

PROJECT REPORT - 2022

AI BASED DISCOURSE FOR BANKING INDUSTRY

IBM Team ID:PNT2022TMID06863

TEAM MEMBERS:

- MANOJ K - GCTC1917130
- BHARATH C - GCTC1917108
- GOUTHAM K - GCTC1917116
- KIRAN KARTHIKEYAN GS - 1917127

**IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF
THE DEGREE OF**

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING



GOVERNMENT COLLEGE OF TECHNOLOGY

(An Autonomous institution affiliated to Anna University)

COIMBATORE-641 013

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1. INTRODUCTION

1.1 Project Overview

A cost effective solution that solves the banking queries of the customers and thereby helping them with their financial transactions and reducing the workload of the bank employees. To develop an efficient AI banking chatbot to effectively curb out the following constraints :

- ★ Answering basic banking queries regarding account creation, net banking, loan queries, etc..
- ★ Guiding a customer throughout the entire process of account creation also giving out effective and instant responses .
- ★ Understanding the Queries in a better way.
- ★ The chatbot can seamlessly escalate queries to customer agents while providing them with all the necessary data to ensure that these issues are resolved appropriately and without having to make the customers repeat any information.

The implementation of chatbot technology is evolving rapidly in the banking industry, yet customer acceptance is behind. The aim of the project is to build an efficient banking chatbot that answers the banking queries in a satisfactory manner.

1.2 Purpose

People might be finding issues with their banking accounts anytime a day,so they might be finding it difficult to approach banking personnels to resolve their issues immediately.Here the chatbot comes into scene wherein it provides 24*7 support for the banking customers to resolve their banking queries.These chatbots greatly reduce the workload of the banking personnels and hence makes the customers easy to resolve their queries and problems.

2. LITERATURE SURVEY

2.1 Existing problem

The AI-enabled banking chatbots available can answer a range of queries related to bank accounts, debit and credit cards, fund transfers etc.

Examples:

1. Erica, by Bank of America
2. Amex bot, by American Express
3. EVA, by HDFC Bank
4. Amy, by HSBC Bank(Hong Kong)
5. Ceba, by Commonwealth Bank Australia
6. Keya, by Kotak Mahindra Bank

2.2 References

- Lakshkaushik Dattatraya Puri, [A STUDY OF APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN BANKING AND FINANCE SECTOR](#), May 2022.
- Monika Anetta Alt, [Banking with a Chatbot – A Study on Technology Acceptance](#), April 2021.

2.3 Problem Statement Definition

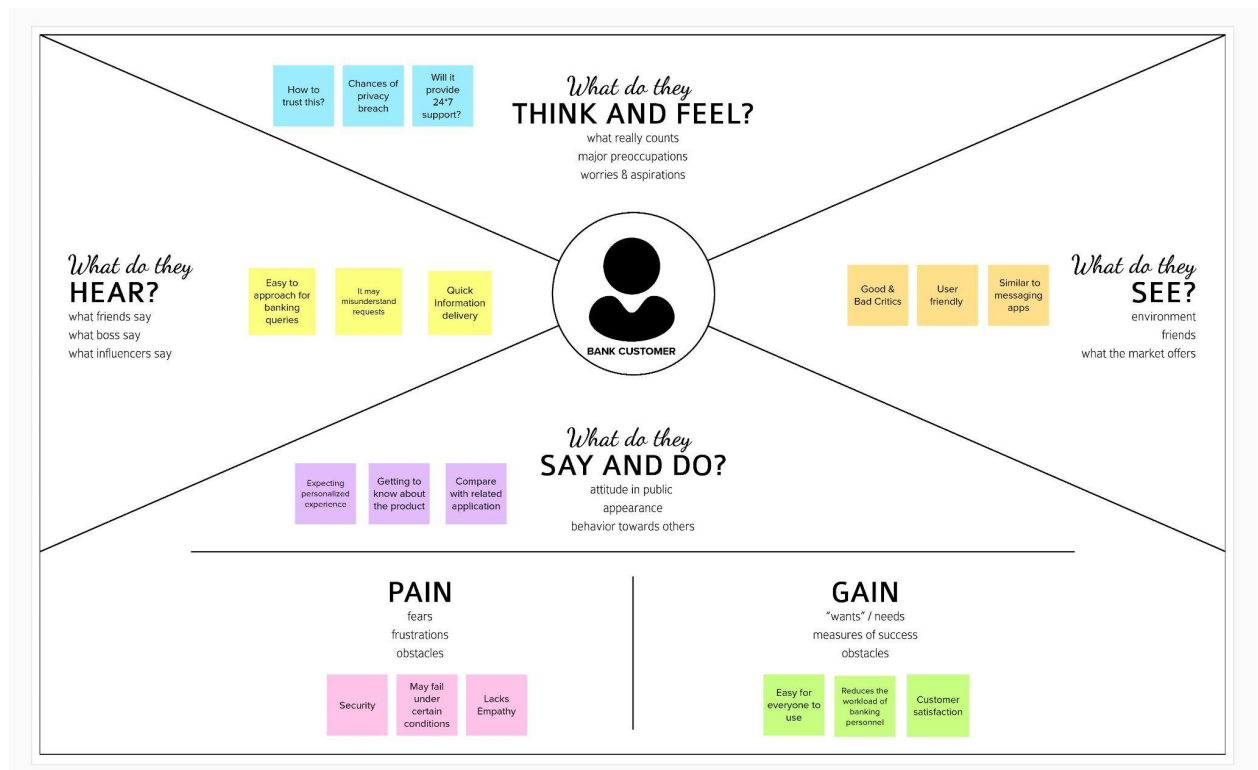
A cost effective solution that solves the banking queries of the customers and thereby helping them with their financial transactions and reducing the workload of the bank employees. To develop an efficient banking Chatbot using NLP and Deep learning to effectively curb out the following constraints :

- Answering basic banking queries regarding account creation, net banking, loan queries, etc..

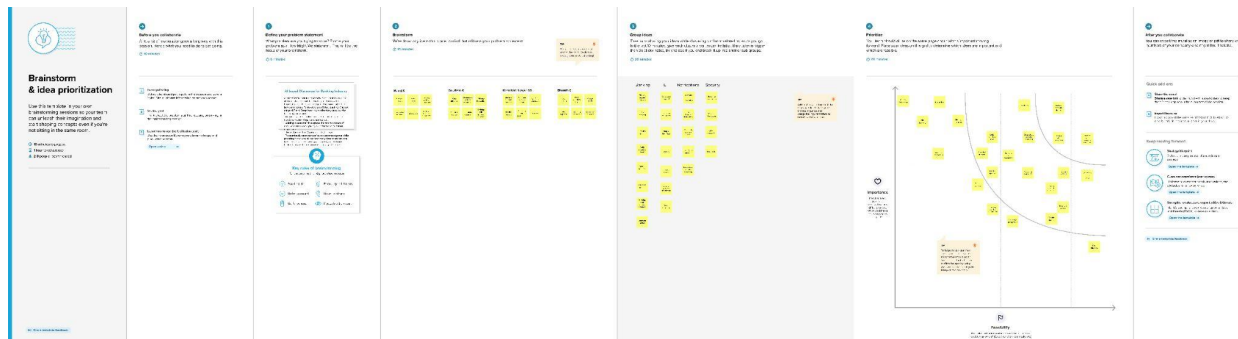
- Guiding a customer throughout the entire process of account creation also giving out effective and instant responses.
- Understanding the Queries in a better way.
- The chatbot can seamlessly escalate queries to customer agents while providing them with all the necessary data to ensure that these issues are resolved appropriately and without having to make the customer repeat any information.

