating new ideas. Ideation is innovative thinking, typically aimed at solving a problem or providing a more efficient means of doing or accomplishing something. It encompasses thinking up new ideas, developing existing ideas, and figuring out means or methods for putting new ideas into practice.

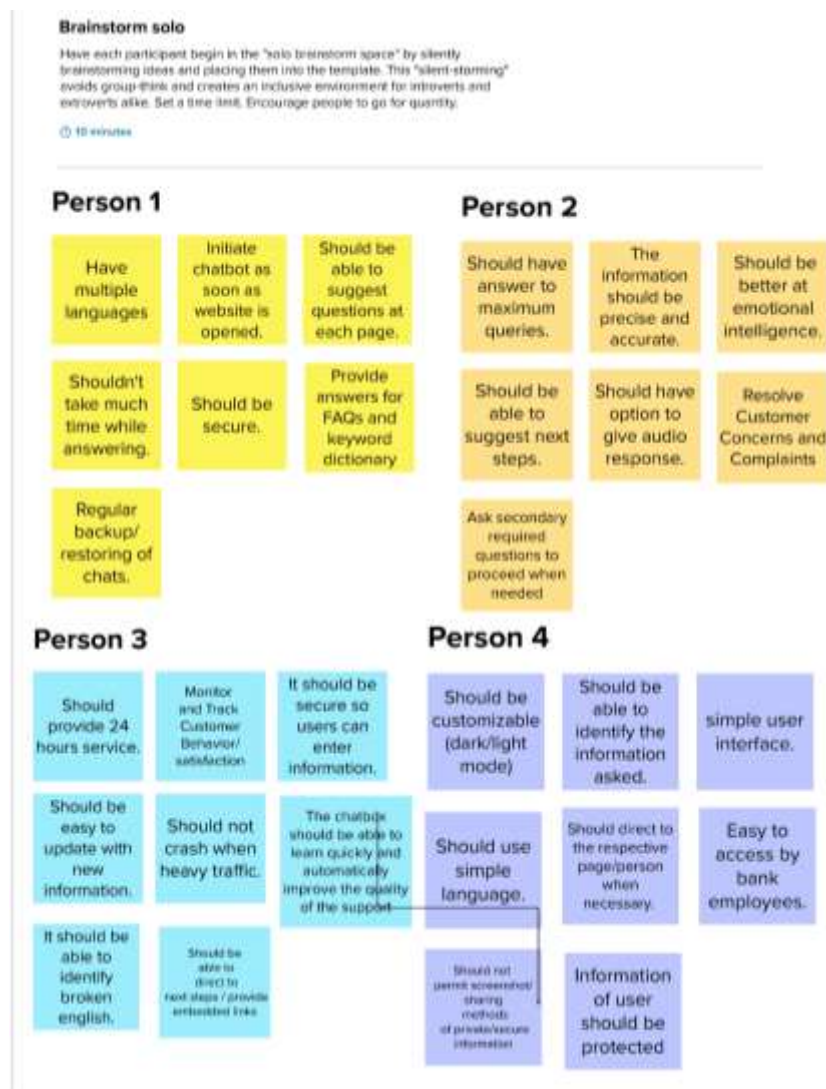


Figure 3.2 Brainstorm

3

Brainstorm as a group

Take turns sharing your ideas while clustering similar or related notes as you go. In the last 10 minutes, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you can break it up into smaller sub-groups.

TIP

You can use the **Velcro** website tool above to focus on the strongest ideas.

