

PROJECT REPORT

AI BASED DISCOURSE FOR BANKING INDUSTRY

Team ID: PNT2022TMID15528

TEAM LEADER:

Name: MANDAVA MAHESH CHOWDARY

Register Number: 111519205027

TEAM MEMBERS:

Name: G BHANU PRAKASH

Register Number: 11519205009

Name: K VENKAT SAI NEERAJ

Register Number: 111519205018

Name: H PADMAKAR VARMA

Register Number: 111519205012

CONTENTS

1. INTRODUCTION

- 1.1 Project Overview
- 1.2 Purpose

2. LITERATURE SURVEY

- 2.1 Existing problem
- 2.2 References
- 2.3 Problem Statement Definition

3. IDEATION & PROPOSED SOLUTION

- 3.1 Empathy Map Canvas
- 3.2 Ideation & Brainstorming
- 3.3 Proposed Solution
- 3.4 Problem Solution fit

4. REQUIREMENT ANALYSIS

- 4.1 Functional requirement
- 4.2 Non-Functional requirements

5. PROJECT DESIGN

- 5.1 Data Flow Diagrams
- 5.2 Solution & Technical Architecture
- 5.3 User Stories

6. PROJECT PLANNING & SCHEDULING

- 6.1 Sprint Planning & Estimation
- 6.2 Sprint Delivery Schedule
- 6.3 Reports from JIRA

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

- 7.1 Feature 1
- 7.2 Feature 2
- 7.3 Database Schema (if Applicable)

8. TESTING

- 8.1 Test Cases
- 8.2 User Acceptance Testing

9. RESULTS

- 9.1 Performance Metrics

10. ADVANTAGES & DISADVANTAGES

11. CONCLUSION

12. FUTURE SCOPE

13. APPENDIX

Source Code

GitHub & Project Demo Link

1. INTRODUCTION

1.1 Project Overview

This project, titled “AI Based Discourse for Banking Industry”, aims at providing a platform for customers to clarify their queries online regarding banking. This is achieved with the help of a chatbot that is trained with some of the most frequently asked questions that banking customers usually tend to come up with. The chatbot is created using IBM Watson Assistant and is trained by manually adding the queries to it along with the relevant responses. The chatbot will then be available for use on a website which usually is the bank’s website for anyone to access. Customers or anyone in fact can access the chatbot to interact with it and find solutions to their queries.

1.2 Purpose

With banking being an essential service that people require and with it being a slightly complicated and confusing topic for many, a lot of queries naturally tend to arise. For them to be answered as they are predominantly now in a manual aspect either by face to face interactions with a banking employee or through a customer care service, will require a lot of workforce and still end up with long waiting times. Hence, comes the need for an automated solution to the problem which can be easily handled by our chatbot. A chatbot is free, easy to use and is readily accessible at all times and from anywhere. It also provides instant reliable answers to queries and hence eliminating the need for the customers to wait to get their queries cleared. It also ensures that there is no spread of misinformation by providing official and authentic responses to queries straight from the bank sources.

2. LITERATURE SURVEY

2.1 Existing problem

Banks are not able to resolve the queries of customers at all times related to the products or services in a satisfactory way which in turn hinders the customer satisfaction. Customers need to visit banks frequently for simple queries.

2.2 References

Paper 1

Authors: Vinod Kumar Shukla, Sasha Fathima Suhel, Sonali Vyas, Ved Prakash Mishra

Year: 2020

Title: Conversation to Automation in Banking Through Chatbot Using Artificial Machine Intelligence Language

Methodology: This paper examines some of the latest AI patterns and activities. System-Chatbots are made. In the banking industry, the introduction of Artificial Intelligence has driven chatbots and changed the face of the interaction between banks and customers.

Advantage: Artificial Intelligence involves creating machines that are capable of simulating knowledge. It also explores the existing usability of chatbot to assess whether it can fulfill the customers ever-changing needs.

Disadvantage: The dialogue capability can be limited to a very specific set or format of questions that are established by the chatbot development team.

Paper 2

Authors: Yomna Abdulla, Rabab Ebrahim, Sumathi Kumaraswamy Year:

2020

Title: Artificial Intelligence in Banking sector: Evidence from Bahrain

Methodology: Artificial intelligence applications and robotic process automation for chatbots are discussed. Findings highlight that a high priority is given to the digital transformation journey in banks, which suggests that further development and implantation of technology in banks will be seen in the near future.

Advantage: AI can be best described as the computerized processes that employ knowledge, reasoning, and communication that aids smart decision making by chatbots in banks.

Disadvantage: Banking sector faces significant challenges relating to security, risk management and inefficiency that decrease the overall performance of banks.

Paper 3

Authors: Tebaga Lucky Mamela, Nita Sukdeo, Sambil Charles Mukwakungu

Year: 2020

Title: Adapting to Artificial Intelligence through Workforce Re-skilling within the Banking Sector in South Africa

Methodology: This research paper intends to inspire the banking sector to re-skill the banking Institution's workforces in South Africa to adapt to the Artificial Intelligence technologies.

Advantage: Re-skilling the banking workforce to cooperate and collaborate effectively with Artificial Intelligence will enable not only efficiency but futuristic innovation and continuous growth.

Disadvantage: Although AI is creating millions of new jobs, the banking institutions does the substitution of workforces with intelligent robots that could increase the inequality among the highly skilled workforce.

Paper 4

Authors: Shashank Bairy, Rashmi R

Year: 2021

Title: Conversation to Automation in Banking Through Chatbot Using Artificial Machine Intelligence Language

Methodology: Chatbot is a software application that listens to a user's query in natural language and responds accordingly. There is rapid adoption of the latest technologies in banking and chatbots are one of them. Answering customer queries and assisting customers with banking transactions are some of the ways in which it's making an impact on the industry.

Advantage: Netbanking websites are complex and involve navigating through a lot of pages to find the information that users need. Bank staff undergo a lot of stressful situations when communicating with clients directly. Such situations can be avoided gracefully by using chatbots with AI.

Disadvantage: Chatbots cannot hold the conversation which means it cannot answer multiple questions at the same time.

Paper 5

Authors: Navleen Kaur, Dr Monika Sharma, Supriya Lamba Sahdev, Laraibe Siddiqui

Year: 2020

Title: A Review of Chatbots in the Banking Sector

Methodology: Artificial intelligence (AI), is simulation of human intelligence in machines. Artificial intelligence consists of generally two fundamental ideas. First it involves studying human brains like how their thought process works and secondly it helps representing those processes through machine learning.

Advantage: AI is used in banking industry to minimize the chances of fraud and scam. It is also used to carry out effective decision-making

Disadvantage: 24.1% i.e. 27 people out of 112 are not sure that using artificial intelligence in banking is beneficial. 4.5% i.e. 5 people out of 112 don't think that it is beneficial at all. 22.3% i.e. 25 people don't agree that it has any impact on fast services.

Paper 6

Authors: Dr. Anil B Malali, Dr. S. Gopalakrishnan

Year: 2020

Title: Application of Artificial Intelligence and Its Powered Technologies in the Indian Banking and Financial Industry

Methodology: Examine the dynamics of AI ecosystems in the banking and financial industry and how it is fast becoming a most important disrupter by looking at some of the critical unsolved problems in this area of business

Advantage: AI will empower banking organizations to completely redefine how they operate, establish innovative products and services, and most importantly impact customer experience interventions.

Disadvantage: AI and ML are replacing the human analysts in business activities since human selection involves high cost.

Paper 7

Authors: Dr. Shalini Sayiwal

Year : 2020

Title: CHATBOTS IN BANKING INDUSTRY: A CASE STUDY

Methodology: Chatbots designed with AI are one of the most promising strategies of a banking business that can lead the bank to win the satisfaction vote of their loyal customers.

Advantage: Chatbots are relatively inexpensive to develop and maintain compared to the human equivalent. Chatbots are more intuitive and easier to use. There is no download required and the experience can be personalized over time through machine learning.

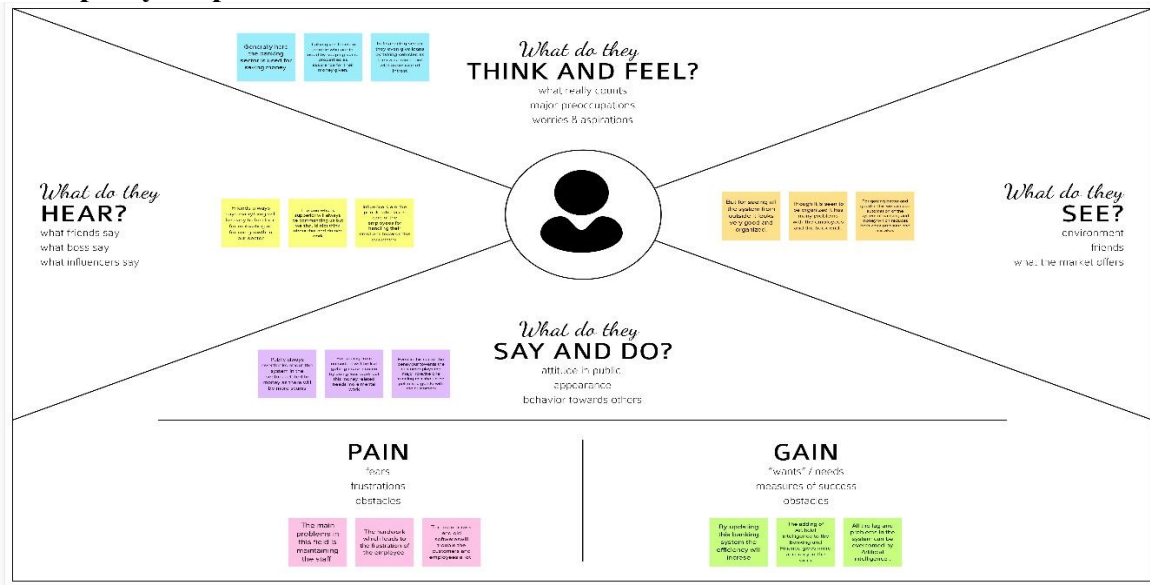
Disadvantage: Chatbots have significant limitations based on accents and languages.

2.3 Problem Statement Definition

Banking is one the crucial sectors, it deals with financial transactions which can be availed by everyone, but banks are not able to resolve the queries of customers at all times related to the products or services in a satisfactory way in turn hinders the customer satisfaction. In order to guide the customers throughout all the financial services provided by the bank, an intelligent system has to be introduced to provide people with the best solution possible. The users are bank customers who need 24/7 service to clear all their queries and guide them through all the banking processes. So, an enhanced and smarter way of interaction with the customers has to be built to ensure efficient delivery of service. In order to overcome the user satisfaction issues associated with banking services, chatbot will provide personal and efficient communication between the user and the bank. It is built to be the overall virtual assistant that can facilitate customers to ask banking- related questions without visiting the bank or calling up customer service centers as well as providing them with relevant suggestions.


3. IDEATION AND PROPOSED SOLUTION

3.1 Empathy Map Canvas




3.2 Ideation & Brainstorming


Template




Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

 **10 minutes** to prepare

 **1 hour** to collaborate

 **2-8 people** recommended

1

Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

🕒 5 minutes

PROBLEM

- How might the bank provide facilities to find frauds?
- How might the customer can access to the bank?
- How might the bank provides security to their customers?
- How might the bank be helpful to predicting the loans?



Key rules of brainstorming

To run an smooth and productive session

- Stay in topic.
- Encourage wild ideas.
- Defer judgment.
- Listen to others.
- Go for volume.
- If possible, be visual.

2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

🕒 10 minutes

TIP



You can select a sticky note and hit the pencil [switch to sketch] icon to start drawing!