3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas



3.2 Ideation & Brainstorming



3.3 Proposed Solution

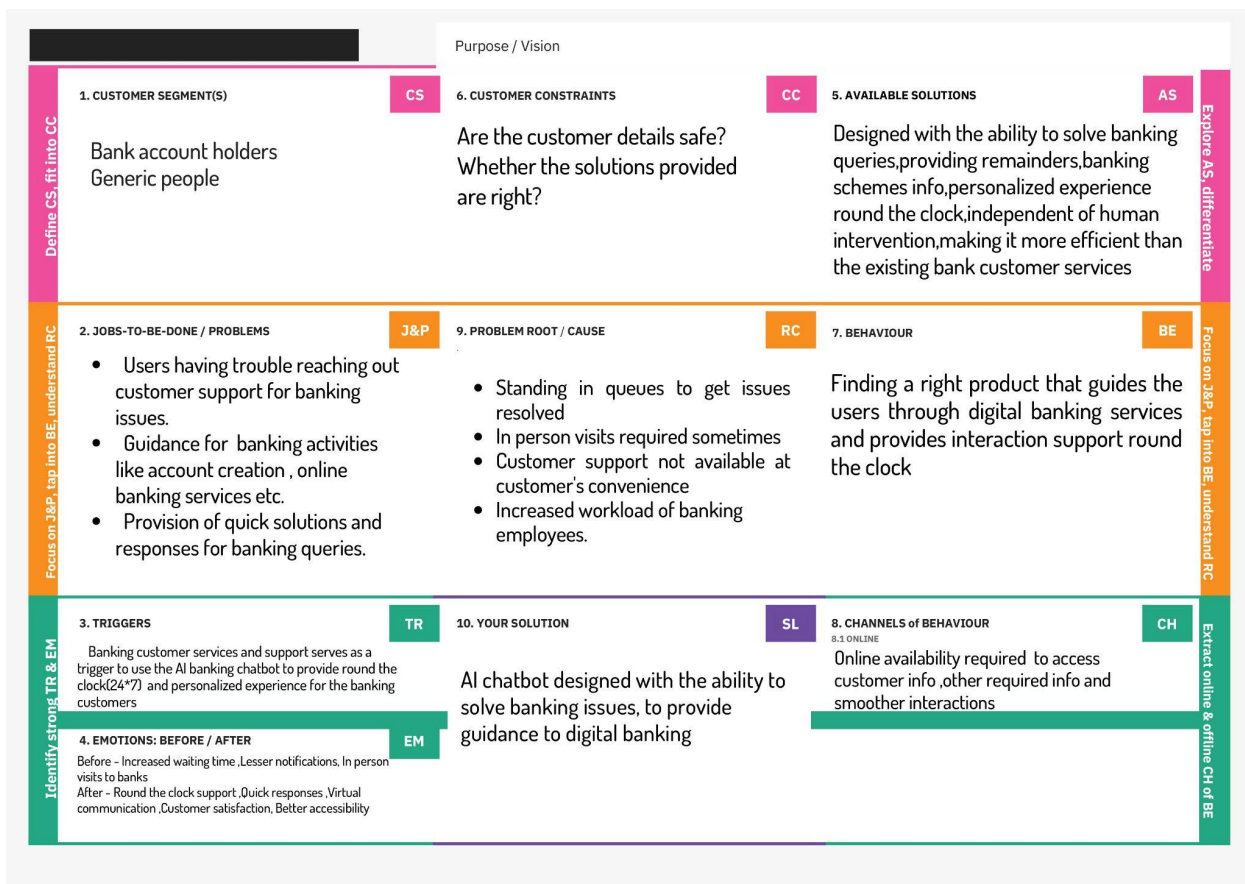
S.No	Parameter Description
1.	<p>Problem Statement (Problem to be solved)</p> <p>New users are finding it difficult to access the digital banking services.</p> <p>The challenge is to provide digital services that improve the customers experience by considering their personalised and specific needs</p>
2.	<p>Idea / Solution description</p> <p>AI based chatbot for Banking Industry using IBM Watson Assistant</p>
3.	<p>Novelty / Uniqueness</p> <p>Accurately recognizing the intention of the user from the queries and creating the response for the same</p>

4.	Social Impact / Customer Satisfaction	<ul style="list-style-type: none"> • Capable of engaging customers in a friendly manner • Works efficiently round the clock for customer service • Have extraordinary capabilities in handling customer queries • Reduces the workload of the bank employees
5.	Business Model (Revenue Model)	<ul style="list-style-type: none"> • This system can be integrated with any domain, solving the domain related queries from the users • Communicate and benefit better with conversational marketing

		<ul style="list-style-type: none"> • Chatbots can be a very efficient helper in back-office tasks as well
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6.	Scalability of the Solution	<ul style="list-style-type: none"> • Can be extended to manage multi-part queries • The chatbot will have more history and information pertaining to the customer, thereby enriching the interaction • Ability to provide better solution based on user feedback
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3.4 Problem Solution fit



4. REQUIREMENT ANALYSIS

4.1 Functional requirement

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Savings Account Related Actions	<ul style="list-style-type: none">➤ Type of Savings Account Creation Details➤ Interest Rate➤ Minimum Balance➤ Debit Card➤ Credit Card
FR-2	Current Account Related Actions	<ul style="list-style-type: none">➤ Type of Company➤ Current Account Closure Steps➤ Zero Balance Current Account
FR-3	Loan Account Related Actions	<ul style="list-style-type: none">➤ Types of Loan➤ Loan Status➤ Loan approval duration
FR-4	General Queries Related Actions	<ul style="list-style-type: none">➤ Bank Working Days➤ List of Branches➤ Finding a nearest branch➤ Currency Conversion Facility