15 minutes

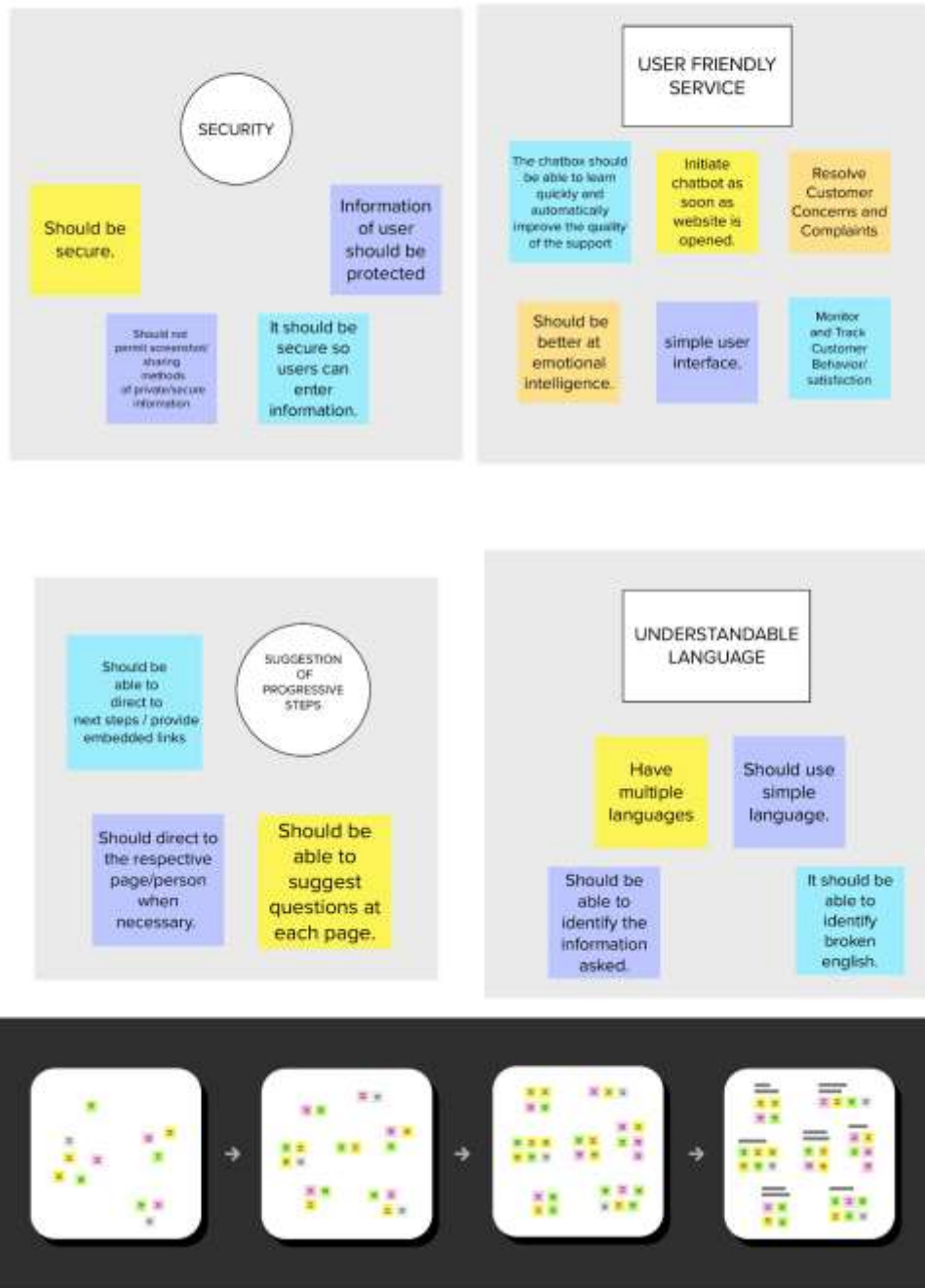


Figure 3.3 Brainstorm as a group

Step-3: Idea Prioritization

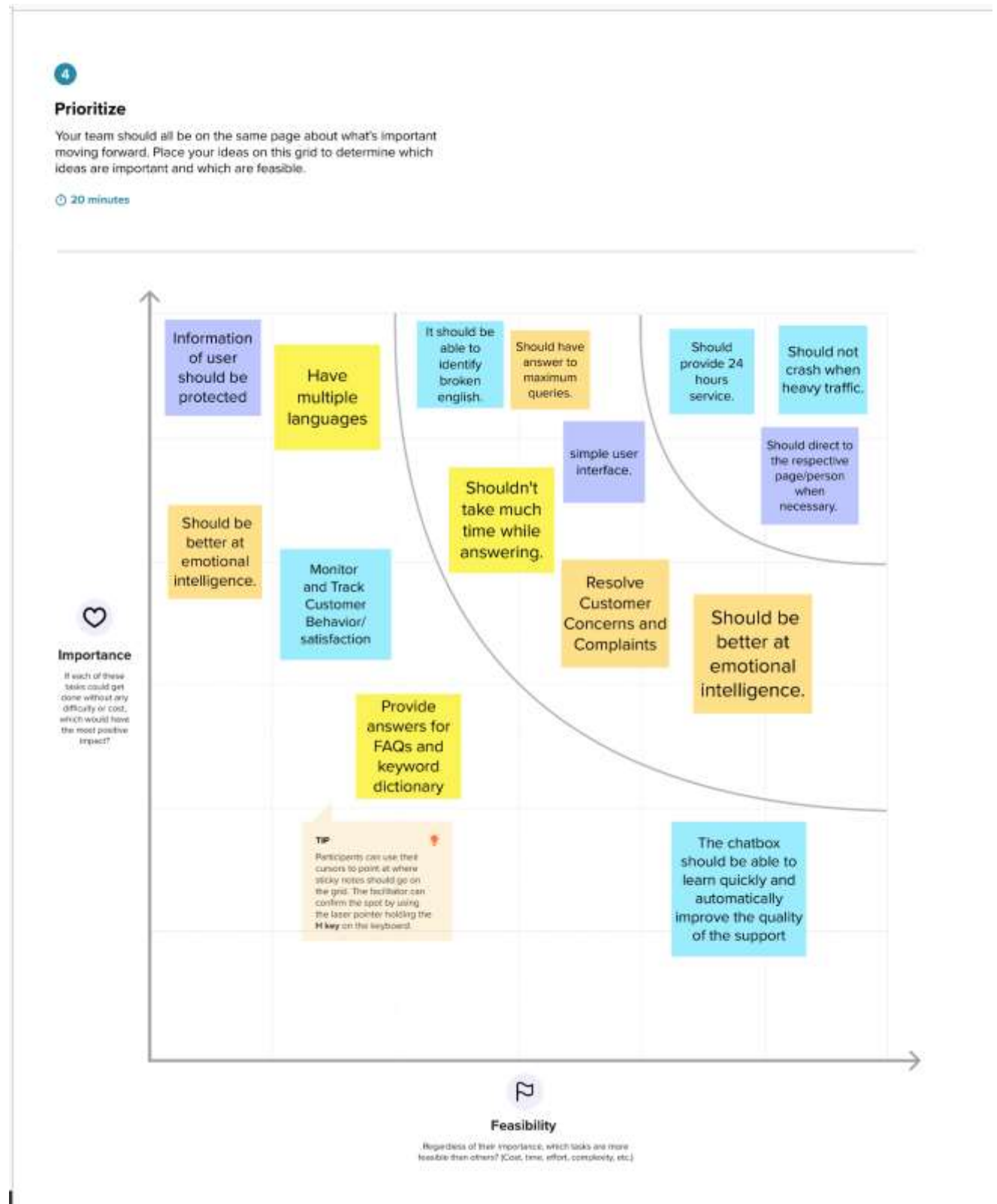





Figure 3.4 Idea prioritization

3.3 PROPOSED SOLUTION

S. No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	With the progress in the field technology, everything is being digitalized to reduce human effort. Everyone is looking for an easy and efficient way to get work done and especially on the online mode. Hence, there comes a need for a guide that can help people with creating a bank account on the respective online platform and answer other banking related queries.
2.	Idea / Solution description	Banking is one of those industries where everyone has a part in, be it rich or poor. Everyone has a bank account or wants to create one. Being the technologically forward world it is, everyone is looking to get tasks done at the comfort of their homes. So, online banking is required. Using AI, we can answer all the related questions accurately and provide precise information. A person can use the chat bot to create a bank account without having to physically travel to the bank, so it's safer and easier.
3.	Novelty / Uniqueness	We use the chat bot to solve the doubts and queries of the customers regarding the bank activities.
4.	Social Impact / Customer Satisfaction	Extremely convenient, user friendly, time saving and remote friendly.
5.	Business Model (Revenue Model)	Chatbot can be used to make the user experience convenient and this would increase the bank users. This allows users to speak their preferences and present an appropriate list of options.
6.	Scalability of the Solution	The chat bot can be further developed to improve the efficiency and performance by including multiple language answering and employment of audio features.

Table 3.1 Proposed solution

3.4 PROBLEM SOLUTION FIT

Define CS, fit into CC	1. CUSTOMER SEGMENT(S)  <p>Our customers are first time account creators, business persons, anyone who is far away from bank and persons unable to reach bank.</p>	6. CUSTOMER CONSTRAINTS  <p>Waiting time at bank, Unaware of procedures, distance from bank.</p>	5. AVAILABLE SOLUTIONS  <p>Reaching bank even if delayed, Asking help to known persons/ Bank persons.</p>





3. TRIGGERS  <p>When customers want to create bank account, need help in loan /general banking queries.</p>	10. YOUR SOLUTION  <p>Our chatbox will be available for all day 24 hours.</p> <p>It will provide assistance in all languages and also identify broken English.</p> <p>Respond to maximum number of queries.</p> <p>Respond quickly without delay.</p>	8. CHANNELS of BEHAVIOUR  <p>8.1 ONLINE Enable internet and choose chatbox or googling.</p> <p>8.2 OFFLINE Approach bank, Ask known persons.</p>
4. EMOTIONS: BEFORE / AFTER  <p>Confused, insecure, nervous, tired > Confident, less pressured, clear thoughts, relaxed, satisfied.</p>		

Figure 3.5 Proposed solution fit

CHAPTER 4

REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	<ul style="list-style-type: none">• Registration through email
FR-2	User Confirmation	<ul style="list-style-type: none">• Confirmation via Email• Confirmation via OTP
FR-3	User friendly	<ul style="list-style-type: none">• Generates the message• Protect the privacy• Available for 24 hrs• Multiple languages are available
FR-4	User support	<ul style="list-style-type: none">• Provide answer for FAQ and keyword dictionary.• Learn quickly automatically improve the quality of the support.• Resolve customer concerns and complaints.

Table 4.1 Functional requirements

4.2 NON-FUNCTIONAL REQUIREMENTS:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Linguistic based, voice bots are available.
NFR-2	Security	Privacy protected.
NFR-3	Reliability	Perform the service dependently and accurately.
NFR-4	Performance	Respond quickly without any delay.
NFR-5	Availability	Should provide the service for 24 hours.
NFR-6	Scalability	Improve the efficiency and performance by including multiple language answering and employment of audio features.

Table 4.2 Non-functional requirements

CHAPTER 5

PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS

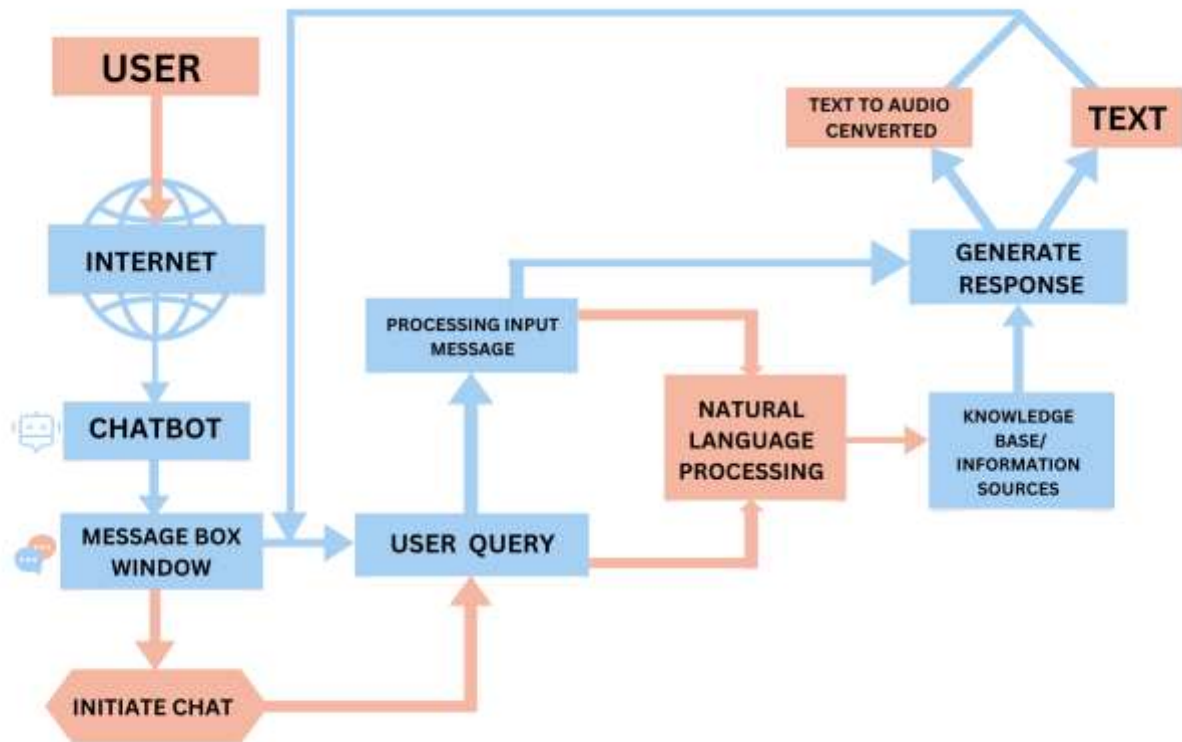


Figure 5.1 Dataflow diagram

5.2 SOLUTION AND TECHNICAL ARCHITRCTURE

Technical Architecture Steps:

1. User queries to the Chat Bot
2. Bot previews the query
3. Query is transferred to Watson Assistant
4. Natural Processing Language is used to understand the query
5. Watson Assistant sends the query
6. Watson finds the relevant response from cloud database
7. Queries and responses (sent and received) is stored in clouddatabase
8. All queries and related information is sent to the bank for improvement

Technical Architecture:

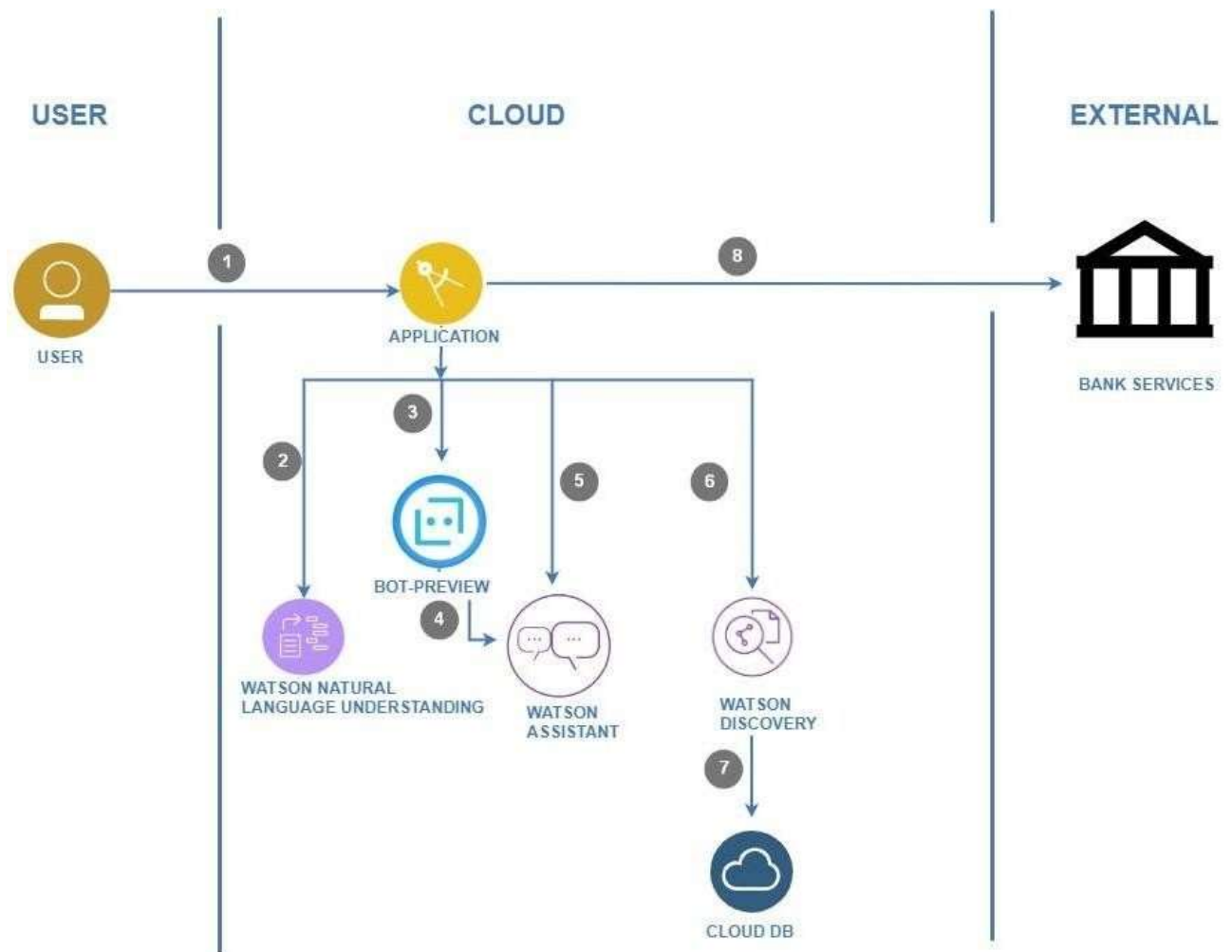


Figure 5.2 Technical architecture

S.N o	Component	Description	Technology
1.	Bot Preview	A simple page is presented to the user with a chat layout that has an input box field available to get user queries and preset options are presented for the user to select.	HTML, CSS, JavaScript
2.	Application Logic-1	An input bar is provided that enables the user to type queries.	Java / Python
3.	Application Logic-2	Regularly asked queries or options are presented to the user.	IBM Watson STT service
4.	Application Logic-3	Processes responses to custom queries and displays a relevant response.	IBM Watson Assistant
5.	Cloud Database	Queries and answers to queries are stored in the cloud and are accessed whenever a query is asked.	IBM Cloudant DB
6.	External API-1	It provides an interface between the application and the cloud to send the query from the application to the cloud.	Watson Assistant v2 API
7.	External API-2	A cloud based API that supports several cloud based applications and operations.	IBM Cloud API
8.	Deep Learning Model	It is trained with several queries and uses that knowledge to provide relevant responses to queries with a good enough accuracy.	Deep Learning
9.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Flask Application Cloud Server Configuration: IBM Cloud	Python Flask, IBM Cloud

Table 5.1 Components and technologies

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Python Flask, CSS Frameworks
2.	Security Implementations	General access control and the built-in security features of IBM Cloud are present.	IBM Watson Assistant, IBM Cloudant DB
3.	Scalable Architecture	The architecture consists of three tiers, the client side, the web server and the cloud server. Each of these can be scaled as per requirements.	Client Side: Flask (Python) Web Server: IBM Watson Assistant Cloud Server: IBM Cloud
4.	Availability	The chatbot is available 24/7 on almost all devices that support an internet browser.	IBM Cloud, Flask (Python)
5.	Performance	Responds to several thousands of queries at the same time.	IBM Load Balancer, IBM Cloud

Table 5.2 Application Characteristics

5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Web user)	Registration	USN-1	As a user, I will be able to register/sign in independently and gain access to the system and a confirmation of the same will be received in my email.	I can access my account. I can receive confirmation email & click confirm.	High	Sprint-1
	Login	USN-2	As a user, I can login to my account whenever needed.	I access to my account by authentically logging in.	High	Sprint-1
	Verification	USN-3	As a user, I will be verified by OTP during my login process.	The access to my account will be secured.	High	Sprint-1
	Accounts	USN-4	As a user, I can view my account details, view my transaction history, procedures for opening/closing account, online transactions, currency conversion, card replacement.	I can get complete guidance of my accounts and banking details and can submit my details if needed.	High	Sprint-1&2

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
			investment and deposit details, interest rates, taxes, cyber security, internet banking.	needed for further procedures,		
	Loans	USN-5	As a user, I can get guidance regarding applications and usage procedures of loans like Home Equity Loans, Auto Loans, Personal Loans.	I can clear my queries regarding loans.	Medium	Sprint 1 & 2
	General Queries	USN-6	As a user, I can clarify my general queries regarding deposits, accounts changing, internet banking, cards, transfers, retrieval of old details, guarantees and consultancy.	I can clear my queries regarding all the banking services provided by the bank.	Medium	Sprint-1
Administrator		USN 7	As an admin, I can modify, update about the new information to the chatbox	I can modify, update responses of the chatbot.	Medium	Sprint 1

Table 5.3 User stories

CHAPTER 6

PROJECT PLANNING & SCHEDULING

6.1 SPRINT PLANNING & ESTIMATION

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register via website by entering my email, password, and confirming my password.	20	High	Uma Priya Selvam Shivani singh
Sprint-1		USN-2	As a user, I will receive confirmation OTP via email notification. Once I have registered for the application.	10	High	Mythily A Manshi Mithra T
Sprint-2	Saving account related details	USN-3	As a user, I can select types of saving account to get details regarding the documents required for creating the saving account	20	Low	Uma Priya Selvam Manshi Mithra T
Sprint-1		USN-4	As a user, I can check the interest rates and minimum balance of saving account	5	Medium	Shivani Singh Mythily A
Sprint-3	Loan account related details		As a user, I can choose the specific type of loans get details regarding it.	10	High	Shivani Singh Manshi Mithra T
			As a user, I can check the loan amounts and check the current status of loan for my loan account	20	High	Mythily A Shivani Singh
Sprint -4	General queries	USN-5	As a user, I can clarify my general queries regarding deposits, accounts changing, internet banking, cards, transfers, retravel of old details, guarantees and consultancy.	10	High	Uma Priya Selvam Manshi Mithra. T
Sprint -5	Administrator		As an admin I can modify, update about the new information to the chatbot		High	Uma Priya Selvam Mythily A

Table 6.1 Sprint planning and estimation

6.2 SPRINT DELIVERY SCHEDULE

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as Planned on End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

Table 6.2 Sprint delivery schedule

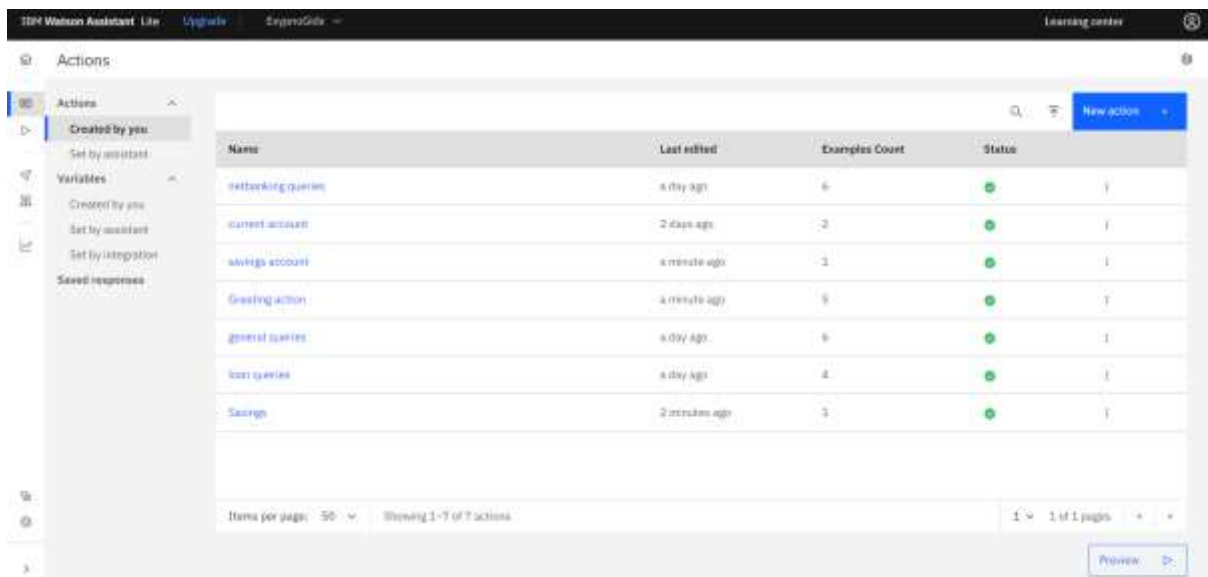
CHAPTER 7

CODING AND SOLUTION

7.1 Feature 1

A chatbot using IBM Watson assistant is created. For this purpose, first an IBM cloud account was created and using that, Watson assistant was created in the Artificial intelligence domain.

- Chatbot Skills created



The screenshot shows the 'Actions' page in the IBM Watson Assistant interface. The page has a dark header with 'IBM Watson Assistant', 'Life', 'Upgrade', and 'EngageGels' on the left, and 'Learning center' on the right. A left sidebar contains navigation options: 'Actions' (selected), 'Variables', and 'Seeded responses'. The main area displays a table of actions with columns: Name, Last edited, Examples Count, and Status. A 'New action' button is in the top right. The table lists seven actions, all with a status of 'I' (Inactive). At the bottom, there is a pagination bar showing 'Items per page: 50', 'Showing 1-7 of 7 actions', and '1 of 1 pages'.