Mandava Mahesh

- Proper security system should be maintained
- Network access for every customer should be good
- Back-end should be accurate
- Fraud detection

Bhanu Prakash

- Access should be controlled
- Authentication should be perfect
- Login credentials should be matched
- Loan amount should be verified

Venkata Sai Neeraj

- Account should be verified
- Recover process should be fast
- Fake accounts should be detected
- OTP system would be better

Padmakara Varma

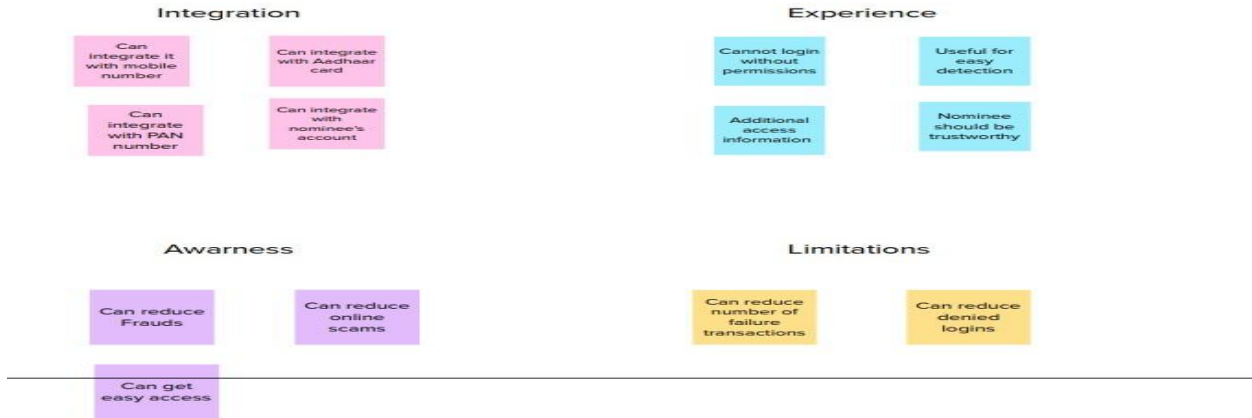
- Detect fraud customers
- ChatBot system should be implemented
- Loan amount should be based on their previous records
- Customer needs to satisfy

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, 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.

⌚ 20 minutes

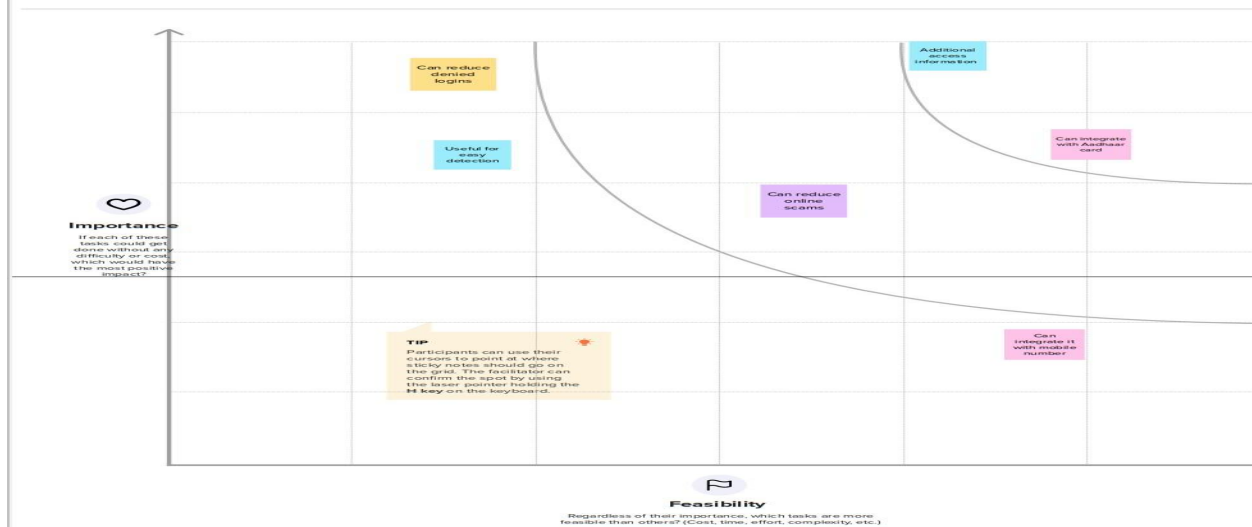


4

Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

⌚ 20 minutes



3.3 Proposed Solution

S.NO	PARAMETER	DESCRIPTION
1.	Problem Statement (Problem to be solved)	Banks are not able to resolve the queries of customers at all times related to the products or services in a satisfactory way which in turn hinders the customer satisfaction. Customers need to visit banks frequently for simple queries.
2.	Idea / Solution description	In order to guide the customers throughout all the financial services provided by the bank, an intelligent system has to be introduced to provide people with the best solution possible.
3.	Novelty / Uniqueness	Chatbots developed using AI should be able to answer any general banking queries on account creation, loan, net banking, other services etc. It addresses the queries of customers immediately and effectively in a cost efficient manner.
4.	Social Impact / Customer Satisfaction	In order to attain the user satisfaction issues associated with banking services, chatbot will provide personal and efficient communication between the user and the bank. It is built to be the overall virtual assistant that can facilitate customers to ask banking- related questions without visiting the bank or calling up customer service centers as well as providing them with relevant suggestions.
5.	Business Model (Revenue Model)	Employing a chatbot will be a cost-effective solution to clear customer queries for banks. It eliminates the need for a massive customer care workforce and even reduces the workload of the bank employees whose efforts can be used elsewhere.
6.	Scalability of the Solution	AI Chatbots provides 24/7 service to clear all customer queries and guide them through all the banking processes. It supports voice assistance feature and maintains a confidential conversation with customers. 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.

3.4 Problem Solution fit

Project Design Phase-I

Team ID: PNT2022TMID15528

PROBLEM SOLUTION FIT

Problem-Solution Fit canvas

Define CS, fit into CL	1. CUSTOMER SEGMENT(S) CS Who is your customer? eg. working parents of 0-5 yrs. kids <div>The bank customers who have questions.</div>	6. CUSTOMER LIMITATIONS EG. BUDGET, DEVICES CL What limits your customers to act when problem occurs? Spending power, budget, no cash in the pocket? Network connection? Available devices? <div>Customer must have a smart phone or laptop with internet connectivity</div>	5. AVAILABLE SOLUTIONS PLUSES & MINUSES AS Which solutions are available to the customer when he/she is facing the problem? What has he/she tried in the past? Pluses & minuses? <div>Customers queries not understood by the bank so, we need to feed more number of queries to the bot</div>	Explore AS, differentiate
	2. PROBLEMS / PAINS + ITS FREQUENCY PR Which problem do you solve for your customer? There could be more than one, explore different sides. eg. existing solar solutions for private houses are not considered a good investment (1). How often does this problem occur? <div> 1. queries about account creation 2. queries about loan 3. general query </div>	9. PROBLEM ROOT / CAUSE RC What is the root of every problem from the list? eg. People think that solar panels are bad investment right now, because they are too expensive (1.1), and possible changes to the law might influence the return of investment significantly and diminish the benefits (1.2). <div> 1. customers go to the bank to solve his problem 2. Time restrictions of bank opening hours </div>	7. BEHAVIOR + ITS INTENSITY BE What does your customer do about / around / directly or indirectly related to the problem? eg. directly related: tries different "green energy" calculators in search for the best deal (1.1), usually chooses for 100% green provider (1.2). Indirectly related: volunteering work (Greenpeace etc) How often does this related behavior happen? <div> 1. Customers have to physically visit the bank to rectify own problem. 2. Easy to access. </div>	Focus on PR, tap into BE, understand RC
Identify strong TR & EM	3. TRIGGERS TO ACT TR What triggers customer to act? eg. seeing their neighbor installing solar panels (1.1), reading about innovative, more beautiful and efficient solution (1.2) <div>Bot Should be able to answer the all the common queries.</div>	10. YOUR SOLUTION SL If you are working on existing business - write down existing solution first, fill in the canvas and check how much does it fit reality. If you are working on a new business proposition then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour. <div>AI chatbot for banking industry which helps resolve the issues of offline banking. This solution allows improved efficient support, reduced wait times. cost-effective 24/7</div>	8. CHANNELS of BEHAVIOR CH ONLINE Extract channels from Behavior block <div>They get the solution from our online chatbot.</div> OFFLINE Extract channels from Behavior block and use for customer development <div>Customer go to the bank to get a solution.</div>	Extract online & offline CH of BE
	4. EMOTIONS BEFORE / AFTER EM Which emotions do people feel before/after this problem is solved? Use it in your communication strategy. eg. frustration, blocking (can't afford it) > boost, feeling smart, be an example for others (made a smart purchase) <div>frustrated, angry > relieved, relaxed</div>			

4. REQUIREMENT ANALYSIS

4.1 Functional requirements

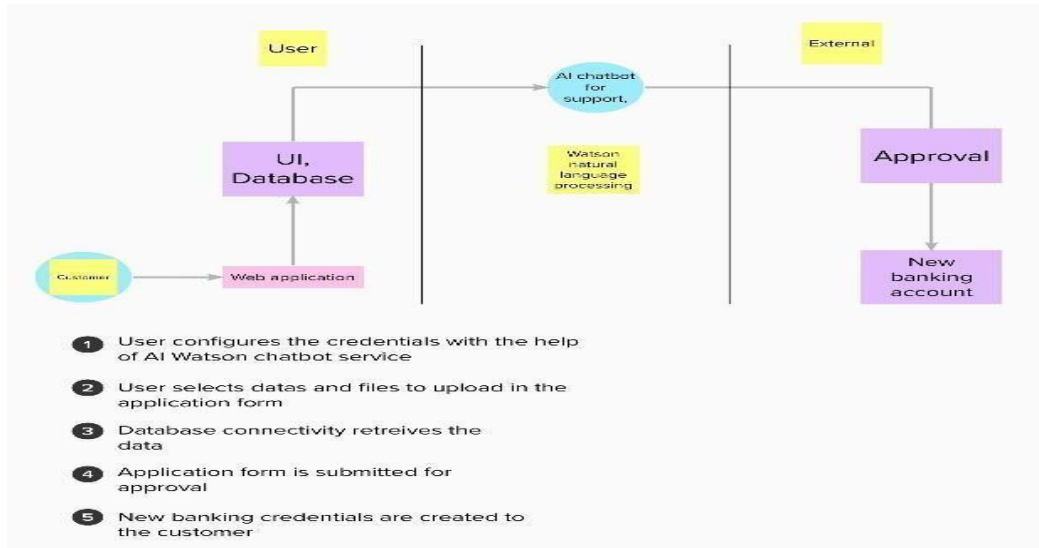
FR NO.	FUNCTIONAL REQUIREMENT (EPIC)	SUB REQUIREMENT (STORY / SUB-TASK)
FR-1	Savings Account Related Actions	<ul style="list-style-type: none">• Type of Savings Account Creation Details• Interest Rate• Minimum Balance• Debit Card• Credit Card
FR-2	Current Account Related Actions	<ul style="list-style-type: none">• Type of Company• Current Account Closure Steps• Update GSTIN• Zero Balance Current Account
FR-3	Loan Account Related Actions	<ul style="list-style-type: none">• Type of Loan• How long for approval• Available Loan Amounts• Loan Status• Joint Loan
FR-4	General Queries Related Actions	<ul style="list-style-type: none">• Bank Working Days• List of Branches• Storage Locker Facility• Currency Conversion Facility• CIBIL• Find a nearest branch
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

4.2 Non-Functional requirements

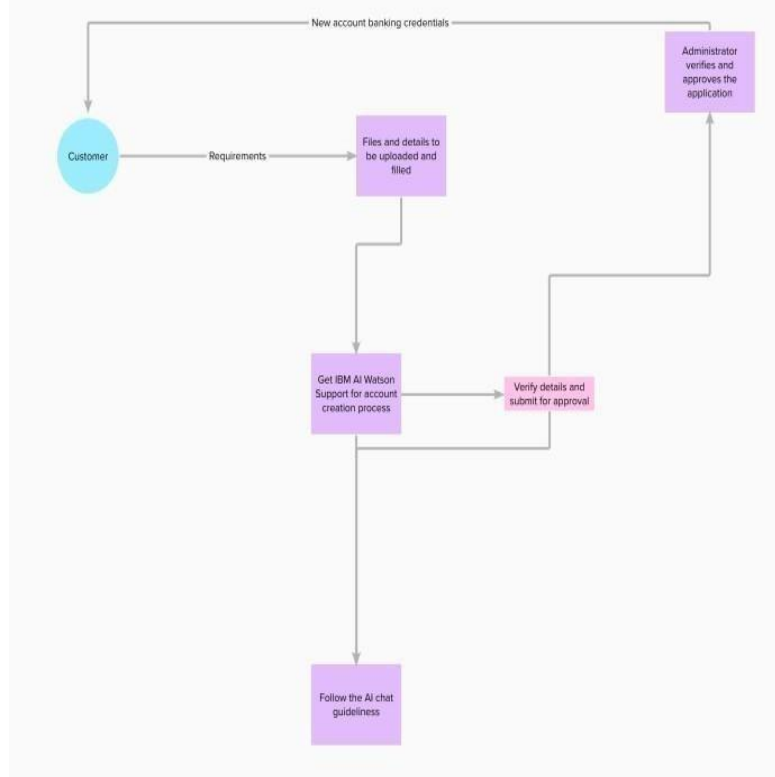
NFR NO.	NON-FUNCTIONAL REQUIREMENT	DESCRIPTION
NFR-1	Usability	Chatbots developed using AI should be able to answer any general banking queries on account creation, loan, net banking, other services etc. It addresses the queries of customers immediately and effectively in a cost efficient manner.
NFR-2	Security	The AI Chatbot maintains a confidential conversation with customers. Chatbot will provide personal and efficient communication between the user and the bank.
NFR-3	Reliability	Chatbots are trained very well using AI to provide solutions for the popular and frequently asked questions, thereby providing the best suited service quickly. Thus AI Chatbots has a reliable end-user experience.
NFR-4	Performance	AI Chatbots are a great way to overcome the limitation of workload of humans. There can be multiple instances of a single chatbot inquiring about different people at the same time. 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	AI Chatbots provide 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.