FR-5	Net Banking Related Actions	<ul style="list-style-type: none"> ➤ Login Steps ➤ Change Net Banking Password ➤ Daily Limit ➤ Types of Fund Transfer ➤ Add Beneficiary
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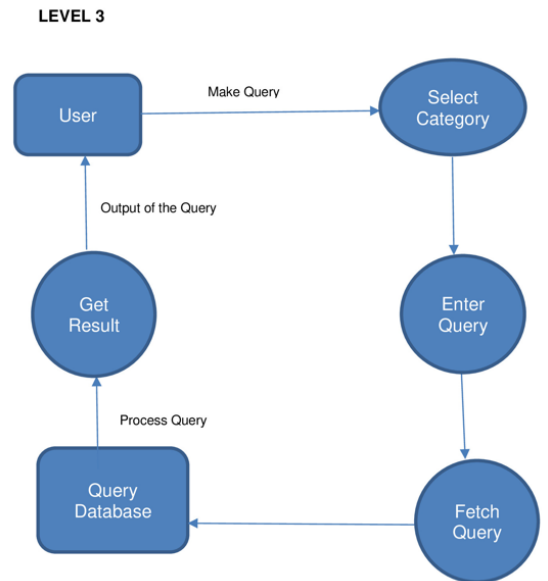
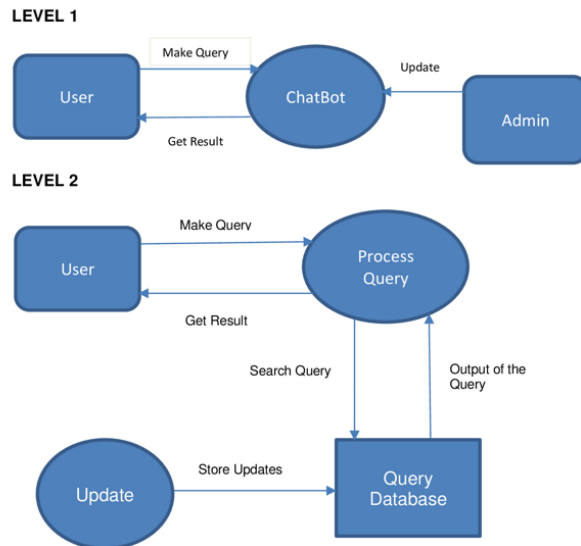
4.2 ***Non-Functional requirements***

	Non-Functional Requirement	Description
NFR-1	Usability	The AI banking chatbot addresses the queries of customers immediately and effectively in a cost efficient manner.
NFR-2	Security	The AI banking chatbot carries out a confidential conversation with customers ensuring a personal and efficient communication between the user and the bank.
NFR-3	Reliability	The Banking Chatbot is trained very well using AI to provide solutions for the popular and frequently asked questions, thereby providing the best suited service quickly thus ensuring a reliable end-user experience.

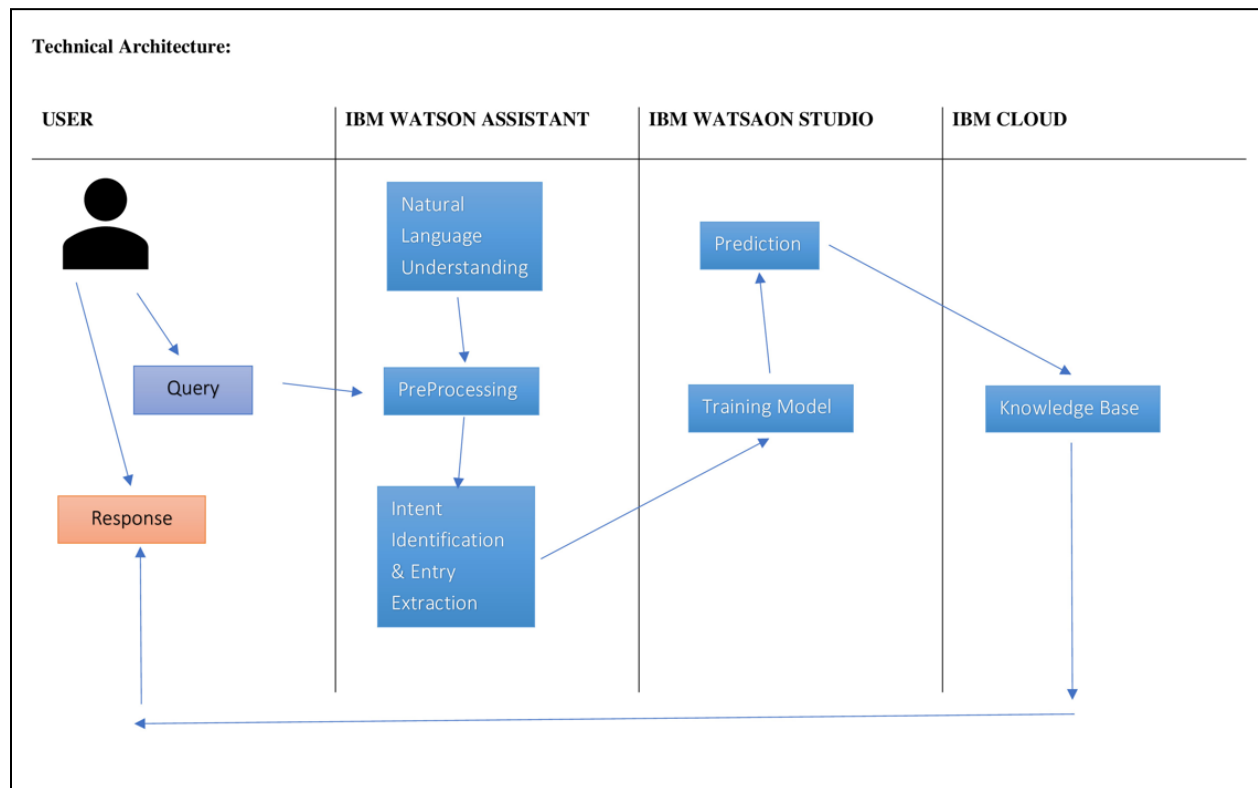
NFR-4	Performance	AI Chatbots greatly reduce the workload of humans. Such chatbots work in real time with no need for the customers to wait. This ensures faster, easier and more efficient face-time with customers.
NFR-5	Availability	Provides 24/7 service to clear all customer queries and guide them through all the banking processes. It is available to anyone with access to the internet with basic hardware.
NFR-6	Scalability	AI Chatbots are helping the banking industry to scale their customer service and to improve customer service satisfaction at the same time. It can be scaled as per the requirements of the bank to include answers to queries related to any new feature or service introduced by the bank.