Name	Last edited	Examples Count	Status
netbanking queries	a day ago	6	I
current account	2 days ago	2	I
savings account	a minute ago	1	I
Greeting action	a minute ago	9	I
general queries	a day ago	6	I
loan queries	a day ago	4	I
Savings	2 minutes ago	3	I

Figure 7.1 Chatbot skills

- Greetings action:

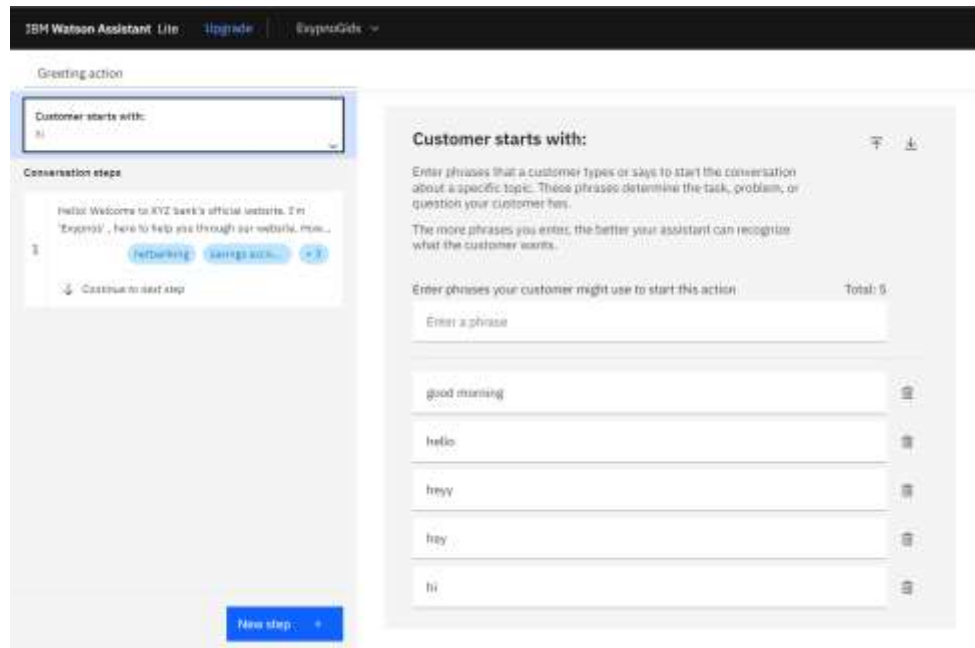


Figure 7.2 Greetings action

7.2 Feature 2

- Savings account

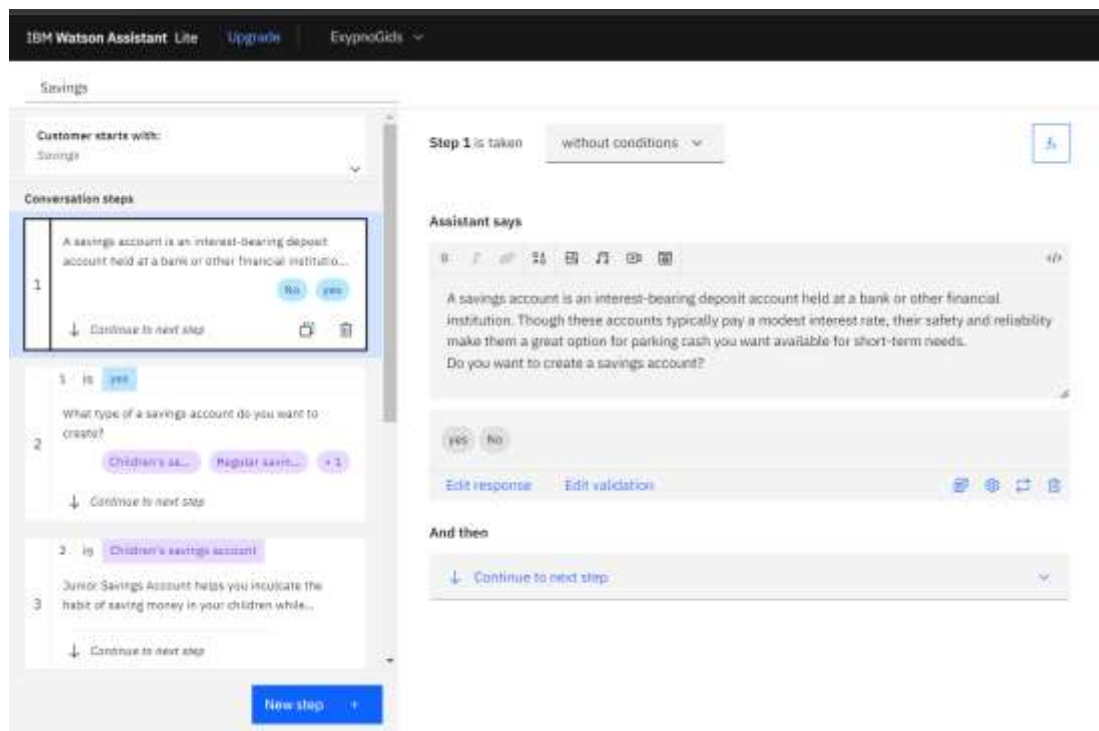


Figure 7.3 Savings account action

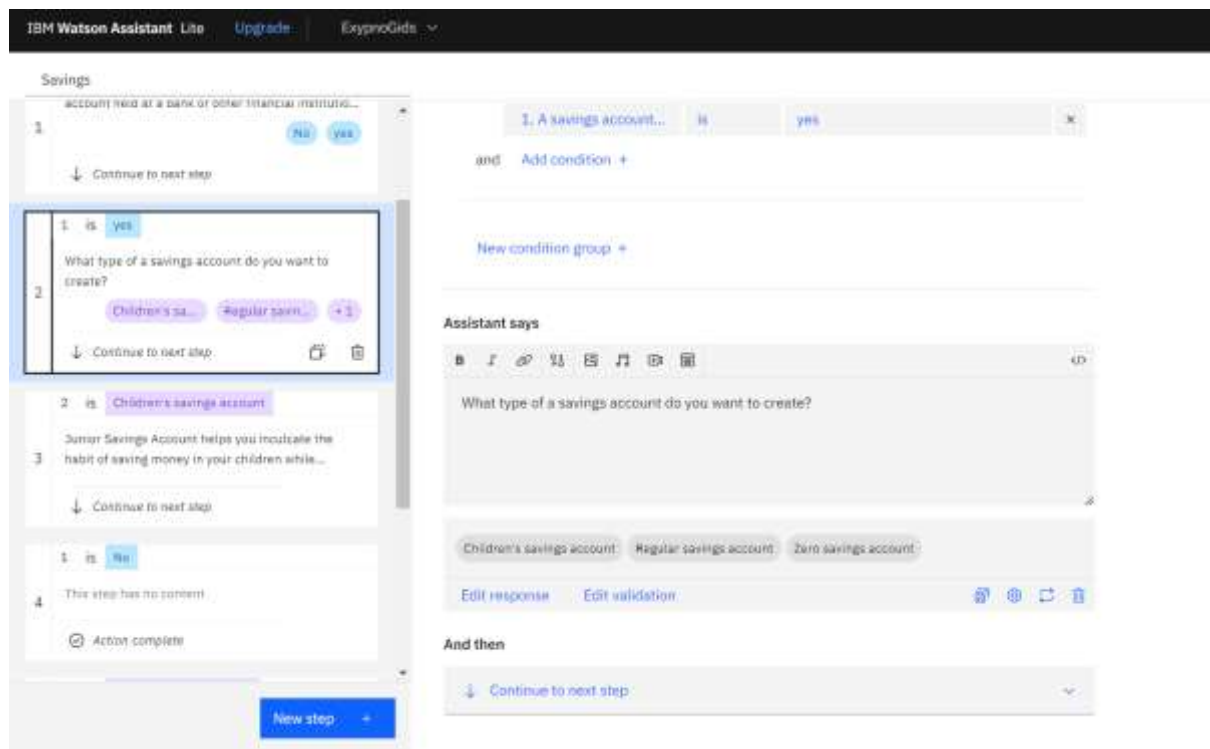


Figure 7.4 Savings account second step

- Current account action

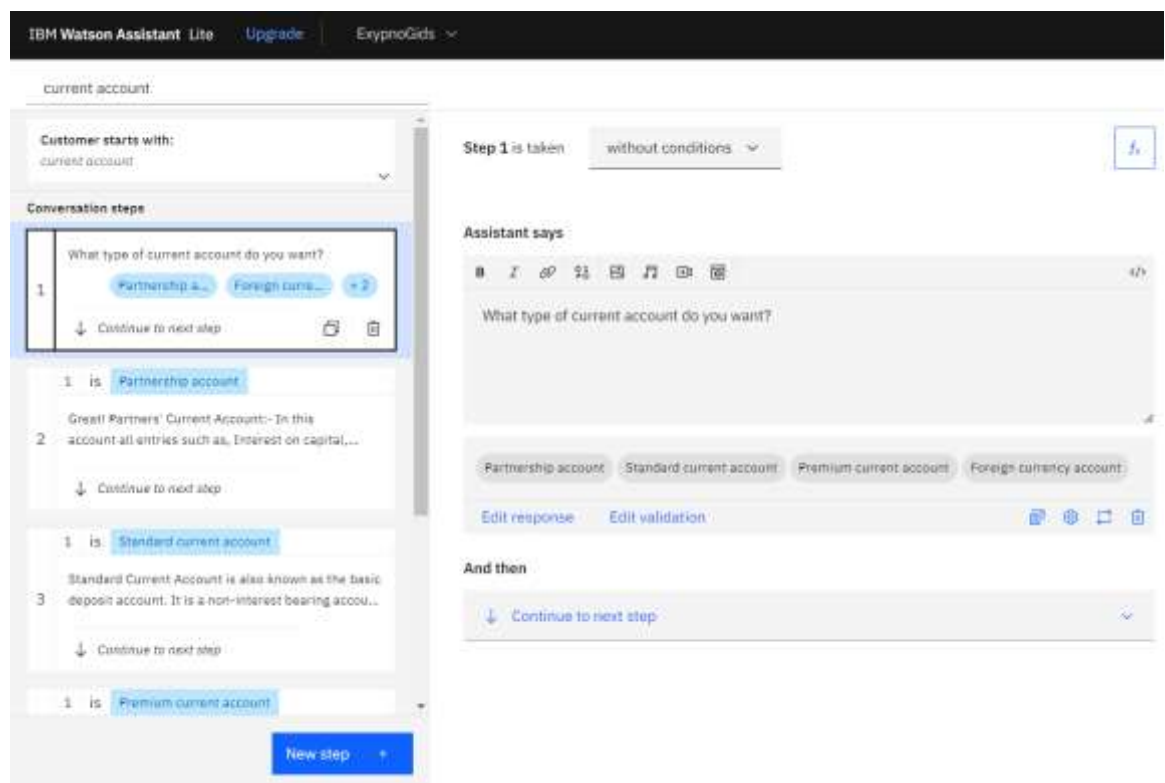