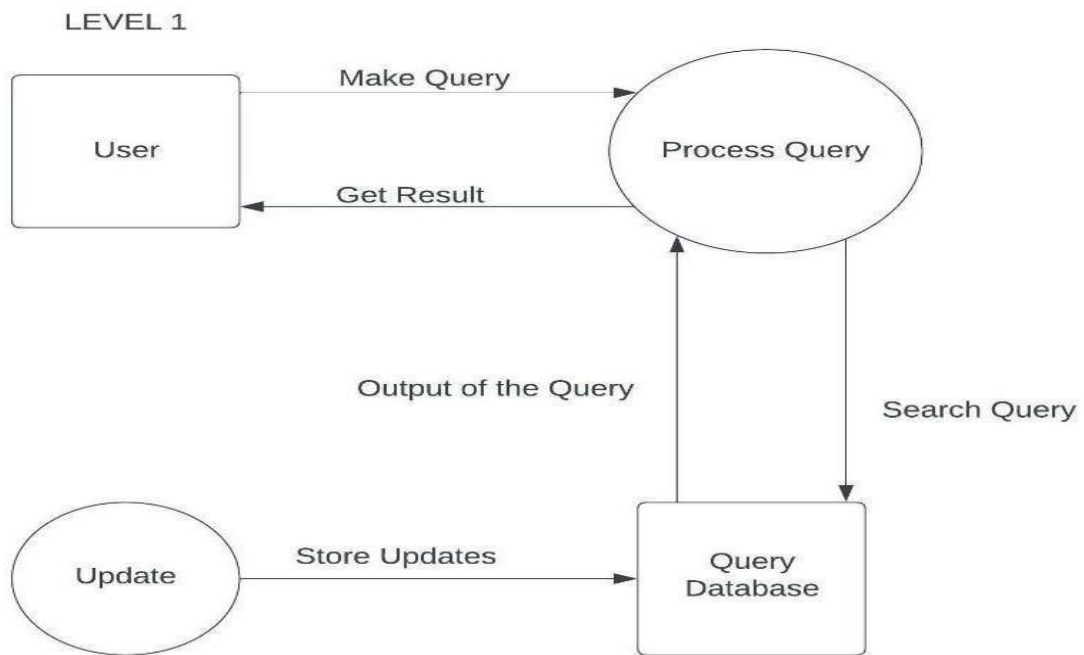
5. PROJECT DESIGN

5.1 Data Flow Diagrams

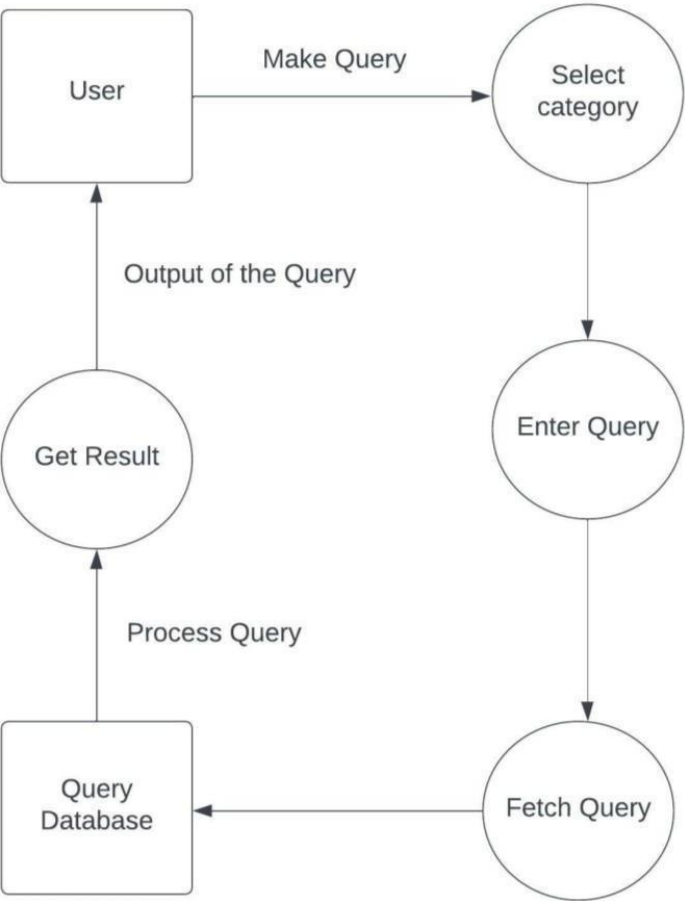


DFD Standard





LEVEL 2



5.2 Solution Architecture

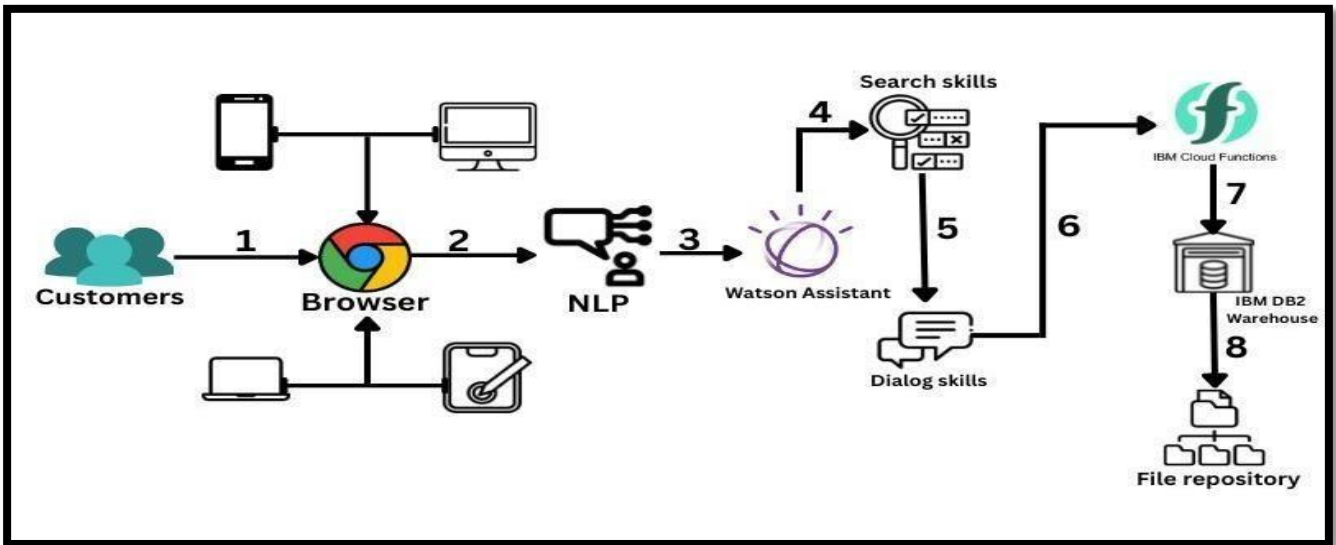
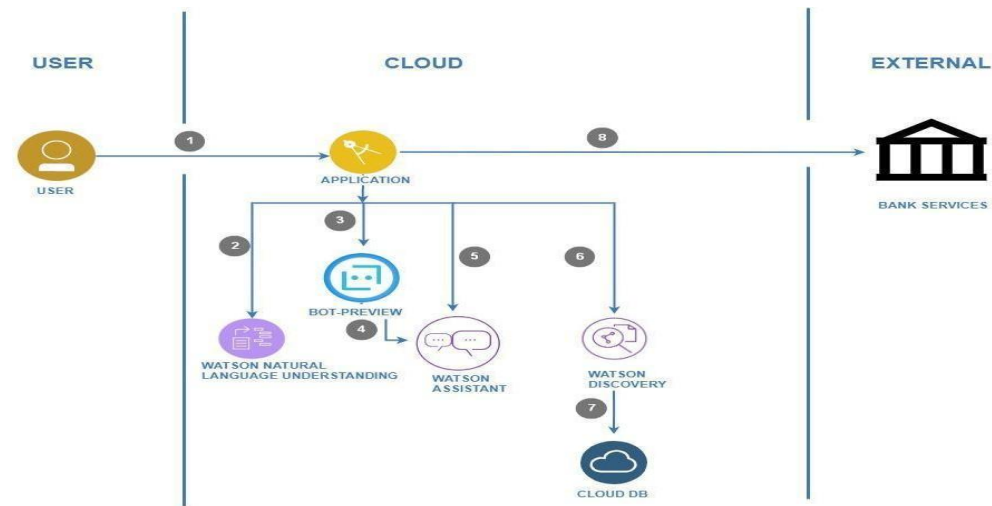


Table-1: Components & Technologies

S.no	Component	Description	Technology
1	User Interface	A Customer interacts with the application in the bank website.	Python, HTML5, CSS, JavaScript / Angular Js / React Js etc.
2	Application Logic-1	Customer's message and query analysing.	Natural Language Processing , Natural Language Understanding
3	Application Logic-2	Identifying intents and entities.	IBM Watson Assistant
4	Application Logic-3	Building and training the models.	IBM Watson Studio
	Application Logic-4	Deployment	Python Flask
5	Database	Data Type Dialog, Intent etc. The customer's query statistics and trained model data are stored and configured.	MySQL, NOSQL
6	Cloud Database	Database Service on Cloud.	IBM DB2, IBM Cloudnet etc.
7	File Storage	The datasets are saved.	IBM Block Storage or Other Storage Service or Local Files stem
8	External API-1	Begin the conversation. Implement language and advanced text analytics into chatbot.	IBM Watson Assistant API
9	External API-2	Banking API -Data transfer between two systems and data accessibility.	Banking API
10	Machine Learning Model	Models of deep learning for intent detection and other tasks.	Object Recognition Model

11	Infrastructure (Server/Cloud)	Publishing the software application on the local systems.	Python Flask, Cloud Foundry, Kubernetes,
----	----------------------------------	---	---

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 Loan Amounts that can be offered for corresponding Loan Accounts chosen	I can clear my queries regarding loan amounts of loan account	High	Sprint-2
		USN-8	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

USER TYPE	FUNCTIONAL REQUIREMENT (EPIC)	USER STORY NUMBER	USER STORY / TASK	ACCEPTANCE CRITERIA	PRIORITY	RELEASE
		USN-10	As a user, I want to check my CIBIL score for my loan application and to ensure whether my loan application is approved by the bank.	I can clear my queries regarding CIBIL score of loan application	Medium	Sprint 3
		USN-11	As a user, I want to get the procedure details for maintaining Storage Locker facility of my bank account	I can clear my queries regarding storage locker facilities of bank account	High	Sprint-3
	Net Banking Related Actions	USN-12	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-13	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-14	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-15	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-16	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 AND 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.	1 2	High	Padmakar Neeraj Bhanu Prakash Mahesh
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	Neeraj Padmakar Mahesh
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	Neeraj Padmakar
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	Bhanu Prakash Mahesh
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 Banking	5	High	Mahesh
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	Neeraj Bhanu Prakash
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	1 0	High	Padmakar Bhanu Prakash
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.	1 0	High	Padmakar Neeraj Bhanu Prakash Mahesh
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.	1 5	High	Padmakar Neeraj Bhanu Prakash Mahesh
Sprint-4		USN-10	Improving the model efficiency whenever needed/As a user, I can see new updated chatbot in Future days.	5	Moderate	Bhanu Prakash Mahesh Padmakar Neeraj