5. PROJECT DESIGN

5.1 Data Flow Diagrams



5.2 Solution & Technical Architecture



Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Chatbot	HTML, CSS, JavaScript / React Js etc.
2.	Application Logic-1	Query processing	NLP and NLU

3.	Application Logic-2	Dealing with Dataset	IBM Watson STT service
4.	Application Logic-3	Training and Building Deep Learning Model	IBM Watson Studio
5.	Application Logic-4	Matching intent / Entities	IBM Watson Assistant ,IBM Watson Studio, Knowledge Base/Studio
6.	Application Logic-5	Deployment	Python Flask
7.	Database	Data Type –Dialog Query, Intent etc. Configurations done using small integration Code snippets such as Javascript , SQL and can also be done using Watson APIs.	MySQL or IBM DB2
8.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
9.	File Storage	For storing datasets	IBM Block Storage Service or Local Filesystem, IBM cloud, IBM Watson studio
10.	External API-1	To incorporate conversation, language and advanced text analytics into chatbot	IBM Watson Assistant API,v2 runtime API, etc.
11.	External API-2	Banking API –Data transfer between two systems and data accessibility.	Banking API, etc.
	Machine Learning Model	Intent detection model and other deep learning models	IBM Watson studio etc.
13.	Infrastructure (Server / Cloud)	On cloud server we will be deploying the chatbot using flask in the web page	Python Flask etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Open-source frameworks used is IBM Watson	Technology of Open Source framework IBM Watson
2.	Security Implementations	IBM Cloud	Watson assistant has certifications such as ISO,SOC2,US HIPAA, European Union GDPR,PCI DSS. We use security systems such as TCS/SSL,IPSEC ,Third party CAs, HTTPS, Encrypted file systems, Encrypted storage systems, Key management systems, AES -256 bit.
3.	Scalable Architecture	Chatbot architecture consists of four pillars. They are intents, entities ,data flow, scripts (3 – tier architecture –presentation tier, application tier, data tier and Microservices architecture)	Technology used –IBM Watson Assistant
4.	Availability	The Bot is made available using load balancers, distributed servers etc.	Technology used –IBM Watson Assistant
5.	Performance	IBM Watson –automate processes, The deep learning model is trained	Technology used –IBM Watson

		using IBM Watson studio for better performance, Cache, CDN's, etc.	
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5.3 *User Stories*

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile or Web user)	Savings Account Related Actions	USN-1	As a user, in the Savings Account option, I can select Types of Savings Account to get details regarding documents required for creating that savings account.	I can clear my queries regarding types of savings account	High	Sprint -1
		USN-2	As a user, I can check the Interest Rates of Savings Account	I can clear my queries regarding interest rates of savings account	High	Sprint -1
		USN-3	As a user, I can check the Minimum Balance of Savings Account	I can clear my queries regarding minimum balance of savings account	Medium	Sprint -2

	Current Account Related Actions	USN-4	As a user, I can choose the Type of Company to know the information on documents to be submitted for creating current account	I can clear my queries regarding types of companies	High	Sprint -1
		USN-5	As a user, I want to get details on procedure to close my Current Account	I can clear my queries regarding current account closure	High	Sprint -2
	Loan Account Related Actions	USN-6	As a user, I can choose the Type of Loans to know the information on choosing an essential loan scheme	I can clear my queries regarding types of loan account	High	Sprint -1
		USN-7	As a user, I can check the Status of Loan for my Loan Accounts	I can clear my queries regarding loan status of loan account	Low	Sprint -2
	General Queries Related Actions	USN-8	As a user, I want to get the procedure details for Currency Conversion facility of my bank account	I can clear my queries regarding currency conversion facilities of bank account	Low	Sprint -1
		USN-9	As a user, I want to check the list of branches near me and the availability that is the working days	I can clear my queries regarding the nearest branch available	Low	Sprint -2

	Net Banking Related Actions	USN-10	As a user, I want to get the procedure details for changing the Net Banking password of my bank account	I can clear my queries regarding change of net banking password	Medium	Sprint-2
		USN-11	As a user, I can select types of fund transfers to get details regarding different services available in net banking	I can clear my queries regarding types of fund transfers in net banking	High	Sprint-3
		USN-12	As a user, I want to get the procedure details for adding beneficiaries to my net banking account.	I can clear my queries regarding adding beneficiaries in net banking	Low	Sprint-3
Administrator		USN-13	As an admin, I can change responses to queries and modify them as and when needed.	I can modify responses of the chatbot	Medium	Sprint-1
		USN-14	As an admin, I can add more options to queries and add new options as new features get added.	I can add more options and queries into the chatbot	Medium	Sprint-1

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	Building of Assistant	USN-1	Creation of Banking Chatbot or Assistant using IBM Watson Assistant/ As a user, I can see a Banking Assistant.	12	High	Manoj K, Bharath C, Goutham k, Kiran Karthikeyan GS.
Sprint-1		USN-2	Understanding Customer's Banking Related Queries and skills/ As a user, I can see a Chatbot with Banking skills.	8	Moderate	Manoj K, Bharath C, Goutham k, Kiran Karthikeyan GS.
Sprint-2	Modelling of Assistant	USN-3	Building action and Adding responses to Account Creation/As a user, I can see a Chatbot which helps to create an account	5	High	Manoj K, Bharath C, Goutham k, Kiran Karthikeyan GS.
Sprint-2		USN-4	Building action and Adding responses to Banking related queries/As a user, I can see a Chatbot which helps to solve the banking queries.	5	High	Manoj K, Bharath C, Goutham k, Kiran Karthikeyan GS.
Sprint-2		USN-5	Building action and Adding responses to Net Banking/As a user, I can see a Chatbot which helps to access Net	5	High	Manoj K, Bharath C, Goutham k, Kiran

			Banking			Karthikeyan GS.
Sprint-2		USN-6	Building action and Adding responses to Loan Queries/As a user, I can see a Chatbot which helps in Loan related Queries.	5	High	Manoj K, Bharath C, Goutham k, Kiran Karthikeyan GS.
Sprint-3	Testing & Deployment Phase-I	USN-7	Testing the chatbot performance with the trained banking functionalities or conversations/As a user, I can know the chatbots performance level	10	High	Manoj K, Bharath C, Goutham k, Kiran Karthikeyan GS.

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-3		USN-8	Integration of Flask webpage with the chatbot assistant to provide a framework/As a user, I can see a webpage to access the chatbot.	10	High	Manoj K, Bharath C, Goutham k, Kiran Karthikeyan GS.
Sprint-4	Deployment Phase-II & Model Improvement	USN-9	Deployment of AI based chatbot for banking Industry or Running the Chatbot service/As a user, I can see and use a 24*7 banking chatbot.	15	High	Manoj K, Bharath C, Goutham k, Kiran Karthikeyan GS.
Sprint-4		USN-10	Improving the model efficiency whenever needed/As a user, I can	5	Mode rate	Manoj K, Bharath C, Goutham k,