Figure 7.5 Current account action

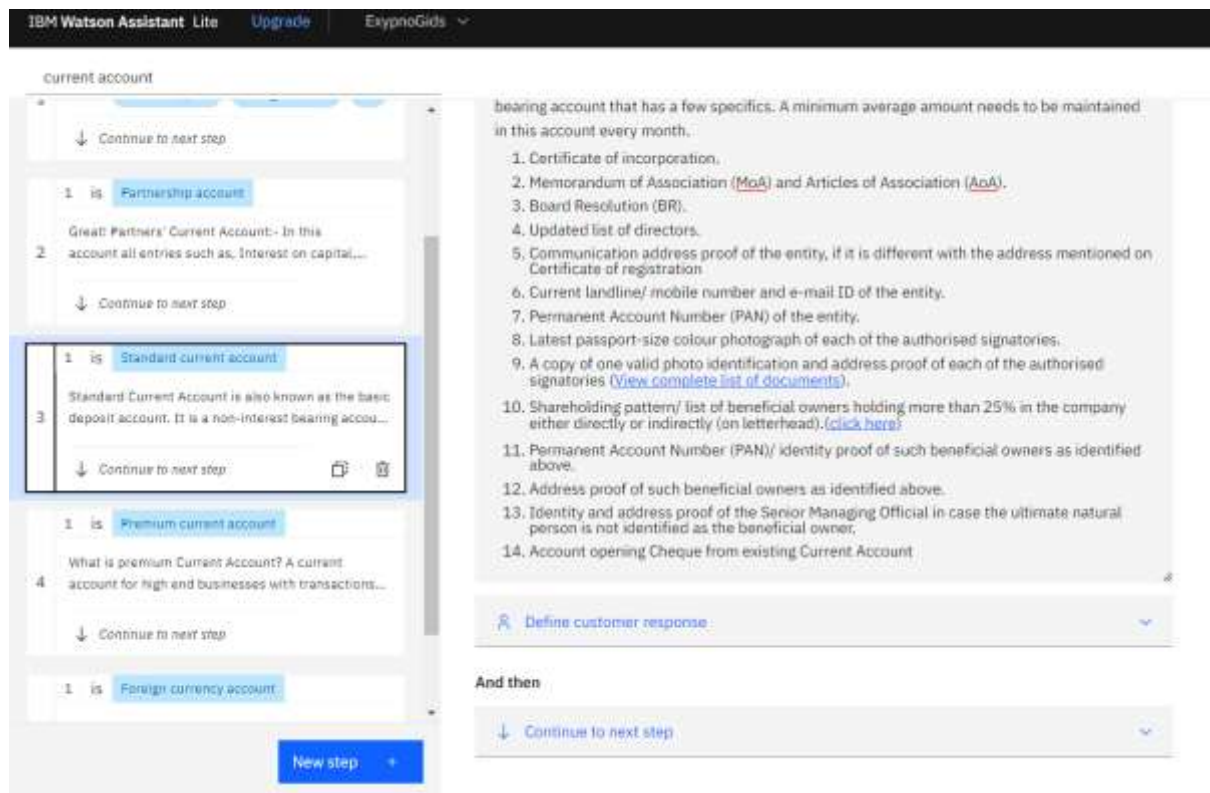


Figure 7.6 Current account documents required

- Loan enquiry action

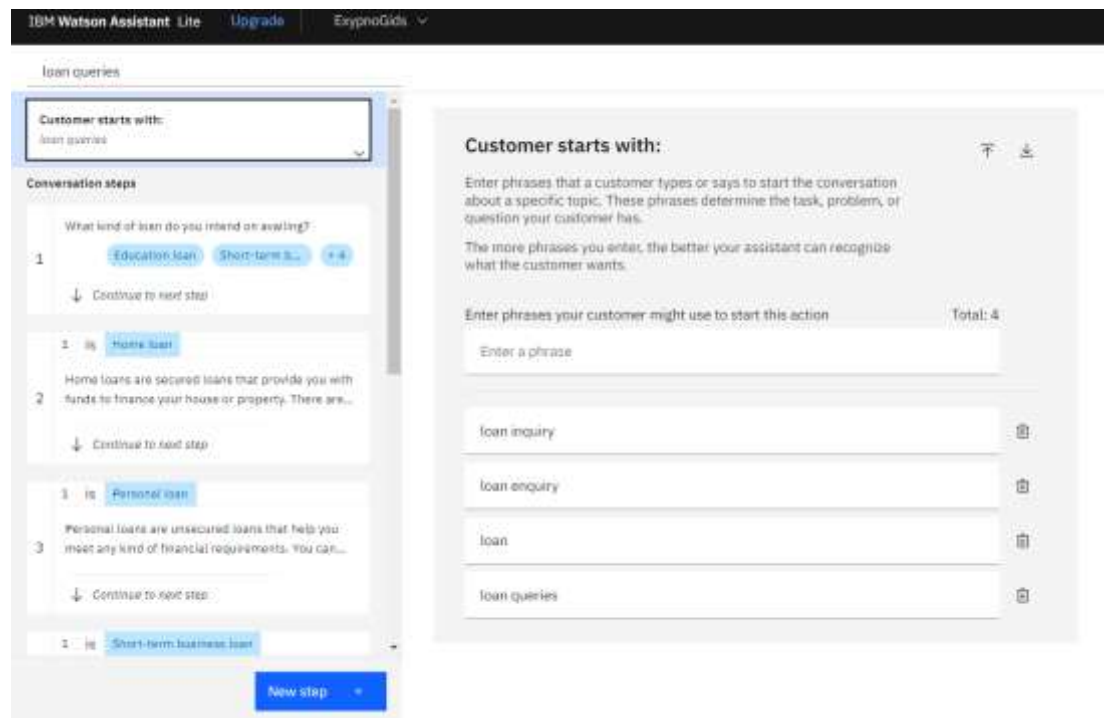


Figure 7.7 Loan enquiry action

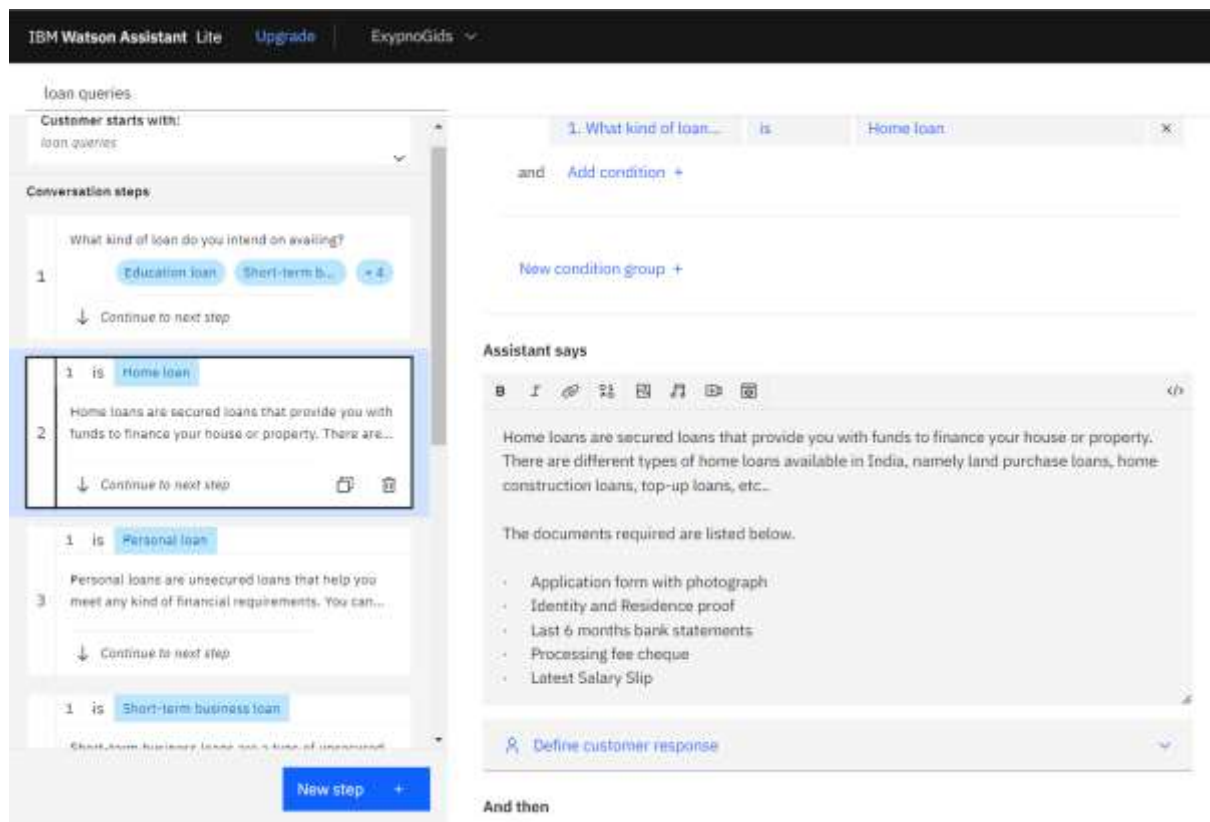


Figure 7.8 Loan enquiry documents required

- General queries

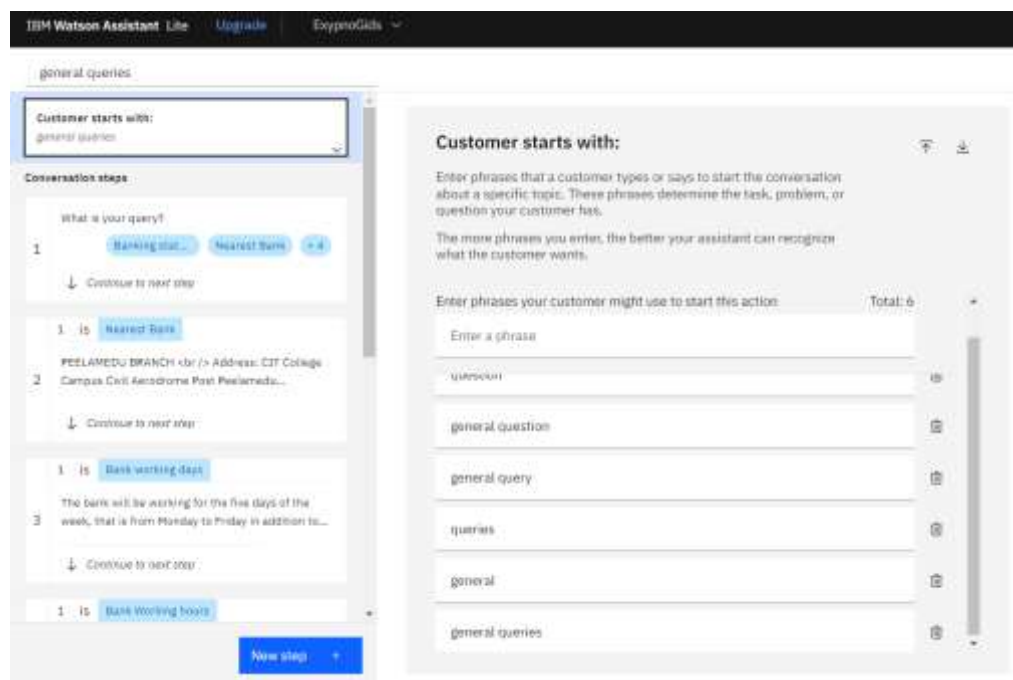


Figure 7.9 General queries action

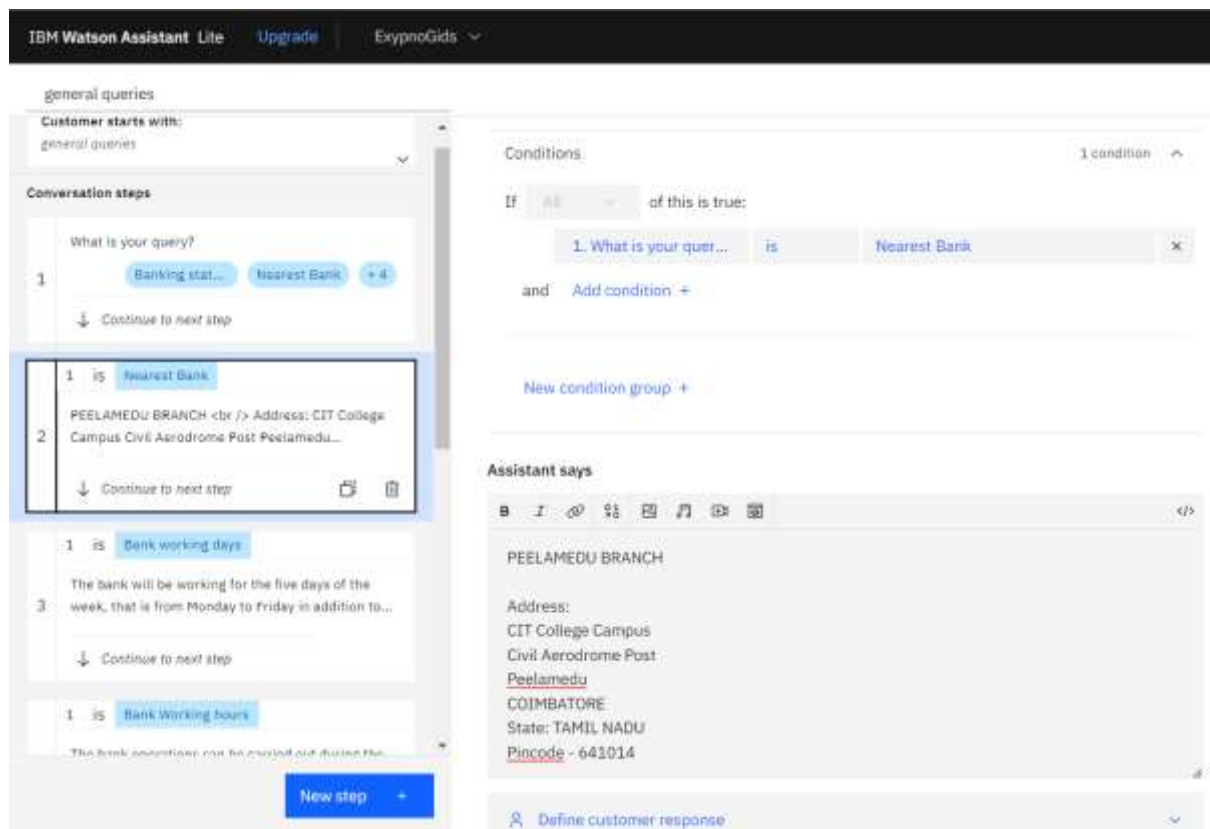


Figure 7.10 General queries response

- Net banking action

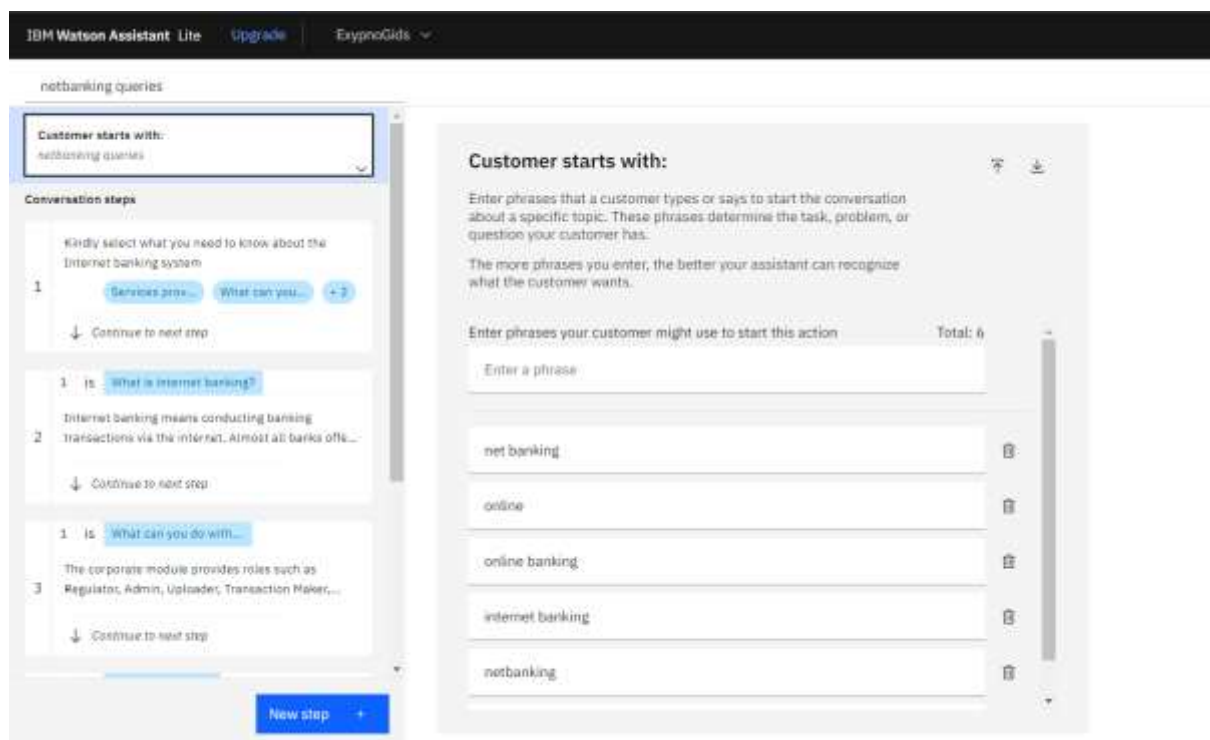


Figure 7.11 Net-banking action

- End action