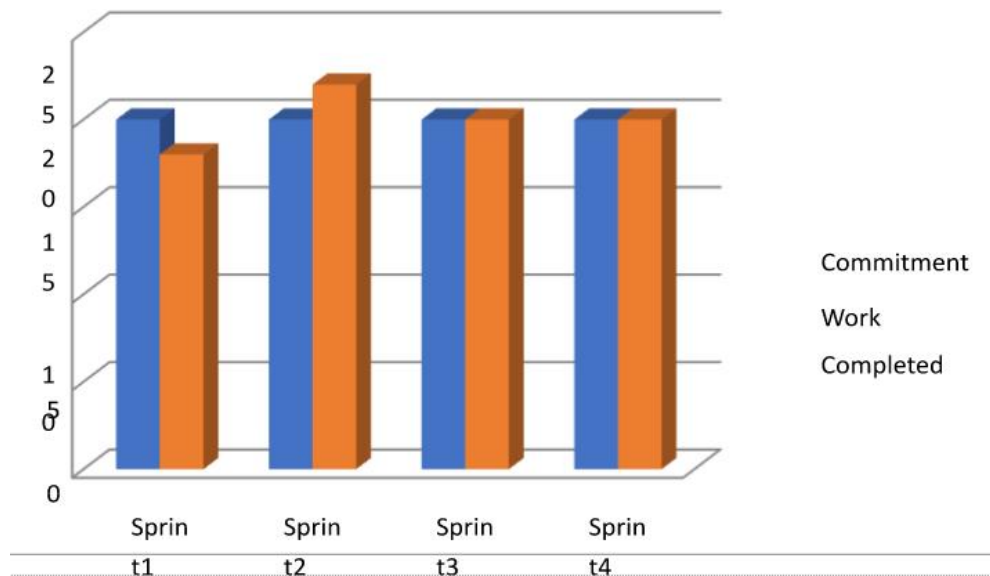
Sprint-3		USN-8	Integration of Flask webpage with the chatbotassistant to provide a framework/As a user, I can see a webpage to access the chatbot.	1 0	High	Padmakar Neeraj Bhanu Prakash Mahesh
----------	--	-------	---	--------	------	---

6.2 Sprint Delivery Schedule

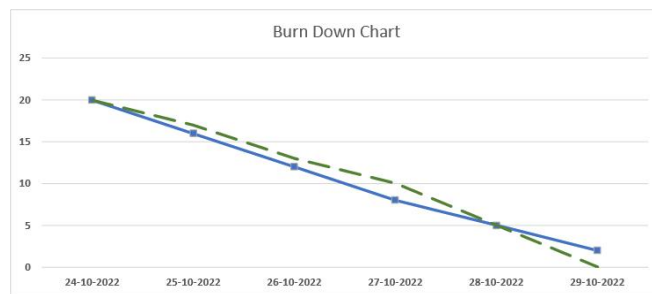
Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022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

SPRINT	TOTAL STORY POINTS	DURATION	AVERAGE VELOCITY
Sprint-1	20	6 Days	$20/6 = 3.33$
Sprint-2	20	6 Days	$20/6 = 3.33$
Sprint-3	20	6 Days	$20/6 = 3.33$
Sprint-4	20	6 Days	$20/6 = 3.33$
Overall	80	24 Days	$80/24 = 3.33$

Velocity chart:



Burn down chart:



Sprint 1



Sprint 2



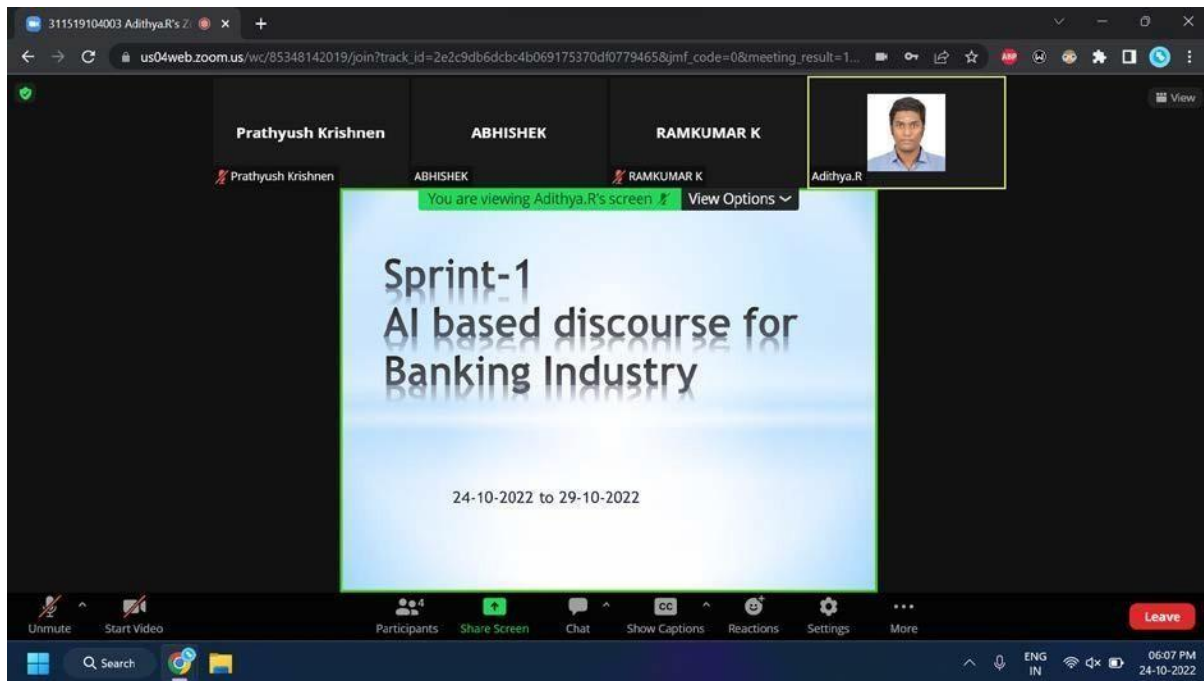
Sprint 3



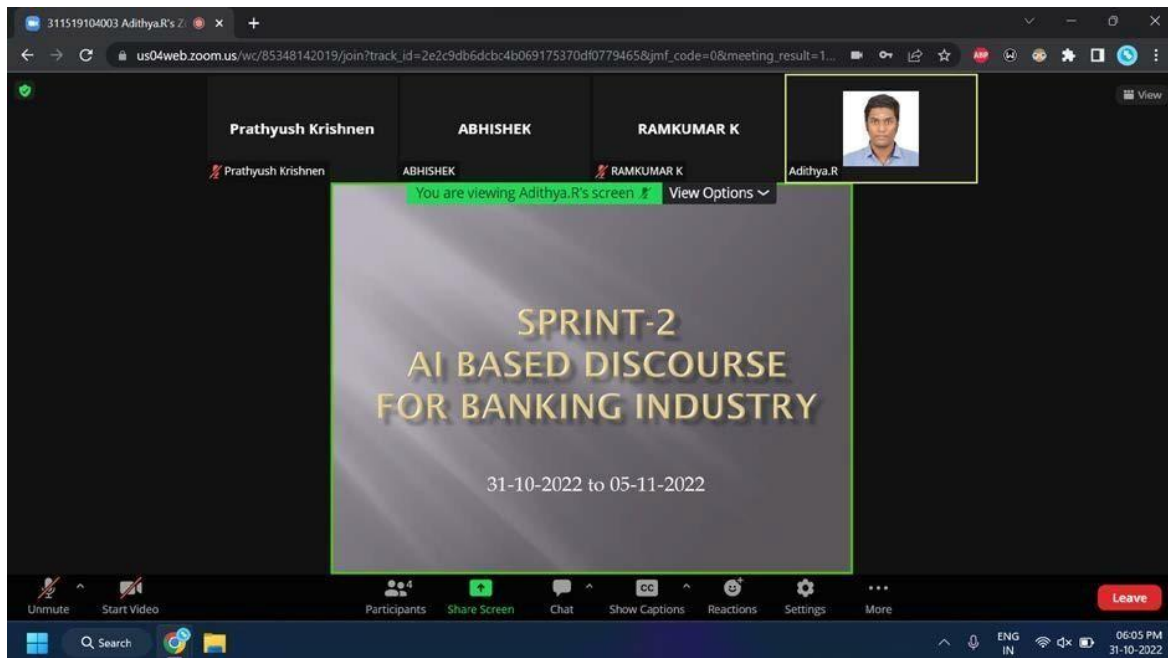
Sprint 4

Stand-up Meeting Screenshots

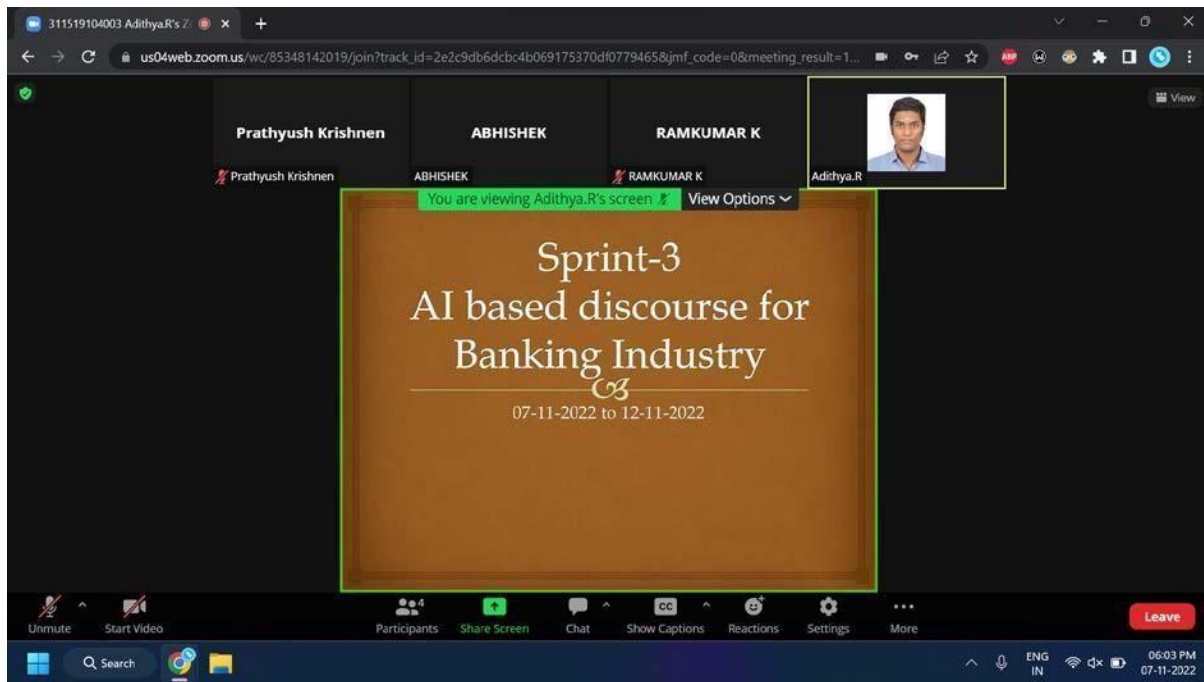
Sprint 1



Sprint 2

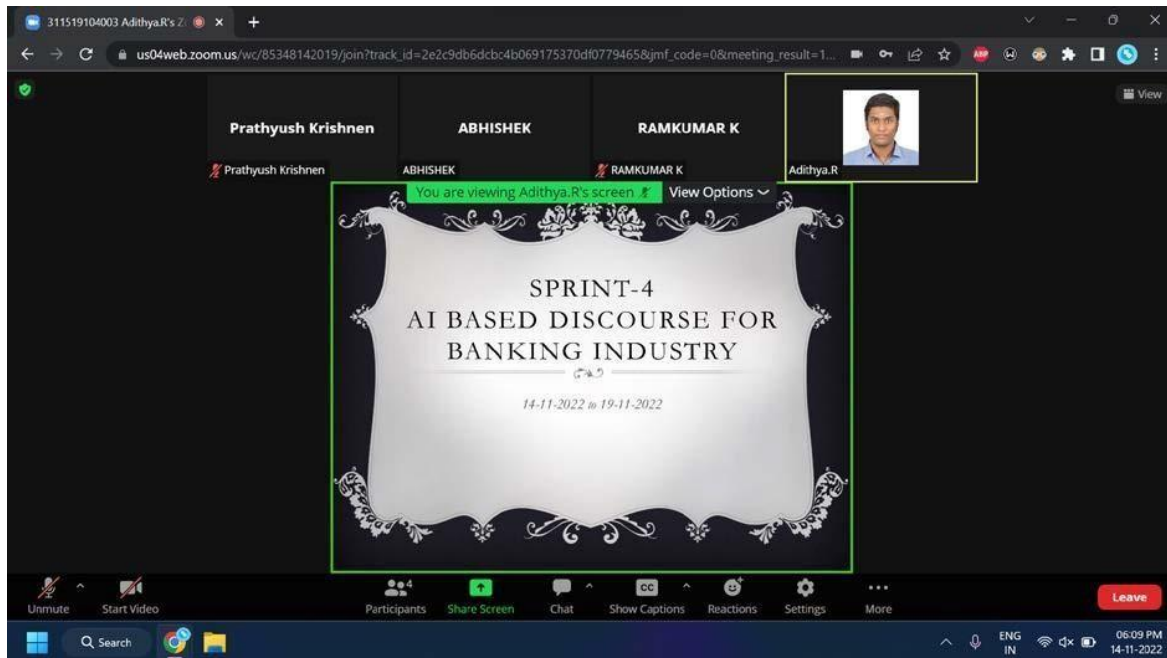


Sprint 3



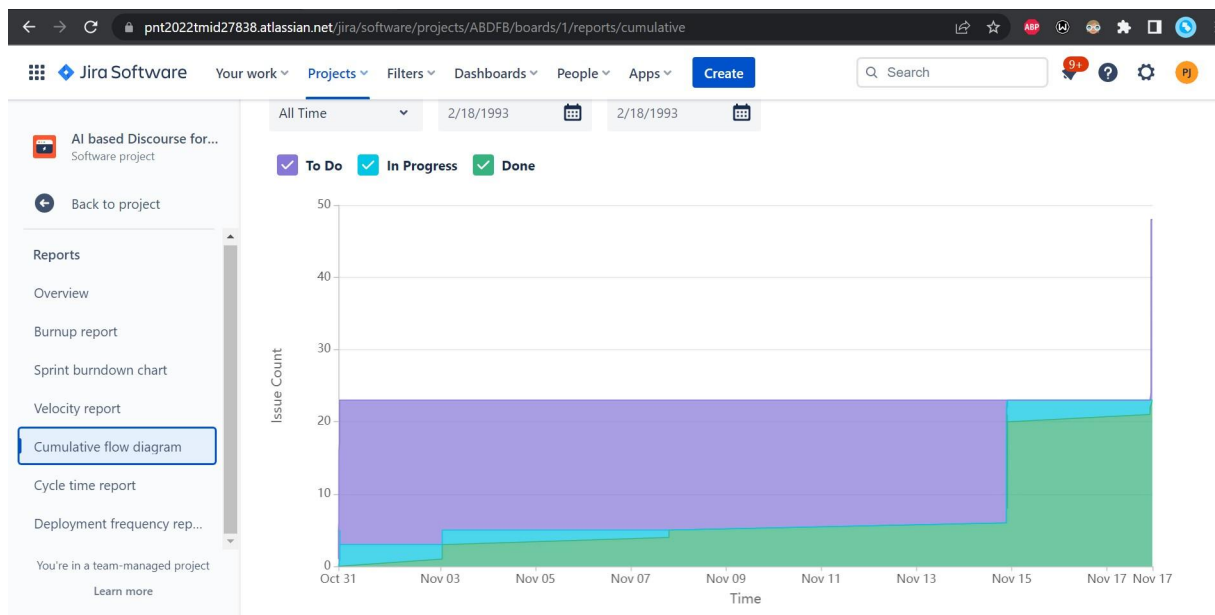
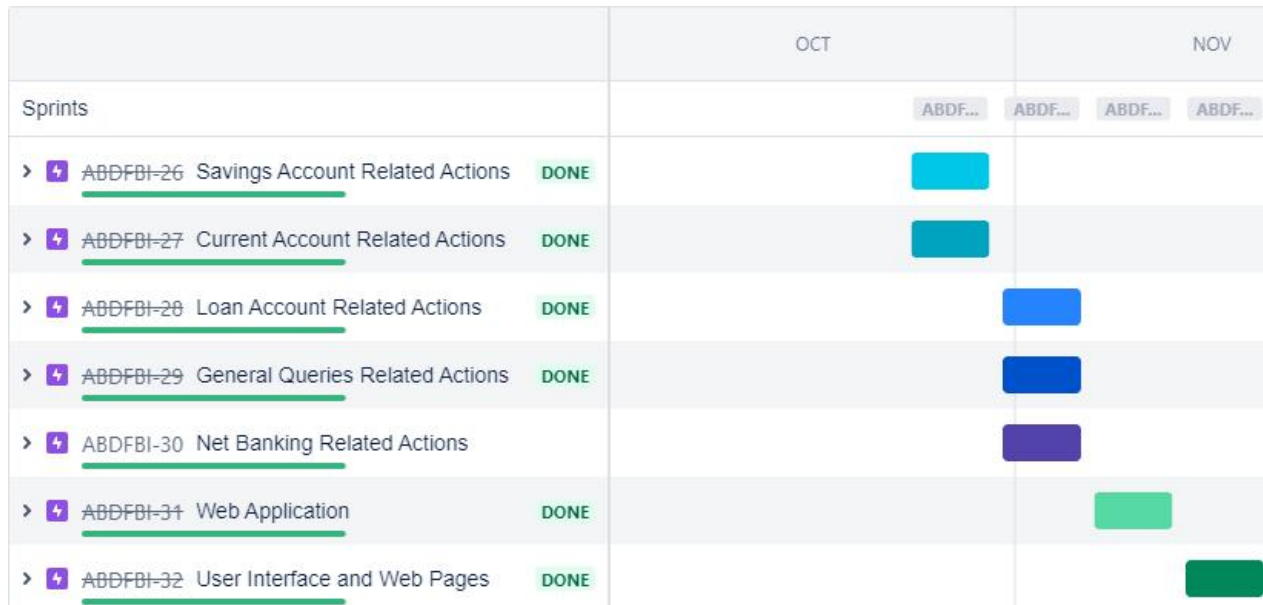
A screenshot of a Zoom meeting interface. The top bar shows the meeting ID 311519104003 and the host Adithya.R's Z. The address bar displays the Zoom URL. The top navigation bar includes participant names: Prathyush Krishnen, ABHISHEK, RAMKUMAR K, and Adithya.R. A green banner in the center reads "You are viewing Adithya.R's screen" with a "View Options" dropdown. The main content area features a brown background with the text "Sprint-3 AI based discourse for Banking Industry" and the dates "07-11-2022 to 12-11-2022". The bottom toolbar contains icons for Unmute, Start Video, Participants, Share Screen, Chat, Show Captions, Reactions, Settings, and More. The system tray at the bottom shows the Windows taskbar, search bar, and system clock indicating 06:03 PM on 07-11-2022.

Sprint 4



A screenshot of a Zoom meeting interface. The top bar shows the meeting ID 311519104003 and the host Adithya.R's Z. The address bar displays the Zoom URL. The top navigation bar includes participant names: Prathyush Krishnen, ABHISHEK, RAMKUMAR K, and Adithya.R. A green banner in the center reads "You are viewing Adithya.R's screen" with a "View Options" dropdown. The main content area features a white background with a decorative border and the text "SPRINT-4 AI BASED DISCOURSE FOR BANKING INDUSTRY" and the dates "14-11-2022 to 19-11-2022". The bottom toolbar contains icons for Unmute, Start Video, Participants, Share Screen, Chat, Show Captions, Reactions, Settings, and More. The system tray at the bottom shows the Windows taskbar, search bar, and system clock indicating 06:09 PM on 14-11-2022.

6.3 Reports from JIRA



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

7.1 Feature 1

Python Flask

Python Flask is used to develop chatbot applications using python. Flask is mainly used to render and integrate the chatbot application in the browser by providing API. By running the python application, the suitable server domain link is obtained and run in the browser.

HTML

The HTML and CSS is used to design the overall chatbot UI. HTML is used to add UI components and CSS is used to add style to those components. IBM watson assistant deploys HTML code to train the Chatbot.

```
<!DOCTYPE html>
<html lang="en">

<head>
<meta charset="UTF-8">
<meta http-equiv="X-UA-Compatible" content="IE=edge">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<title>Banking Bot</title>

<link
href="https://fonts.googleapis.com/css?family=Open+Sans:300,300i,400,400i,600,600i,700,700i|Raleway:300,300i,400,400i,500,500i,600,600i,700,700i|Poppins:300,300i,400,400i,500,500i,600,600i,700,700i" rel="stylesheet">

<link rel="icon" href="https://cdn-icons-png.flaticon.com/512/5226/5226034.png" type="image/x-icon">

<script src="https://kit.fontawesome.com/ffb80bac3c.js" crossorigin="anonymous"></script>
</head>

<style>
body {
    background: url(https://media.istockphoto.com/id/1337977426/photo/dark-gray-and-black-grunge-cement-wall-studio-room-space-product-background-template.jpg?b=1&s=170667a&w=0&k=20&c=4dVCV5KtJKEhuQtp5dbnFmwMBAzNknz35VUIa0C3KoE
    =);
    background-size: cover;
}

body:before {
    content: "";
    background: url("https://wallpaperaccess.com/full/272740.jpg");
    background-size: cover;
```

```
background: rgba(7, 0, 0, 0.889);
position: absolute;
top: 0;
bottom: 0;
left: 0;
right: 0;
}
```

```
.main_txt h1 {
position: relative;
margin: 0;
padding-top: 110px;
font-size: 57px;
font-weight: 800;
line-height: 72px;
color: #f9fbfc;
font-family: "Poppins", sans-serif;
text-align: center;
}
```

```
.main_txt h2 {
position: relative;
color: #fefbfb;
margin: 15px 0 0 0;
font-size: 22px;
text-align: center;
font-family: "Raleway", sans-serif;
font-weight: 500;
}
```

```
.icon-box {
padding: 25px 30px;
position: relative;
overflow: hidden;
background: rgba(15, 0, 0, 0.521);
box-shadow: 0 0 29px 0 rgba(18, 66, 101, 0.352);
border-radius: 10px;
display: inline-block;
font-family: "Open Sans", sans-serif;
width: 200px;
color: #444444;
margin-right: 5px;
margin-top: 100px;
margin-left: 30px;
}
```

```
.icon-box .title a {
text-decoration: none;
color: #0295ff;
margin-bottom: 12px;
font-size: 18px;
```

```
text-align: center;
font-family: "Raleway", sans-serif;
font-weight: 500;
}
```

```
.icon-box i {
color: #0295ff;
}
```

```
.icon-box:hover {
transform: scale(1.08);
}
```

</style>

```
<script>
window.watsonAssistantChatOptions = {
integrationID: "7d992d32-e684-4531-8b5b-aa203b5f7b44", // The ID of this integration.
region: "us-south", // The region your integration is hosted in.
serviceInstanceID: "5520d155-ab45-4e86-a306-478e4b61a61f", // 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>
<div class="main_txt">
<h1>BANKING INDUSTRY</h1>
<h2>BE SAFE, BE SECURE</h2>
</div>
```

```
<div class="icon-box">
<i class="fa-solid fa-user fa-2x"></i>
<h4 class="title"><a href="#">Account</a></h4>

</div>
```

```
<div class="icon-box">
<i class="fa-solid fa-circle-question fa-2x"></i>
<h4 class="title"><a href="#">General Queries</a></h4>

</div>
```