			see new updated chatbot in Future days.			Kiran Karthikeyan GS.
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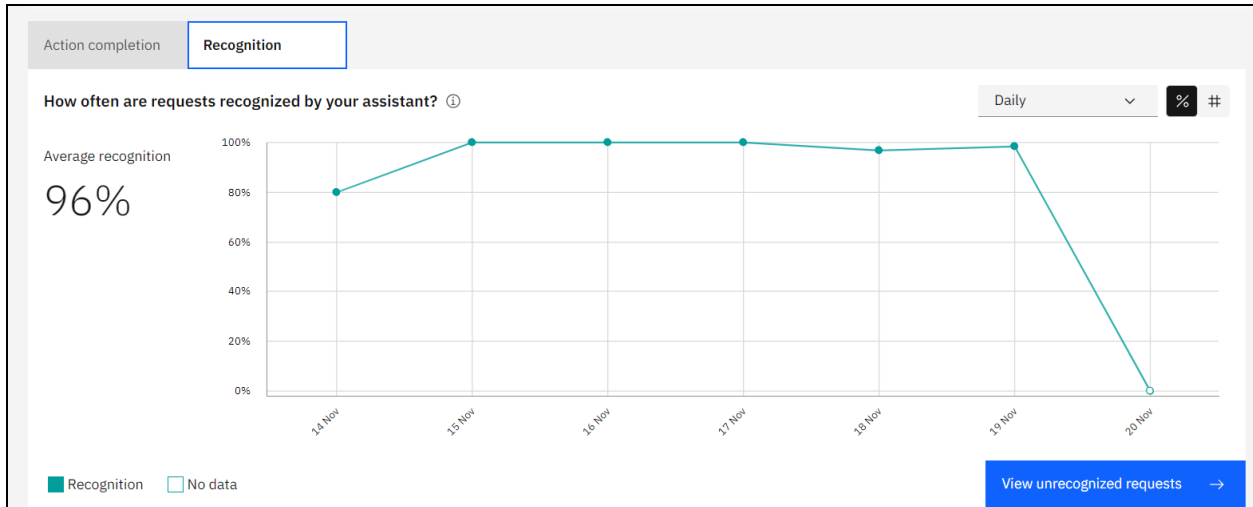
6.2 ***Sprint Delivery Schedule***

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	28 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	04 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	11 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	18 Nov 2022

7. ***CODING & SOLUTIONING*** (Explain the features added in the project along with code)

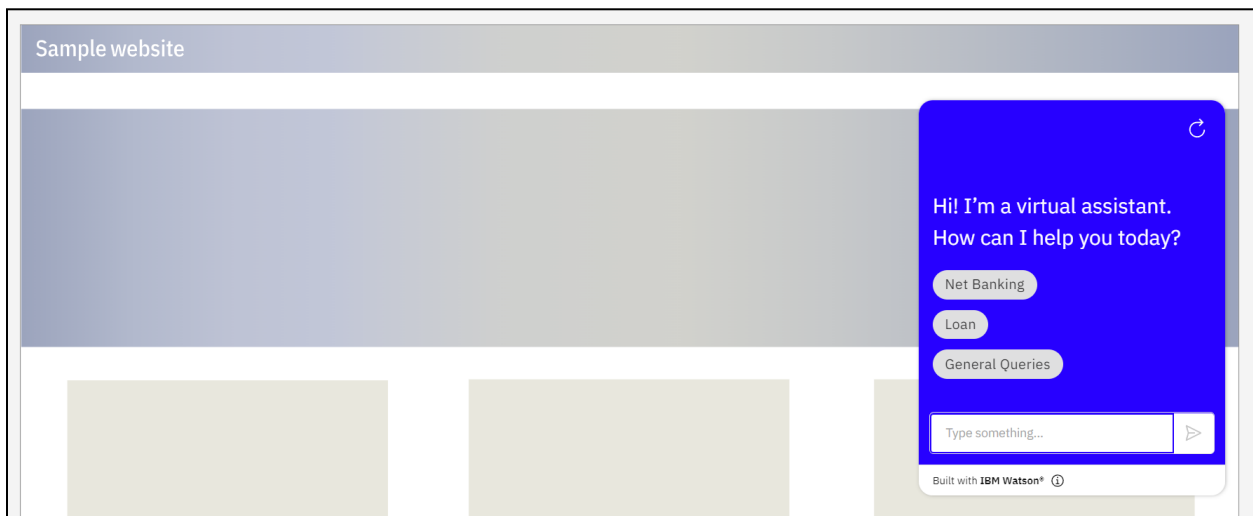
7.1 Feature 1

Easily Recognizable Agent with average recognition of 96%



7.2 Feature 2

Easily integratable with any websites and works 24x7



7.3 Database Schema (if Applicable)

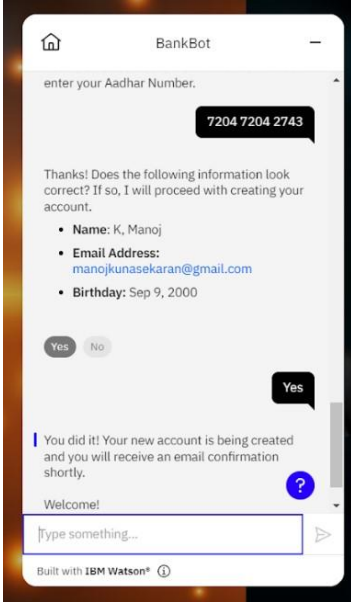
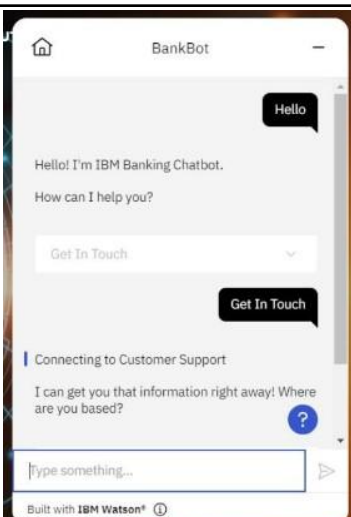
8. TESTING

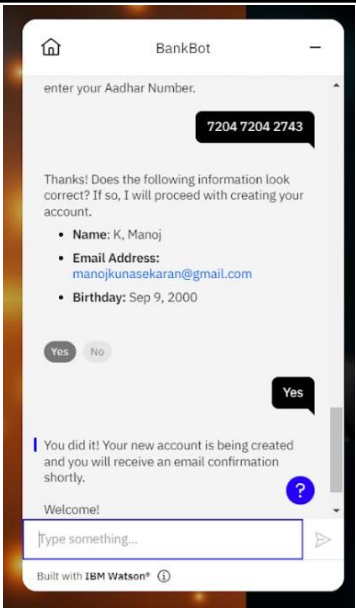
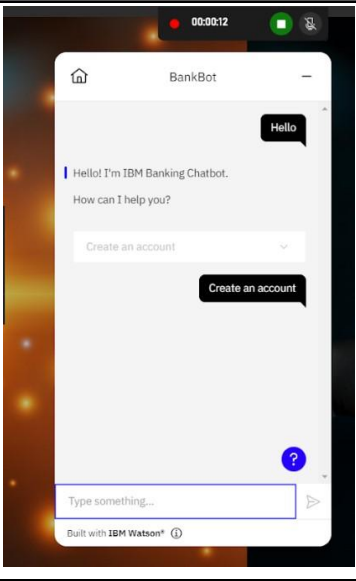
8.1 Test Cases