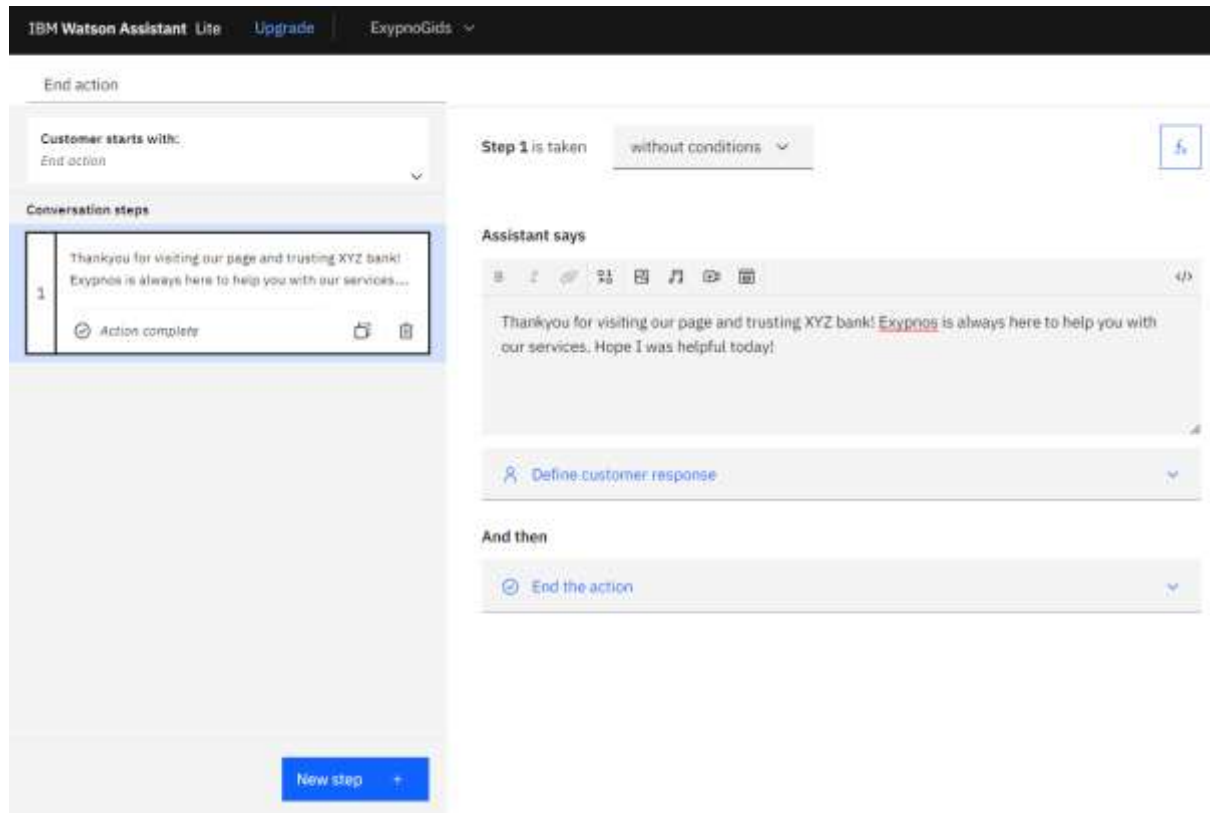


Figure 7.12 End action

CHAPTER 8

TESTING

8.1 TEST CASES

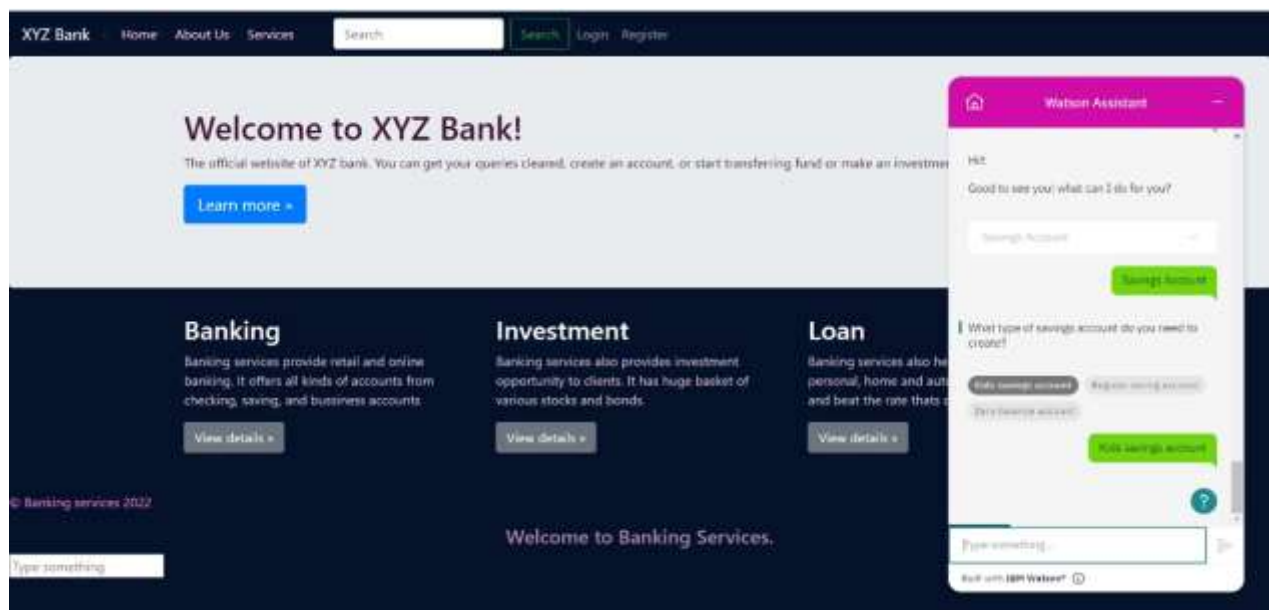
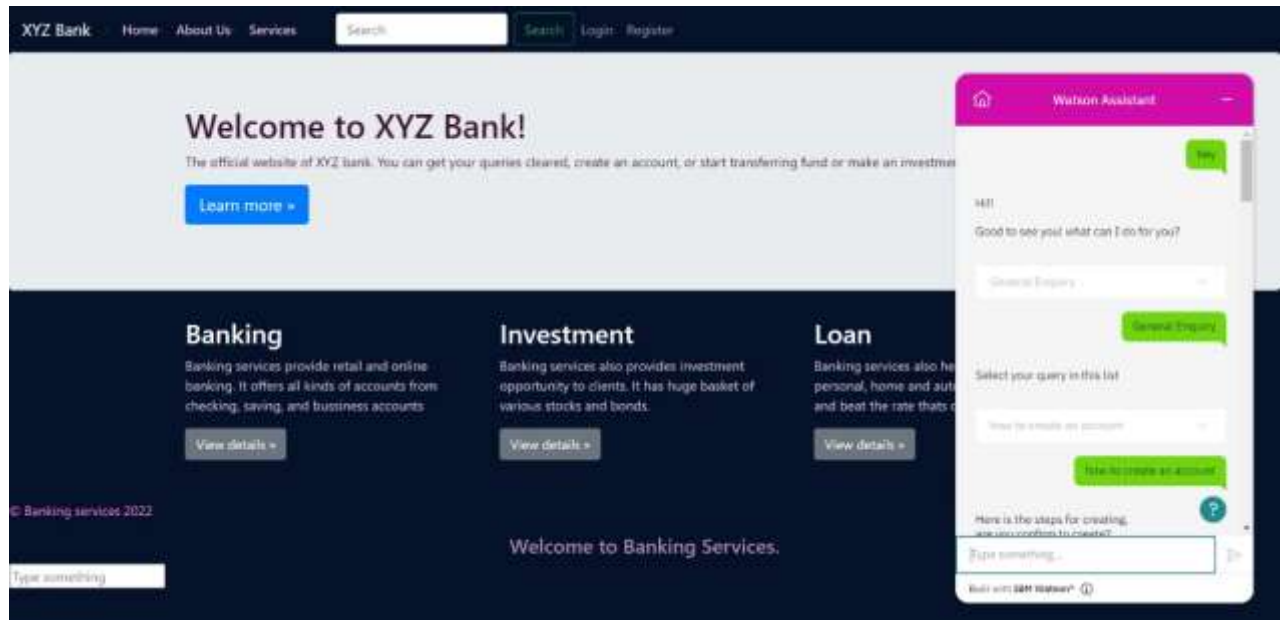


Figure 8.1 Sample website second preview

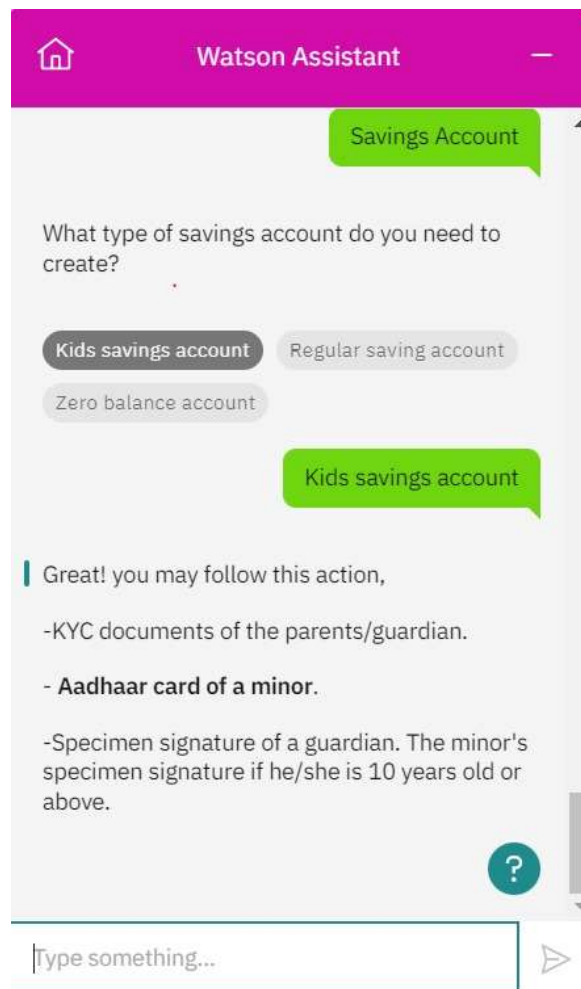


Figure 8.2 Chatbot preview

CHAPTER 9

RESULTS

9.1 PERFORMANCE METRICS

Performance metrics are defined as figures and data representative of an organization's actions, abilities, and overall quality. There are many different forms of performance metrics, including sales, profit, return on investment, customer happiness, customer reviews, personal reviews, overall