<div class="icon-box">

<i class="fa-solid fa-money-check-dollar fa-2x"></i>

<h4 class="title">Card Services</h4>

</div>

<div class="icon-box">

<i class="fa-solid fa-mobile-screen-button fa-2x"></i>

<h4 class="title">Net Banking</h4>

</div>

<div class="icon-box">

<i class="fa-solid fa-sack-dollar fa-2x"></i>

<h4 class="title">Loan</h4>

</div>

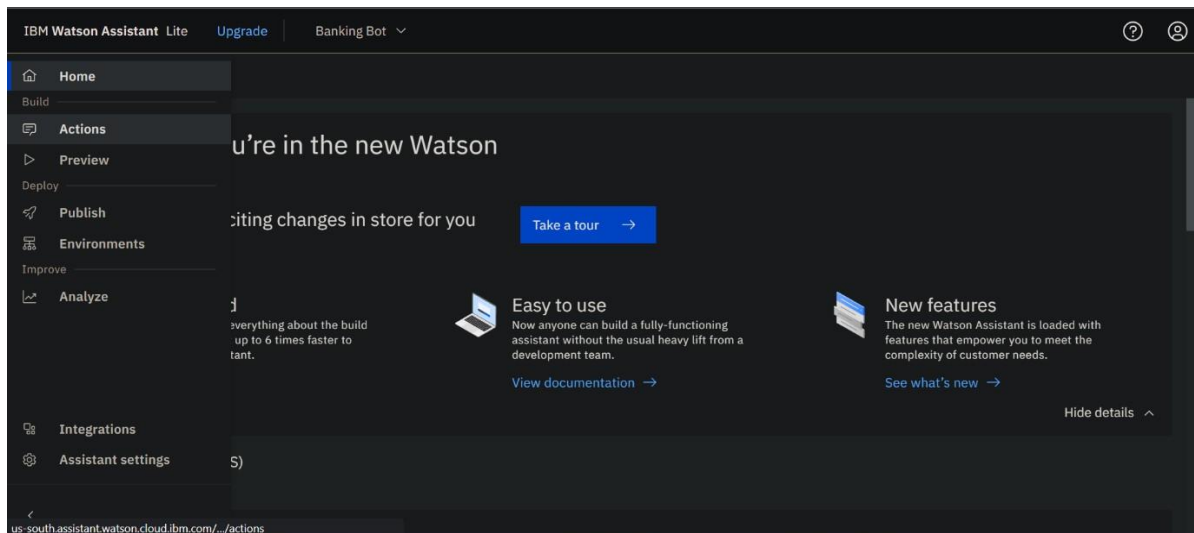
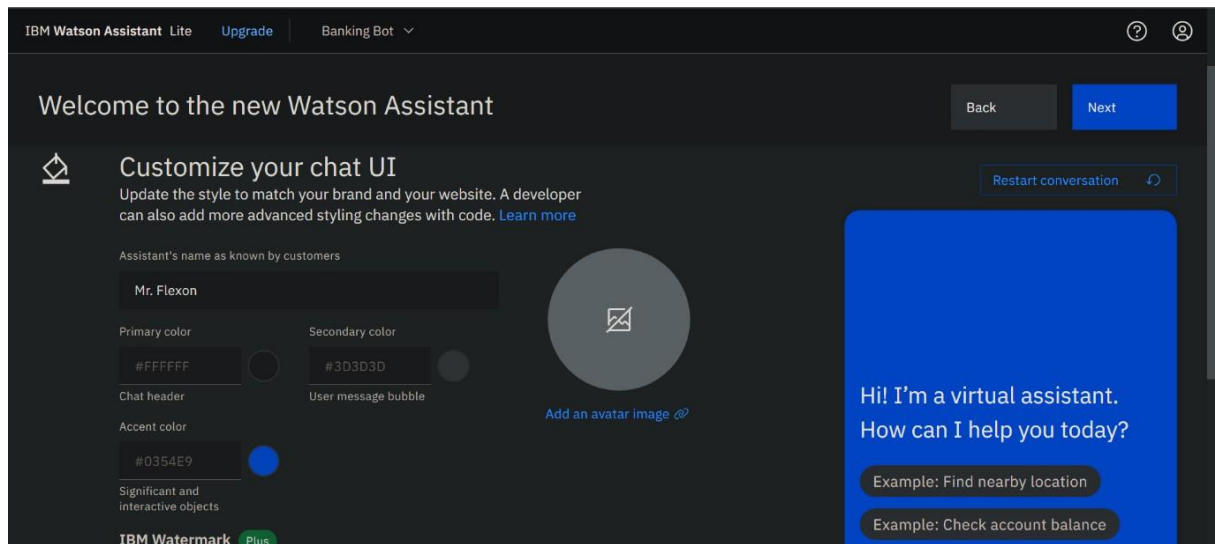
</body>

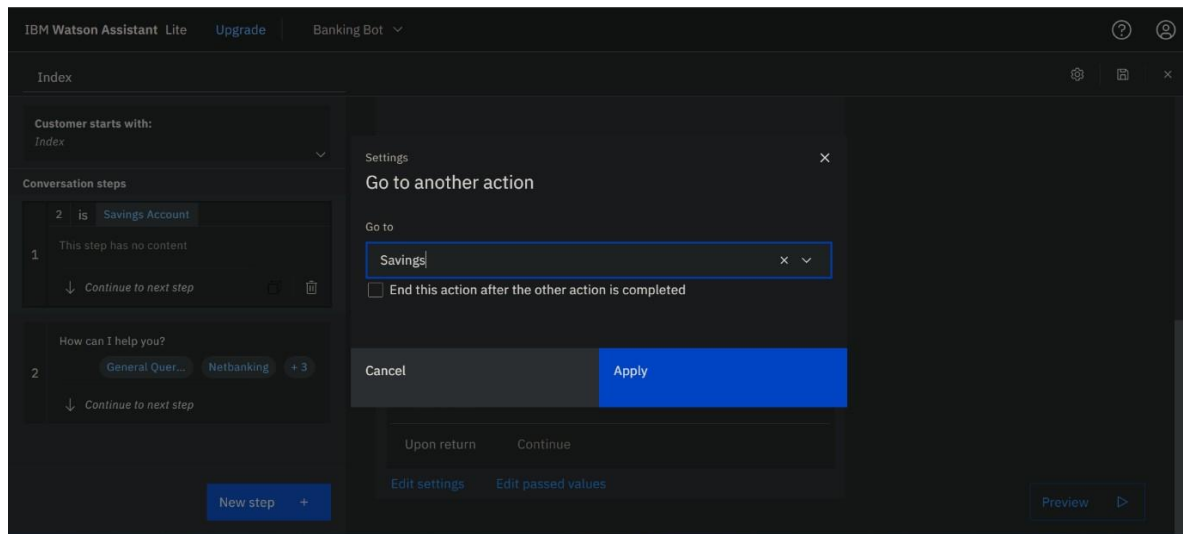
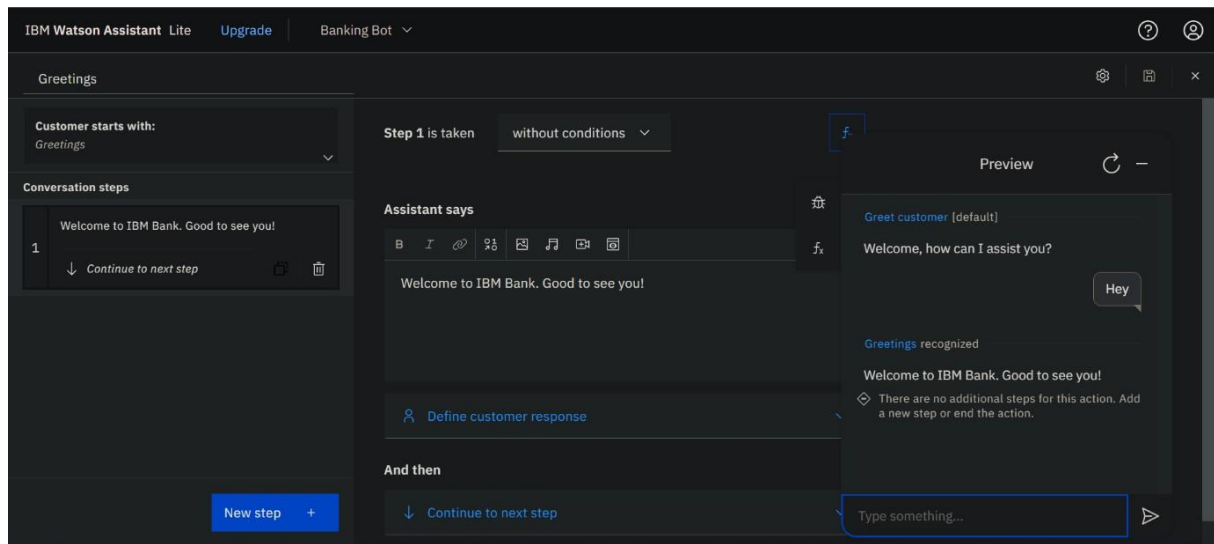
</html>

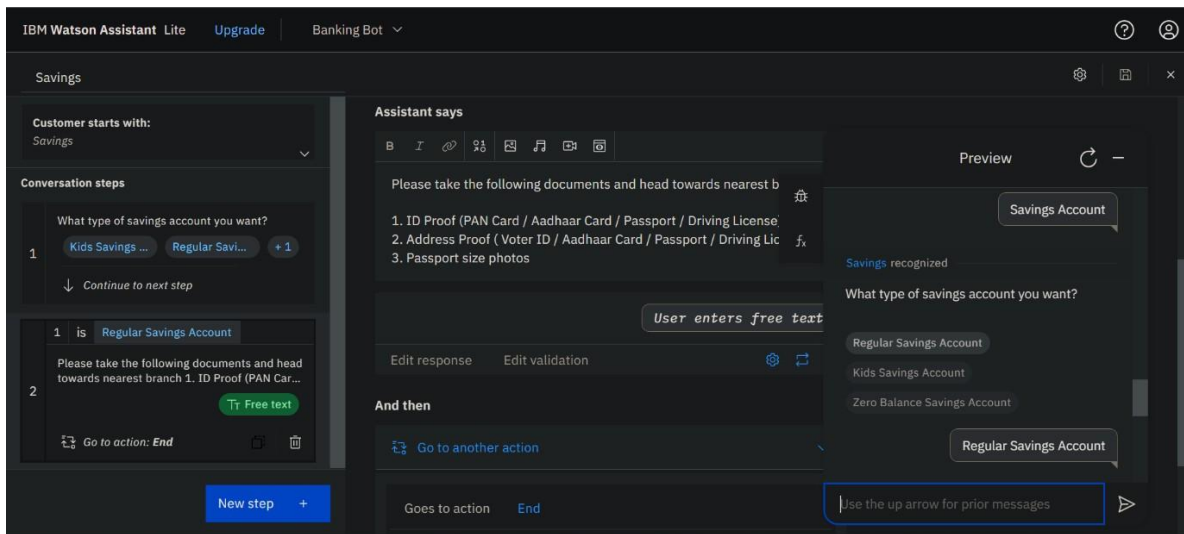
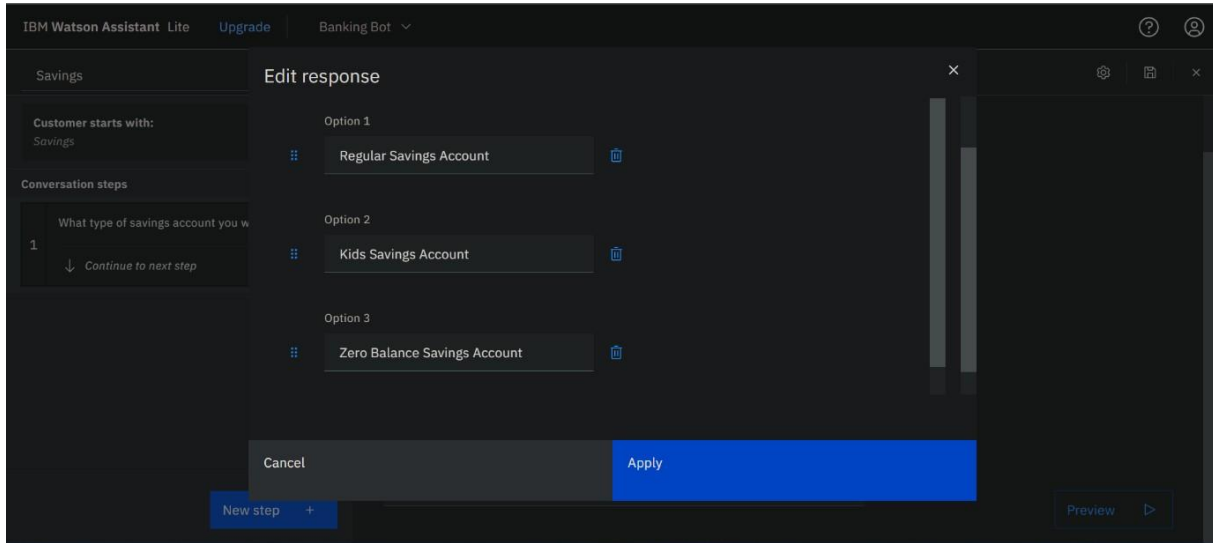
7.2 Feature 2

IBM CHATBOT:

- Our chatbot is able to guide a customer to create a bank account.(Both current and savings account)
- Our chatbot is able to answer loan queries.
- Our chatbot is able to answer general banking queries.
- Our chatbot is able to answer queries regarding net banking.