	Test Scenarios	
1	Verify user is able to see the chatbot icon when website is launched	
2	Verify the UI elements in chatbot icon popup	
3	Verify user is able to see the greeting from chatbot "Hi! I'm a Banking Bot. How can I help you today? Banking Enquiry Loan"	
4	Verify user is able to type query in text field.	
5	Verify user is able to get the response from chatbot	
6	Verify user whether get the response if the user enter the wrong query also	
	Search	
1	ChatBot icon should display.	
2	After 30 seconds Information about chatbot popup displayed	
3	User should see the greeting message from chatbot	
4	User able to type the query in text field.	
5	Users get the response from chatbot.	
6	Kindly reach out to our customer care executive. Contact Us @9999xxx999	

8.2 Performance Testing

S.No.	Parameters	Values	Screenshot
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1.	Performing the actions	The chatbot rightly performs the desired action for the user query	 <p>The screenshot shows a chat conversation with 'BankBot'. The bot asks for an Aadhar Number, which is provided as '7204 7204 2743'. The bot then asks for confirmation to create an account with the following details: Name: K, Manoj; Email Address: manojkunasekaran@gmail.com; Birthday: Sep 9, 2000. The user responds with 'Yes'. The bot confirms that the account is being created and that an email confirmation will be sent shortly. A 'Welcome!' message follows, and there is a text input field at the bottom.</p>
2.	Responses nature	The chatbot provides the right responses for the queries given by the user	 <p>The screenshot shows the initial chat interface with 'BankBot'. The bot greets the user with 'Hello' and 'Hello! I'm IBM Banking Chatbot. How can I help you?'. There is a 'Get In Touch' button. Below it, the bot says 'Connecting to Customer Support' and 'I can get you that information right away! Where are you based?'. There is a text input field at the bottom.</p>

			 A screenshot of a mobile app interface for 'BankBot'. The header shows a home icon, the name 'BankBot', and a minus sign. The main content area has a light gray background. At the top, it says 'enter your Aadhar Number.' followed by a black bubble containing the number '7204 7204 2743'. Below this, a message says 'Thanks! Does the following information look correct? If so, I will proceed with creating your account.' followed by a list: 'Name: K, Manoj', 'Email Address: manojkunasekaran@gmail.com', and 'Birthday: Sep 9, 2000'. There are 'Yes' and 'No' buttons. A 'Yes' bubble is shown. Below that, a message says 'You did it! Your new account is being created and you will receive an email confirmation shortly.' followed by 'Welcome!'. At the bottom is a text input field with 'Type something...' and a send button. A footer says 'Built with IBM Watson®'.
3.	Response time	The chatbot is able to quickly respond to the user's frequently used queries within a stipulated time	 A screenshot of a mobile app interface for 'BankBot'. The header shows a home icon, the name 'BankBot', and a minus sign. The main content area has a light gray background. At the top, it says 'Hello' in a black bubble. Below this, a message says 'Hello! I'm IBM Banking Chatbot. How can I help you?'. There is a dropdown menu with 'Create an account' selected. Below the dropdown is a black bubble with 'Create an account'. At the bottom is a text input field with 'Type something...' and a send button. A footer says 'Built with IBM Watson®'. A red status bar at the top shows '00:00:12'.

			 <p>The screenshot shows a mobile app interface for 'BankBot'. At the top, there's a status bar with the time 00:00:14. The app header shows a home icon, the name 'BankBot', and a close icon. The chat history includes a user message 'Hello' and a bot response 'Hello! I'm IBM Banking Chatbot. How can I help you?'. Below this is a dropdown menu with 'Create an account' selected. A button labeled 'Create an account' is visible. The bot's next response is 'Connecting to Account Creation...' followed by 'I can help you with that! To create an account, we will need a few pieces of information. Let me guide you through this process!'. At the bottom, there are 'Yes' and 'No' buttons, a text input field with a placeholder 'Type something...', and a blue question mark icon. The footer says 'Built with IBM Watson®'.</p>
4.	Intent recognition	The chatbot rightly recognizes the intent with which the user enquires it, rightly recognizing the requests by the user	 <p>The screenshot shows the same 'BankBot' app interface. The dropdown menu now shows 'Apply for Loan' selected. A button labeled 'Apply for Loan' is visible. The bot's response is 'Connecting to Loan Info...' followed by 'Great! what type of loan are you looking for?'. Below this is a dropdown menu with 'Select an option' selected. A button labeled 'Gold Loan' is visible. The bot's next response is 'Please approach the bank with the following documents :'. Below this is a list of documents: '1) Pan card', '2. Aadhar Card', and '3. Passport Size photo'. At the bottom, there are 'Yes' and 'No' buttons, a text input field with a placeholder 'Type something...', and a blue question mark icon. The footer says 'Built with IBM Watson®'.</p>

8.3 User Acceptance Testing

Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	0	0	2	1	3
Duplicate	0	0	0	0	0
External	0	0	0	0	0
Fixed	0	0	2	1	3
Not Reproduced	0	0	0	0	0
Skipped	0	0	0	0	0
Won't Fix	0	0	0	0	0
Totals	0	0	4	2	6

Test Case Analysis

This report shows the number of test cases that have passed, failed, and untested

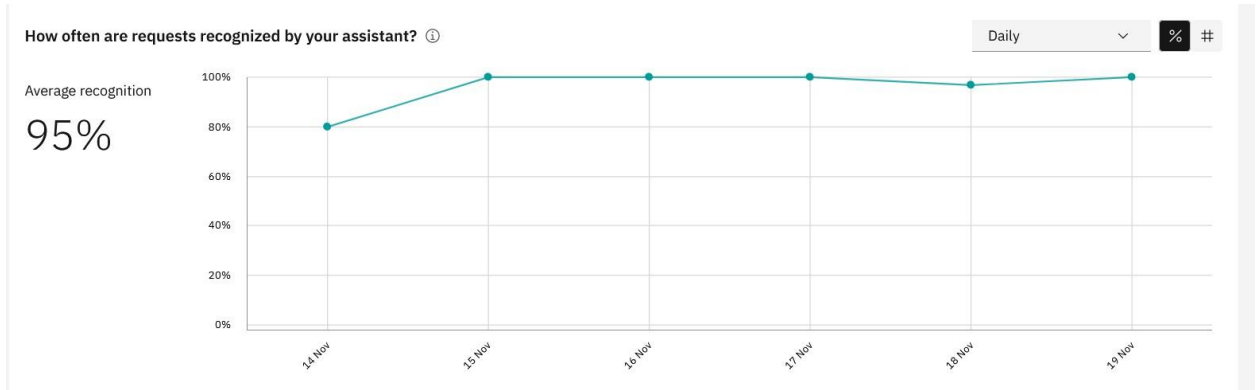
Section	Total Cases	Not Tested	Fail	Pass
Print Engine	0	0	0	0
Client Application	25	0	0	25
Security	0	0	0	0