quality, and reputation in a marketplace. Performance metrics can vary considerably when viewed through different industries.

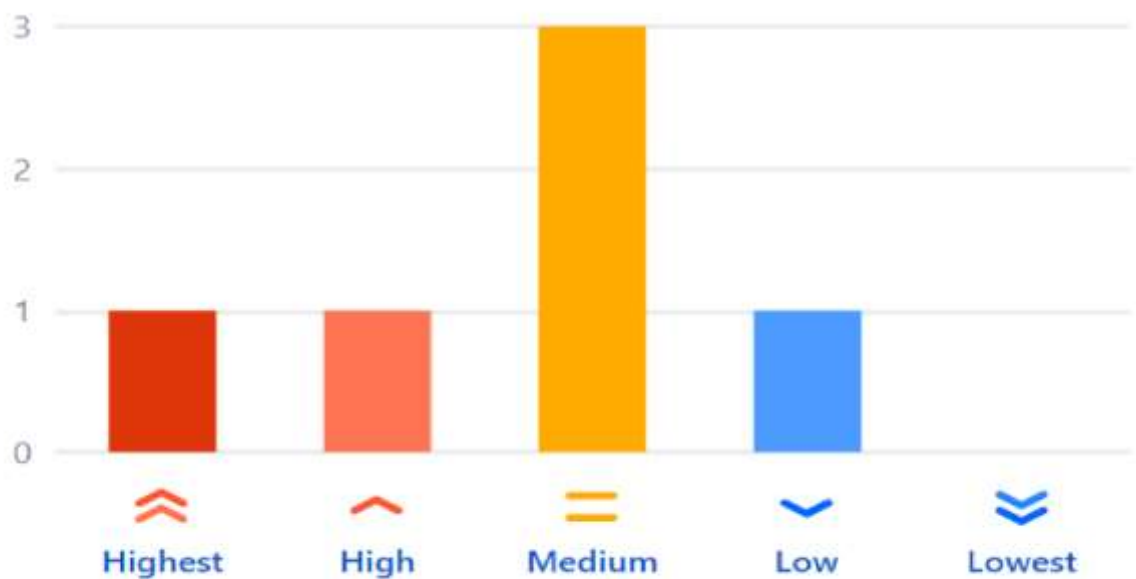


Figure 9.1 Performance metrics

CHAPTER 10

ADAVANTAGES AND DISADVANTAGES

ADVANTAGES:

- 24*7 Availability- Customer service at any time
- Reduce Errors
- Reduces Operational Costs
- Answers all queries with accuracy.
- Fast response
- Consumes time
- Helps to take loans, create accounts

DISADVANTES:

- Needs Analyzing
- May crash at times of heavy traffic
- Needs Maintenance
- Can handle only basic queries
- Needs good network connectivity.