IBM Watson Assistant LiteUpgradeBanking Bot

Savings

2

Tr Free text

Go to action: End

What type of savings account do you want to create?

Kids Savings ...Regular Savi...+ 1

Continue to next step

3 is Regular Savings Account

4

Tr Free text

Go to action: End

New step +

Please take the following documents and head towards nearest branch

1. ID Proof (PAN Card / Aadhaar Card / Passport / Driving License)

2. Address Proof (Voter ID / Aadhaar Card / Passport / Driving License)

3. Passport size photos

User enters free text

Edit responseEdit validation

And then

Go to another action

Goes to actionEnd

Pass values

Upon returnContinue

Preview

8. TESTING

8.1 Test Cases

	Test Scenarios
1	Verify user is able to open and view chatbot UI
2	Verify user is able to interact with chatbot or not
3	Verify chatbot is able to respond to user queries immediately
4	Verify chatbot is able to provide options for user to choose various choices
	Savings Account Related Actions
1	Verify user is able to select type of savings account
2	Verify user is able to know the procedure to create savings account for selected type
3	Verify user is check the minimum balance
4	Verify user is able to find interest rate
	Current Account Related Actions
1	Verify user is able to select type of company
2	Verify user is able to know the procedure to create current account for selected type
3	Verify user is able to know about zero balance current account
4	Verify user is able to know the procedure to close current account
	Loan Account Related Actions
1	Verify user is able to choose options for selecting type of available loan policies
2	Verify user is able to know about available loan amounts
3	Verify user is able to check the loan status
4	Verify user is able to know about joint loan
	General Query Related Actions
1	Verify user is able to know about bank working days
2	Verify user is able to know about list of branches
3	Verify user is able to find the nearest branch
4	Verify user is able to know about storage locker facility
5	Verify user is able to know about currency conversion facility
	Net banking Related Actions
1	Verify user is able to know the procedure to login netbanking account
2	Verify user is able to know the procedure to change netbanking password
3	Verify user is able to choose options for selecting type of fund transfers
4	Verify user is able to know about daily transaction limit

8.2 User Acceptance Testing

Test case ID	Feature Type	Component	Test Scenario	Pre-Requsite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Comments	TC for Automation(Y/N)	BUGID	Executed By
Chatbot_TC_OO1	UI	Home Page	Verify user is able to open and view chatbot UI	None	1.Enter URL and click go 2.Click on chatbot icon 3.Verify chatbot UI displayed or not	URL link	Chatbot UI is able to be viewed by user	Working as expected	Pass	-	N	-	Bhannu Prakash
Chatbot_TC_OO2	Functional	Home Page	Verify user is able to interact with chatbot or not	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter	User query	User is able to interact with chatbot easily	Working as expected	Pass	-	N	-	Padmakar
Chatbot_TC_OO3	Functional	Home page	Verify chatbot is able to respond to user queries immediately	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter	User query	Chatbot is able to provide instant replies for user queries	Working as expected	Pass	-	N	-	Neeraj
Chatbot_TC_OO4	Functional	Home page	Verify chatbot is able to provide options for user to choose various choices	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter	User query	Chatbot is able to provide options for users to choose various choices	Working as expected	Pass	-	N	-	Mahesh
Savings_TC_OO1	UI	Chatbot	Verify user is able to select type of savings account	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to select type of savings account	Working as expected	Pass	-	N	-	Padmakar
Savings_TC_OO2	Functional	Chatbot	Verify user is able to know the procedure to create savings account for selected type	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to know the steps to create savings account for selected type	Working as expected	Pass	-	N	-	Bhannu Prakash
Savings_TC_OO3	Functional	Chatbot	Verify user is able to check the minimum balance	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to check the minimum balance	Working as expected	Pass	-	N	-	Neeraj
Savings_TC_OO4	Functional	Chatbot	Verify user is able to find interest rate	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to find interest rate	Working as expected	Pass	-	N	-	Mahesh
Current_TC_OO1	UI	Chatbot	Verify user is able to select type of company	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to select type of company	Working as expected	Pass	-	N	-	Padmakar
Current_TC_OO2	Functional	Chatbot	Verify user is able to know the procedure to create current account for selected type	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to know the steps to create current account for selected type	Working as expected	Pass	-	N	-	Bhannu Prakash
Current_TC_OO3	Functional	Chatbot	Verify user is able to know about zero balance current account	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to know about zero balance current account	Working as expected	Pass	-	N	-	Neeraj
Current_TC_OO4	Functional	Chatbot	Verify user is able to know the procedure to close current account	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to know the procedure to close current account	Working as expected	Pass	-	N	-	Padmakar
Loan_TC_OO1	UI	Chatbot	Verify user is able to choose options for selecting type of available loan policies	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to choose options to select type of available loan policies	Working as expected	Pass	-	N	-	Mahesh
Loan_TC_OO2	Functional	Chatbot	Verify user is able to know about available loan amounts	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to know about available loan amounts	Working as expected	Pass	-	N	-	Padmakar
Loan_TC_OO3	Functional	Chatbot	Verify user is able to check the loan status	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to check the loan status	Working as expected	Pass	-	N	-	Neeraj
Loan_TC_OO4	Functional	Chatbot	Verify user is able to know about joint loan	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to know about joint loan	Working as expected	Pass	-	N	-	Bhannu Prakash
General_TC_OO1	Functional	Chatbot	Verify user is able to know about bank working days	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to know about bank working days	Working as expected	Pass	-	N	-	Mahesh
General_TC_OO2	Functional	Chatbot	Verify user is able to know about list of branches	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to know about list of branches	Working as expected	Pass	-	N	-	Neeraj
General_TC_OO3	Functional	Chatbot	Verify user is able to find the nearest branch	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to find the nearest branch	Working as expected	Pass	-	N	-	Padmakar
General_TC_OO4	Functional	Chatbot	Verify user is able to know about storage locker facility	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to know about storage locker facility	Working as expected	Pass	-	N	-	Bhannu Prakash
General_TC_OO5	Functional	Chatbot	Verify user is able to know about currency conversion facility	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to know about currency conversion facility	Working as expected	Pass	-	N	-	Neeraj
Netbanking_TC_OO1	Functional	Chatbot	Verify user is able to know the procedure to login netbanking account	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to know the steps to login netbanking account	Working as expected	Pass	-	N	-	Mahesh
Netbanking_TC_OO2	Functional	Chatbot	Verify user is able to know the procedure to change netbanking password	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to know the steps to change netbanking password	Working as expected	Pass	-	N	-	Padmakar
Netbanking_TC_OO3	UI	Chatbot	Verify user is able to choose options for selecting type of fund transfers	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to choose options for selecting type of fund transfers	Working as expected	Pass	-	N	-	Bhannu Prakash
Netbanking_TC_OO4	Functional	Chatbot	Verify user is able to know about daily transaction limit	Chatbot is accessible	1.Click on chatbot icon 2.Type the query in the chat window 3.Press enter 4.Select the desired option	User query	User is able to know about daily transaction limit	Working as expected	Pass	-	N	-	Neeraj

AI based Discourse for...

Software project

Back to project

Test Cases

Import Tests

PLANNING AND EXECUTION

Cycle Summary

Search Test Executions

Manage Execution Filters

REPORTING

You're in a team-managed project

Learn more

Cycle Summary

User Acceptance Testing

Build : Total Executions : 25 Start Date : Environment : Cycle Executions : 25 End Date : Created By : Prathyush Krishnen J Total Executed : 25 Description : Total Execution Time : 0m Total Logged Time : 0m Executions Not Tracked : 25

Select All Delete Columns Add Tests

ID	Status	Summary	Defect	Compon...	Label	Tot	Action
ABDFBI-68	PASS	Verify user is able to know the procedure to create current account for selected type	-	-	-	-	E
ABDFBI-69	PASS	Verify user is able to know	-	-	-	-	E

AI based Discourse for...

Software project

Back to project

Manage Execution Filters

REPORTING

Test Summary

Test Metrics

Traceability Matrix

INTEGRATIONS

API Keys

You're in a team-managed project

Learn more

Executions List

Test Cycle	Test Id	Execution Status	Executed By	Execution Date
User Acceptance Testing	10058	PASS	Prathyush Krishnen J	11/17/2022 5:06:25 PM
User Acceptance Testing	10082	PASS	Prathyush Krishnen J	11/17/2022 5:06:27 PM
User Acceptance Testing	10081	PASS	Prathyush Krishnen J	11/17/2022 5:06:30 PM
User Acceptance Testing	10068	PASS	Prathyush Krishnen J	11/17/2022 5:06:16 PM
User Acceptance Testing	10077	PASS	Prathyush Krishnen J	11/17/2022 5:06:20 PM
User Acceptance Testing	10076	PASS	Prathyush Krishnen J	11/17/2022 5:07:31 PM
User Acceptance Testing	10064	PASS	Prathyush Krishnen J	11/17/2022 5:07:34 PM
User Acceptance Testing	10071	PASS	Prathyush Krishnen J	11/17/2022 5:07:39 PM

Projects / AI based Discourse for Banking / Test Summary

Test Summary

Total Tests25

Total Unexecuted0

Total Executed25

TESTS BY VERSIONS

Search

Name : Tests :

Unscheduled25

Showing 1 - 1 of 1 Prev 1 of 1 Next

TESTS BY COMPONENTS

Search

Name : Tests :

No Component25

Showing 1 - 1 of 1 Prev 1 of 1 Next

TESTS BY LABELS

Search

Name : Tests :

No Label25

Showing 1 - 1 of 1 Prev 1 of 1 Next

Test Report

1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the AI based Discourse for Banking Industry project at the time of the release to User Acceptance Testing (UAT).