Outsource Shipping	0	0	0	0
Exception Reporting	0	0	0	0
Final Report Output	25	0	0	25
Version Control	0	0	0	0

9. RESULTS

9.1 Performance Metrics

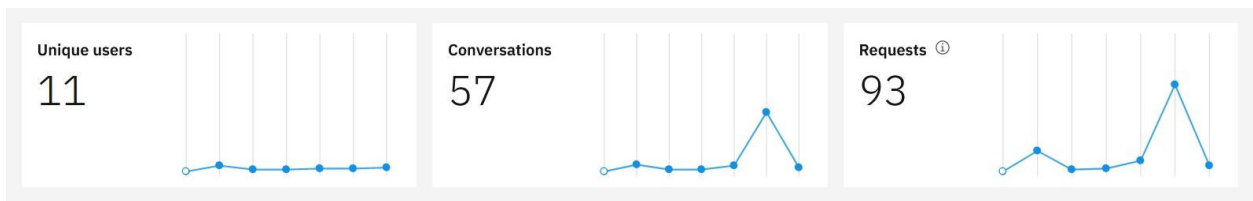
Request recognition and accuracy



Intent recognition and various actions completion

How was the action started?	Completion	Reason
Loan 18 November 11:34 PM	Complete	Assistant
Apply for Loan 18 November 10:14 PM	Complete	Assistant
Loan 18 November 12:03 PM	Complete	Assistant
Vehicle Loan 18 November 12:02 PM	Complete	Assistant
Loan 18 November 12:02 PM	Complete	Assistant
Loan 18 November 12:02 PM	Complete	Assistant
Loan 18 November 12:02 PM	Complete	Assistant
Apply for Loan	Complete	Assistant

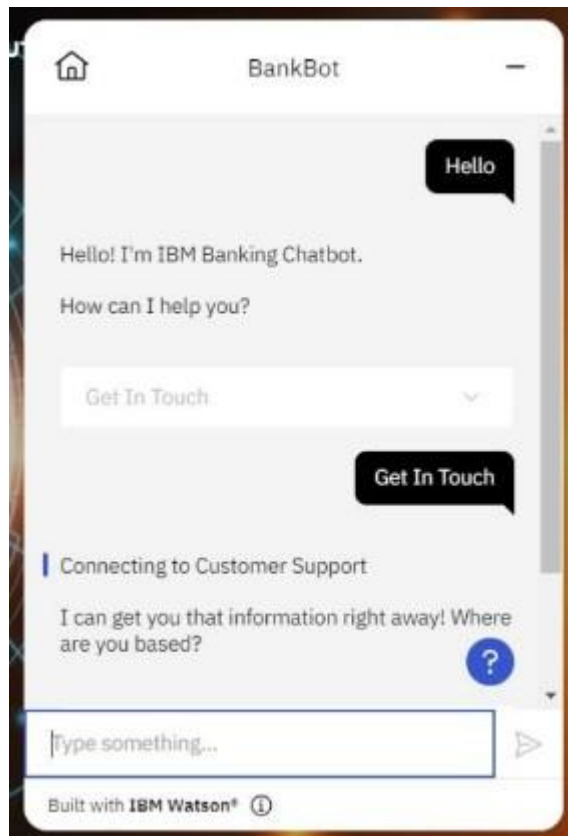
Users, conversations and requests



Goal Completion rate

How was the action started?	Completion	Reason
Net Banking 19 November 5:53 PM	Complete	Assistant
Net Banking 18 November 11:34 PM	Complete	Assistant
Net Banking 18 November 11:34 PM	Complete	Assistant
Net Banking 18 November 11:29 PM	Complete	Assistant
Net Banking 18 November 11:29 PM	Complete	Assistant
Net Banking 18 November 12:01 PM	Complete	Assistant
Net Banking 18 November 12:01 PM	Complete	Assistant
Net Banking 18 November 12:01 PM	Complete	Assistant

Conversation starter messages



10. ADVANTAGES & DISADVANTAGES

10.1 Advantages

24*7 availability

Immediate responses for user queries

Guiding the users into digital banking platform

Guiding the users into account creation,digital banking services

Reduced workload of banking personnels

Banking users need not wait in long queues to get their banking issues resolved

Banking users can get their desired queries resolved at their convenience

10.2 Disadvantages

Customer information needs to be secured, security concerns always exist

The queries and knowledge base needs to be predefined beforehand

Constant updation of information and security facilities for better customer experience

Certain issues can be resolved only through in person visit to banks

11. CONCLUSION

Robust and rapid processing needs, advent of mobile technology, data availability, and proliferation of open-source software offer AI a huge scope in the banking sector.

Though AI has been used in banking for decades, it remained unnoticed. In today's app-driven world, the banking sector eyes on leveraging with the help of mobile app development companies.

In all these ways, AI in banking is continuing to transform the industry to provide a greater level of value to their customers, reduce risks, and increase opportunities as the financial engines of our modern economy.

12. FUTURE SCOPE

Chatbots are Now Based on Natural Language Processing(NLP)

The goal is to allow users and Artificial Intelligence to communicate naturally and understand complex requests. This would mean that customer service agents would be able to focus on other tasks while the AI takes care of customers' queries. Chatbots in finance, in the digital banking and healthcare industries might save more than 12 billion USD in a year by 2022. According to several estimates, financial organizations might save 2 trillion USD by 2030 by implementing artificial intelligence and cutting costs by 35%. In the digital banking business, banks with Chatbots can automate a variety of functions in addition to enhancing everyday operations and the universal consumer experience as fund transfer, Notifications & Alerts at the Right Time, Get help from a Customer Service Representative, simple lead generation.