CHAPTER 11

CONCLUSION

11.CONCLUSION

Banking bots are proving to be extremely helpful in providing seamless customer service. In fact, chatbots are also helpful in analysing

data, detecting fraud, and capturing data. Automation enables the chatbot to inform the user about every transaction to prevent any form of miscommunication or mismanagement. This helps in preventing any kind of fraud by identifying possible discrepancies right from the initial stage. Chatbots are able to handle more conversations with customers at a lower cost. The bots can provide assistance to the customers at any time as they are trained to grasp their queries and provide the best possible solution, simultaneously making them feel like they are interacting with a human. While chatbots provide many benefits to organizations in the banking industry, there are some drawbacks.

CHAPTER 12

FUTURE SCOPE

- The share of banks that use AI solutions and chatbots in particular is constantly rising. As another factor, the use of smartphones and other smart devices is also a rapidly growing trend. These two driving forces determine the near future of artificial intelligence assistants in the banking industry.
- More and more banks tend to integrate chatbots into their mobile apps. This is a convenient way to stay in touch with their clients and, at the same time, reduce the involvement of human personnel.
- The quality of chatbots will definitely improve over the next few years. They will become more “human,” and will learn to interpret requests much better. As a further development, chatbots will predict human behavior more accurately and use this information for self-learning.
- In the nearest years, we will definitely see the rise of voice assistants in all fields, including the banking sector. For example, they will greatly speed up the process of communication with clients. The supported functionality will also grow and will result in more use cases for chatbots.

Security concerns regarding the use of chatbots in the banking industry will persist in the future. The need for well-protected and reliable AI solutions will become a major driving force of digital technologies development. The reason is simple: people will agree to share their private information and access to their credit cards only with the most protected and trustworthy software solutions, including chatbots.

13. APPENDIX

SOURCE CODE

```
<html>

<head>

<script>

window.watsonAssistantChatOptions = {

  integrationID: "5308436f-fc25-4c3f-8abb-305916aba969", // The ID of this integration.

  region: "us-south", // The region your integration is hosted in.

  serviceInstanceID: "0e12d8d0-8932-4290-89ec-89d8761d091d", // The ID of your service instance.

  onLoad: function(instance) { instance.render(); }

};

setTimeout(function(){

  const t=document.createElement('script');

  t.src="https://web-chat.global.assistant.watson.appdomain.cloud/versions/" +

(window.watsonAssistantChatOptions.clientVersion || 'latest') + "/WatsonAssistantChatEntry.js";

  document.head.appendChild(t);

});

</script>

  <base href="/">

  <title>Banking Services</title>

  <meta charset="utf-8">

  <meta name="viewport" content="width=device-width, initial-scale=1">

  <meta http-equiv="X-UA-Compatible" content="IE=edge">

  <meta property="og:image" content="conversation.svg" />

  <meta property="og:title" content="Conversation Chat Simple" />

  <meta property="og:description"

      content="Sample application that shows how to use the Conversation API to identify

user intents" />

  <link rel="shortcut icon" href="favicon.ico" type="image/x-icon">

  <link rel="stylesheet"

href="https://maxcdn.bootstrapcdn.com/bootstrap/4.0.0/css/bootstrap.min.css"
```

```

        integrity="sha384-
Gn5384xqQ1aoWXA+058RXPxPg6fy4IWvTNh0E263XmFcJISAwIGgFAW/dAiS6JXm"
crossorigin="anonymous">

    <link rel="stylesheet" href="css/app.css">

    <style type="text/css">

        body {

            padding-top: 3.5rem;

        }

    </style>
</head>

<body style="background-color:rgb(6, 19, 42);">

    <nav class="navbar navbar-expand-md navbar-dark fixed-top bg-">

        <a class="navbar-brand" href="#">XYZ Bank</a>

        <button class="navbar-toggler" type="button" data-toggle="collapse" data-
target="#navbarsExampleDefault"

            aria-controls="navbarsExampleDefault" aria-expanded="false" aria-
label="Toggle navigation">

            <span class="navbar-toggler-icon"></span>

        </button>

        <div class="collapse navbar-collapse" id="navbarsExampleDefault">

            <li class="nav-item active">

                <a style="color:rgb(251, 202, 245);",class="nav-link"
href="#">Home <span class="sr-only">(current)</span></a>

            </li>

            <li class="nav-item">

                <a style="color:rgb(251, 202, 245);",class="nav-link"
href="aboutus.html">About Us</a>

            </li>

            <li class="nav-item dropdown">

```

```

        <a style="color:rgb(251, 202, 245);",class="nav-link dropdown-
toggle" href="#" id="dropdown01" data-toggle="dropdown"

        aria-haspopup="true" aria-
expanded="false">Services</a>

        <div class="dropdown-menu" aria-labelledby="dropdown01">

            <a class="dropdown-item" href="#">Banking</a>

            <a class="dropdown-item" href="#"></a>

            <a class="dropdown-item" href="#">Home Loan</a>

        </div>

    </li>

</ul>

<span style="white-space: pre">    </span>

<form class="form-inline my-2 my-lg-0">

    <input class="form-control mr-sm-2" type="text" placeholder="Search"
aria-label="Search">

    <button class="btn btn-outline-success my-2 my-sm-0"
type="submit">Search</button>

</form>

<ul class="navbar-nav navbar-right">

    <li class="nav-item">

        <a class="nav-link" href="#">Login</a>

    </li>

    <li class="nav-item">

        <a class="nav-link" href="#">Register</a>

    </li>

</ul>

</div>

</nav>

<main role="main">

    <!-- Main jumbotron for a primary marketing message or call to action -->

    <div class="jumbotron">

```

```

<div style="color:rgb(57, 15, 45);" class="container">
    <h1 display="3">Welcome to XYZ Bank!</h1>
    <p><font-style: italic;></font-style>The official website of XYZ bank. You
can get your queries cleared, create an account, or start transferring fund or make an investment!</p>
    <p><a class="btn btn-primary btn-lg" href="#" role="button" >Learn
more &raquo;</a></p>
</style>
</div>
</div>

```

```

<div class="container">
    <!-- Example row of columns -->
    <div class="row">
        <div class="col-md-4">
            <h2 style="color:rgb(255, 254, 254);">Banking</h2>
            <p style="color:rgb(220, 198, 214);">Banking services provide
retail and online banking. It offers all kinds of accounts from
                checking, saving,
                and bussiness accounts
            </p>
            <p><a class="btn btn-secondary" href="#" role="button">View
details &raquo;</a></p>
        </div>
        <div class="col-md-4">
            <h2 style="color:rgb(255, 254, 254);">Investment</h2>
            <p style="color:rgb(220, 198, 214);">Banking services also
provides investment opportunity to clients. It has huge basket of
                various stocks and bonds. </p>
            <p><a class="btn btn-secondary" href="#" role="button">View
details &raquo;</a></p>
        </div>
        <div class="col-md-4">
            <h2 style="color:rgb(255, 254, 254);">Loan</h2>

```

```

        <p style="color:rgb(220, 198, 214);">Banking services also helps
you find loan for personal, home and auto. We provide best rate

        and beat the rate thats out in the market.</p>

        <p><a class="btn btn-secondary" href="loan.html"
role="button">View details &raquo;</a></p>

    </div>

</div>

<hr>

</div> <!-- /container -->

</main>

<footer style="color:rgb(240, 138, 222);" container">

    <p>&copy; Banking services 2022</p>

</footer>

<div id="contentParent" class="responsive-columns-wrapper">

    <div chat-column-holder" class="responsive-column content-column">

        <div class="chat-column">

            <div id="scrollingChat">


                <h4 style="color:rgb(170, 138, 168) ;"><center>Welcome to
Banking Services.</center></h4>

                </div>

                <label for="textInput" class="inputOutline">

                    <input id="textInput" class="input responsive-column"
class="form-control form-control-lg" placeholder="Type something" type="text"

                    onkeydown="/*globals CanvasJS */
ConversationPanel.inputKeyDown(event, this)">

                </label>

```

```

        </div>
    </div>
</div>
<!-- Bootstrap core JavaScript
===== -->
<script src="https://code.jquery.com/jquery-3.2.1.slim.min.js"
    integrity="sha384-
KJ3o2DKtIkVYIK3UENzmM7KCKRr/rE9/Qpg6aAZGJwFDMVNA/GpGFF93hXpG5KkN"
    crossorigin="anonymous"></script>
<script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.12.9/umd/popper.min.js"
    integrity="sha384-
ApNbgh9B+Y1QKtv3Rn7W3mgPxhU9K/ScQsAP7hUibX39j7fakFPskvXusvfa0b4Q"
    crossorigin="anonymous"></script>
<script src="https://maxcdn.bootstrapcdn.com/bootstrap/4.0.0/js/bootstrap.min.js"
    integrity="sha384-
JZR6Spejh4U02d8jOt6vLEHfe/JQGiRRSQQxSfFWpi1MquVdAyjUar5+76PVCmYI"
    crossorigin="anonymous"></script>

<script src="js/modal.js"></script>
<script src="js/api.js"></script>
<script src="js/common.js"></script>
<script src="js/conversation.js"></script>
<script src="js/global.js"></script>
</body>

</html>

```

GITHUB & PROJECT DEMO LINK :

https://drive.google.com/file/d/12fA2HxgSzTgcVGBOOnJTzA0Ynw_85_1C/view?usp=sharing