13. APPENDIX

Source Code:

1. app.py

```
from flask import Flask, render_template
app = Flask(__name__, template_folder='templateFiles', static_folder='staticFiles')

@app.route('/')
def home():
    return render_template('index.html')

if __name__ == '__main__':
    app.run(debug=True, use_reloader=True)
```

2. *templateFiles/index.html*

```
<!DOCTYPE html>
<html lang="en">
<head>
  <title>AI BASED DISCOURSE FOR BANKING INDUSTRY</title>
  <link rel="stylesheet" href="/staticFiles/style.css">
</head>
<body>

  <div class="main">
    <div class="navbar">
      <div class="icon">
        <h2 class="logo">BankBot</h2>
      </div>

      <div class="menu">
        <ul>
          <li><a href="#">HOME</a></li>

          <li><a href="#">SERVICE</a></li>
          <li><a href="#">CONTACT</a></li>
          <li><a href="#">ABOUT</a></li>
        </ul>
      </div>
    </div>
    <div class="content">
      <h1>AI Based Discourse for <br><span>Banking</span> <br>Industry</h1>
<br>
      <button class="cn" ><a href="#">JOIN US</a></button>
    </div>
  </div>
  <script>
    window.watsonAssistantChatOptions = {
      integrationID: "4e0fe44a-1104-49c2-9841-13c40c68fc3d", // The ID of this integration.
      region: "au-syd", // The region your integration is hosted in.
      serviceInstanceID: "d2539c5d-c646-4c9a-a3c6-108234f7859a", // 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>  
</body>  
</html>
```

3. ***staticFiles/hand-chatbot-technology-background.jpg***



4. ***staticFiles/style.css***

```
*{  
    margin: 0;  
    padding: 0;  
}
```

```
.main{
  width: 100%;
  background: linear-gradient(to top, rgba(0,0,0,0.5)50%,rgba(0,0,0,0.5)50%),
url(hand-chatbot-technology-background.jpg);
  background-position: center;
  background-size: contain;
  height: 100vh;
  filter: brightness(1.5);
}

.navbar{
  width: 1200px;
  height: 75px;
  margin: auto;
}

.icon{
  width: 200px;
  float: left;
  height: 70px;
}

.logo{
  color: #fff;
  font-size: 35px;
  font-family: Arial;
  padding-left: 20px;
  float: left;
  padding-top: 10px;
  margin-top: 5px
}

.menu{
  width: 400px;
  float: left;
  height: 70px;
}

ul{
  float: left;
  display: flex;
  justify-content: center;
  align-items: center;
}
```

```
ul li{
    list-style: none;
    margin-left: 62px;
    margin-top: 27px;
    font-size: 14px;
}
```

```
ul li a{
    text-decoration: none;
    color: #fff;
    font-family: Arial;
    font-weight: bold;
    transition: 0.4s ease-in-out;
}
```

```
ul li a:hover{
    color: #3857cf;
}
```

```
.search{
    width: 330px;
    float: left;
    margin-left: 270px;
}
```

```
.srch{
    font-family: 'Times New Roman';
    width: 200px;
    height: 40px;
    background: transparent;
    border: 1px solid #ff7200;
    margin-top: 13px;
    color: #fff;
    border-right: none;
    font-size: 16px;
    float: left;
    padding: 10px;
    border-bottom-left-radius: 5px;
    border-top-left-radius: 5px;
}
```

```
.btn{
    width: 100px;
```

```

height: 40px;
background: #ff7200;
border: 2px solid #ff7200;
margin-top: 13px;
color: #fff;
font-size: 15px;
border-bottom-right-radius: 5px;
border-bottom-right-radius: 5px;
transition: 0.2s ease;
cursor: pointer;
}
.btn:hover{
    color: #000;
}

.btn:focus{
    outline: none;
}

.srch:focus{
    outline: none;
}

.content{
    width: 1200px;
    height: auto;
    margin: auto;
    color: white;
    position: relative;
}

.content .par{
    padding-left: 20px;
    padding-bottom: 25px;
    font-family: Arial;
    letter-spacing: 1.2px;
    line-height: 30px;
}

.content h1{
    font-family: 'Times New Roman';
    font-size: 50px;
    padding-left: 20px;
    margin-top: 9%;

```

```
letter-spacing: 2px;  
}
```

```
.content .cn{  
  width: 160px;  
  height: 40px;  
  background:#3857cf;  
  color: white;  
  border: none;  
  margin-bottom: 10px;  
  margin-left: 20px;  
  font-size: 18px;  
  border-radius: 10px;  
  cursor: pointer;  
  transition: .4s ease;  
  
}
```

```
.content .cn a{  
  text-decoration: none;  
  color: #000;  
  transition: .3s ease;  
}
```

```
.cn:hover{  
  background-color: #fff;  
}
```

```
.content span{  
  color: #3857cf;  
  font-size: 65px  
}
```

```
.form{  
  width: 250px;  
  height: 380px;  
  background: linear-gradient(to top, rgba(0,0,0,0.8)50%,rgba(0,0,0,0.8)50%);  
  position: absolute;  
  top: -20px;  
  left: 870px;  
  transform: translate(0%,-5%);  
  border-radius: 10px;  
  padding: 25px;  
}
```

```
.form h2{  
  width: 220px;  
  font-family: sans-serif;  
  text-align: center;  
  color: #ff7200;  
  font-size: 22px;  
  background-color: #fff;  
  border-radius: 10px;  
  margin: 2px;  
  padding: 8px;  
}
```

```
.form input{  
  width: 240px;  
  height: 35px;  
  background: transparent;  
  border-bottom: 1px solid #ff7200;  
  border-top: none;  
  border-right: none;  
  border-left: none;  
  color: #fff;  
  font-size: 15px;  
  letter-spacing: 1px;  
  margin-top: 30px;  
  font-family: sans-serif;  
}
```

```
.form input:focus{  
  outline: none;  
}
```

```
::placeholder{  
  color: #fff;  
  font-family: Arial;  
}
```

```
.btnn{  
  width: 240px;  
  height: 40px;  
  background: #ff7200;  
  border: none;  
  margin-top: 30px;  
  font-size: 18px;
```



```
border-radius: 10px;
cursor: pointer;
color: #fff;
transition: 0.4s ease;
}
.btnn:hover{
background: #fff;
color: #ff7200;
}
.btnn a{
text-decoration: none;
color: #000;
font-weight: bold;
}
.form .link{
font-family: Arial, Helvetica, sans-serif;
font-size: 17px;
padding-top: 20px;
text-align: center;
}
.form .link a{
text-decoration: none;
color: #ff7200;
}
.liw{
padding-top: 15px;
padding-bottom: 10px;
text-align: center;
}
.icons a{
text-decoration: none;
color: #fff;
}
.icons ion-icon{
color: #fff;
font-size: 30px;
padding-left: 14px;
padding-top: 5px;
transition: 0.3s ease;
}
.icons ion-icon:hover{
color: #ff7200;
}
```

GitHub Repository Link: <https://github.com/IBM-EPBL/IBM-Project-3863-1658667538>

Project Demo Link:

[PNT2022TMID06863 - AI BASED DISCOURSE FOR BANKING INDUSTRY.mp4](#)

Demo Website Link: <https://ai-based-banking-chatbot.herokuapp.com/>

Purpose:

People might be finding issues with their banking accounts anytime a day,so they might be finding it difficult to approach banking personnels to resolve their issues immediately.Here the chatbot comes into scene wherein it provides 24*7 support for the banking customers to resolve their banking queries.These chatbots greatly reduce the workload of the banking personnels and hence makes the customers easy to resolve their queries and problems