2. Defect Analysis

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	2	2	6

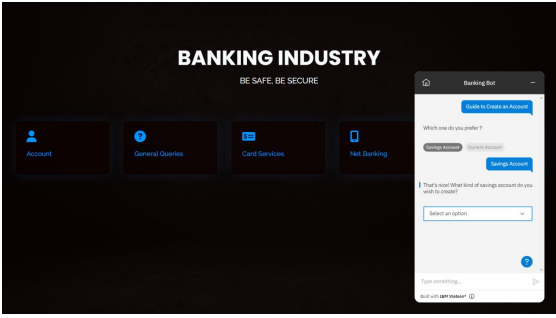
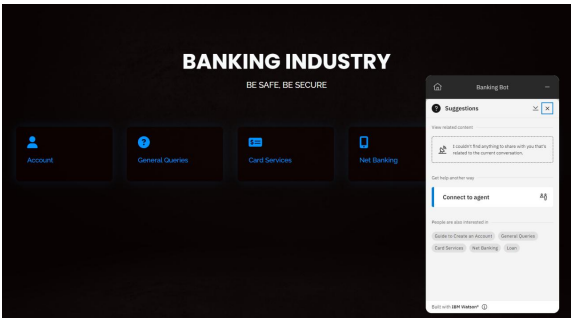
3. Test Case Analysis

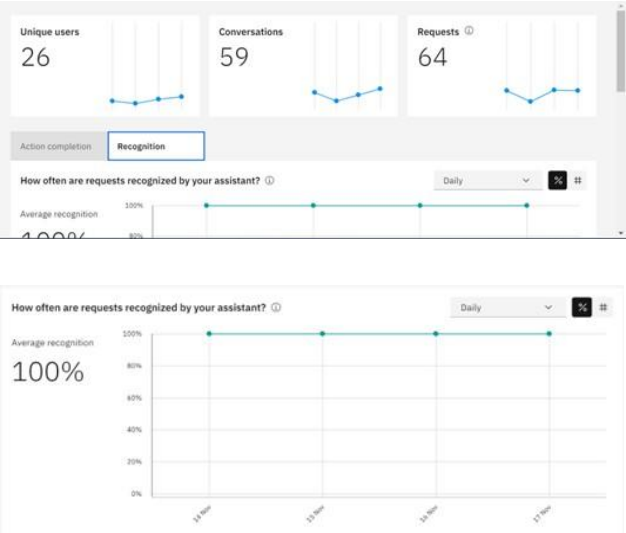
Section	Total Cases	Not Tested	Fail	Pass
Print Engine	0	0	0	0
Client Application	25	0	0	25
Security	0	0	0	0
Outsource Shipping	0	0	0	0
Exception Reporting	0	0	0	0
Final Report Output	25	0	0	25
Version Control	0	0	0	0

9. RESULTS

9.1 Performance Metrics

Model Performance Testing:

S.NO	PARAMETER	VALUES	SCREENSHOT
1.	Model Summary	<p>The chatbot is used by the user to interact and select queries that are populated based on frequently asked questions of banking customers. There can be multiple instances of a single chatbot serving different users at the same time. It quickly responds with expected answers to frequently asked customer queries. 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.</p>	 

2.	Accuracy	<p>Training Accuracy – 100%</p> <p>Validation Accuracy – 100%</p>	 <p>The screenshot displays a dashboard for an assistant's performance. At the top, three summary cards show 'Unique users' (26), 'Conversations' (59), and 'Requests' (64), each with a small line chart. Below these is a 'Recognition' tab under the 'Action completion' section. The main chart area is titled 'How often are requests recognized by your assistant?' and shows a line graph with a constant 100% average recognition rate over four dates: 14 Nov, 15 Nov, 16 Nov, and 17 Nov. The y-axis ranges from 0% to 100% in 20% increments.</p>
----	----------	---	--

10. ADVANTAGES AND DISADVANTAGES

Advantages

1. **Round-the-clock support:** Chatbots provide 24/7 client support, so existing and potential customers can try and solve their banking problems after work hours and on weekends. This ultimately also leads to better customer experience.
2. **Enhanced productivity of bank personnel:** Not all clients' problems require the help of a staff member. Artificial intelligence may successfully deal with minor issues leaving only the most urgent and complicated cases for the human approach.
3. **More convenient mode of communication:** Chatbots may combine various functionalities that would make them convenient for customers of different age groups.

Disadvantages

1. **Internet Issues:** Chatbots will not work without the internet. If there is a network problem, chatbots may stop working and will not respond to client queries.
2. **Requirement of technical knowledge:** Users who make use of chatbots must know how to use chatbots. Otherwise, it is difficult to do interaction with chatbot.
3. **Providing unexpected answers:** Chatbots in some cases may get confused due to prolonged user inputs and may provide irrelevant answers.
4. **Inability to interpret multiple queries:** Chatbots can't understand multiple questions at a time if a user continuously posts queries to it. So it is necessary for a user to post queries one-by-one.

11. CONCLUSION

Chatbots developed using AI are able to answer any frequently asked banking queries on account creation, loan, net banking, other services etc. It addresses the queries of customers immediately and effectively in a cost efficient manner. It eliminates the need for a massive customer care workforce and even reduces the workload of the bank employees whose efforts can be used elsewhere. AI Chatbots provides 24/7 service to clear all customer queries and guide them through all the banking processes. 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. In order to overcome the user satisfaction issues associated with banking services, chatbot will provide personal and efficient communication between the user and the bank. It is built to be the overall virtual assistant that can facilitate customers to ask banking-related questions without visiting the bank or calling up customer service centers as well as providing them with relevant suggestions.

12. FUTURE SCOPE

Chatbots help people obtain the information they need and solve their problems. The technology sector has seen a massive increase in AI development, which has led to the creation of chatbots that can help users easily find the information they need online. AI Chatbots effectively create a strong brand image. They will continue to evolve and play an important role in customer service for businesses.

1. Bots for Internal Business Communications

Chatbots can be used for various purposes, including addressing common problems, communicating with employees, and finishing HR-related tasks and transactional functions. Chatbots for websites are acting as a guide to new employees through company protocols, recording answers for screen questions, and assisting with the onboarding process for new employees. Chatbots can save time for IT desk agents and help with more complicated issues.

2. Content Marketing

Chatbots can communicate with the target market by speaking with them in complete sentences with a natural and easy-going conversational flow. Some markets use these bots to serve customer service and retail, amongst others. Chatbots can segment consumers for future marketing campaigns. This can be incredibly useful for creating more accurate target marketing. Based on the information from dialogue with chatbots, marketers can use this information to help with personalizing brand content.

3. Social Media

Chatbots have better customer interaction rates on social media. Chatbot interactions increase consumer confidence in a brand or business. Customers are informed with daily or weekly announcements about deals, events, and promotions via social media. With time, it is used for voicing opinions, ordering products and services, offering reviews, and even getting in touch with businesses.

4. Use of AI in contact centers

AI chatbots without human involvement can handle simple requests such as changing a password, requesting a balance, scheduling an appointment, etc.

13. APPENDIX

Source Code

```
<!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Banking Bot</title>

  <link
href="https://fonts.googleapis.com/css?family=Open+Sans:300,300i,400,400i,600,600i,700,700i|Raleway:300,300i,400,400i,500,500i,600,600i,700,700i|Poppins:300,300i,400,400i,500,500i,600,600i,700,700i" rel="stylesheet">

  <link rel="icon" href="https://cdn-icons-png.flaticon.com/512/5226/5226034.png" type="image/x-icon">

  <script src="https://kit.fontawesome.com/ffb80bac3c.js" crossorigin="anonymous"></script>
</head>

<style>
  body {
    background: url(https://media.istockphoto.com/id/1337977426/photo/dark-gray-and-black-grunge-cement-wall-studio-room-space-product-background-template.jpg?b=1&s=170667a&w=0&k=20&c=4dVCV5KtJKEhuQtp5dbnFmwMBAzNknz35VUIa0C3KoE=);
    background-size: cover;
  }

  body:before {
    content: "";
    background: url("https://wallpaperaccess.com/full/272740.jpg");
    background-size: cover;
    background: rgba(7, 0, 0, 0.889);
    position: absolute;
    top: 0;
    bottom: 0;
    left: 0;
    right: 0;
  }

  .main_txt h1 {
    position: relative;
    margin: 0;
    padding-top: 110px;
    font-size: 57px;
    font-weight: 800;
    line-height: 72px;
    color: #f9fbfc;
    font-family: "Poppins", sans-serif;
    text-align: center;
  }
```

```
.main_txt h2 {
  position: relative;
  color: #fefbfb;
  margin: 15px 0 0 0;
  font-size: 22px;
  text-align: center;
  font-family: "Raleway", sans-serif;
  font-weight: 500;
}

.icon-box {
  padding: 25px 30px;
  position: relative;
  overflow: hidden;
  background: rgba(15, 0, 0, 0.521);
  box-shadow: 0 0 29px 0 rgba(18, 66, 101, 0.352);
  border-radius: 10px;
  display: inline-block;
  font-family: "Open Sans", sans-serif;
  width: 200px;
  color: #444444;
  margin-right: 5px;
  margin-top: 100px;
  margin-left: 30px;
}
```

```
.icon-box .title a {
  text-decoration: none;
  color: #0295ff;
  margin-bottom: 12px;
  font-size: 18px;
  text-align: center;
  font-family: "Raleway", sans-serif;
  font-weight: 500;
}
```

```
.icon-box i {
  color: #0295ff;
}
```

```
.icon-box:hover {
  transform: scale(1.08);
}
```

</style>

<script>

```
window.watsonAssistantChatOptions = {
  integrationID: "7d992d32-e684-4531-8b5b-aa203b5f7b44", // The ID of this integration.
  region: "us-south", // The region your integration is hosted in.
  serviceInstanceID: "5520d155-ab45-4e86-a306-478e4b61a61f", // 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>
  <div class="main_txt">
    <h1>BANKING INDUSTRY</h1>
    <h2>BE SAFE, BE SECURE</h2>
  </div>

  <div class="icon-box">
    <i class="fa-solid fa-user fa-2x"></i>
    <h4 class="title"><a href="#">Account</a></h4>

  </div>

  <div class="icon-box">
    <i class="fa-solid fa-circle-question fa-2x"></i>
    <h4 class="title"><a href="#">General Queries</a></h4>

  </div>

  <div class="icon-box">

    <i class="fa-solid fa-money-check-dollar fa-2x"></i>
    <h4 class="title"><a href="#">Card Services</a></h4>

  </div>

  <div class="icon-box">
    <i class="fa-solid fa-mobile-screen-button fa-2x"></i>
    <h4 class="title"><a href="#">Net Banking</a></h4>

  </div>

  <div class="icon-box">
    <i class="fa-solid fa-sack-dollar fa-2x"></i>
    <h4 class="title"><a href="#">Loan</a></h4>

  </div>

</body>
</html>
```

<--IBM Chatbot Integration:-->

```
<script>
window.watsonAssistantChatOptions = {
  integrationID: "ffa94b22-82fd-424d-baf0-05322655ecf4", // The ID of this integration.
  region: "us-south", // The region your integration is hosted in.
  serviceInstanceID: "e5ada103-ff26-4155-9a22-6cd24e8a71e0", // 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>
<footer class="u-align-center u-clearfix u-footer u-grey-80 u-footer" id="sec-bfdd"><div
class="u-clearfix u-sheet u-sheet-1">
  <p class="u-small-text u-text u-text-variant u-text-1">Banking ChatBot-2022</p>
</div></footer>
</body></html>
```

HOME.CSS

```
.u-section-1 {
  background-image: url("/static/img/bg.jpg");
  background-position: 50% 50%;
  min-height: 100vh;
}
.u-section-1 .u-layout-wrap-1 {
  width: calc(((100% - 1140px) / 2) + 1140px);
  margin: -18px 0 0 auto;
}
.u-section-1 .u-layout-cell-1
{min-height: 723px;
}
.u-section-1 .u-container-layout-1
{padding: 30px 29px;
}
.u-section-1 .u-line-1
{width: 111px;
height: 6px;
transform-origin: left center 0px;
margin: 111px auto 0 11px;
```

```

}
.u-section-1 .u-text-1
{font-size: 3.75rem;
font-weight: 700;
line-height: 1;
margin: 20px 17px 0 11px;
}
.u-section-1 .u-text-2
{font-style: italic;
margin: 23px 17px 0 11px;
}
.u-section-1 .u-layout-cell-2
{ background-position: 50%
50%;min-height: 723px;
}
.u-section-1 .u-container-layout-2
{padding: 30px;
}
.u-section-1 .u-shape-1
{width: 23px;
height: 23px;
margin: 279px 183px 0 auto;
}
.u-section-1 .u-image-1
{width: 443px;
height: 444px;
margin: -240px 0 0 auto;
}
@media (max-width: 1199px) {
.u-section-1 .u-layout-wrap-1 {
width: calc(((100% - 940px) / 2) + 940px);
}
.u-section-1 .u-layout-cell-1
{min-height: 596px;
}
.u-section-1 .u-text-1
{margin-right: 0;
}
.u-section-1 .u-text-2
{margin-right: 0;
}
.u-section-1 .u-layout-cell-2
{min-height: 596px;
}
.u-section-1 .u-container-layout-2
{padding-left: 27px;
}

```

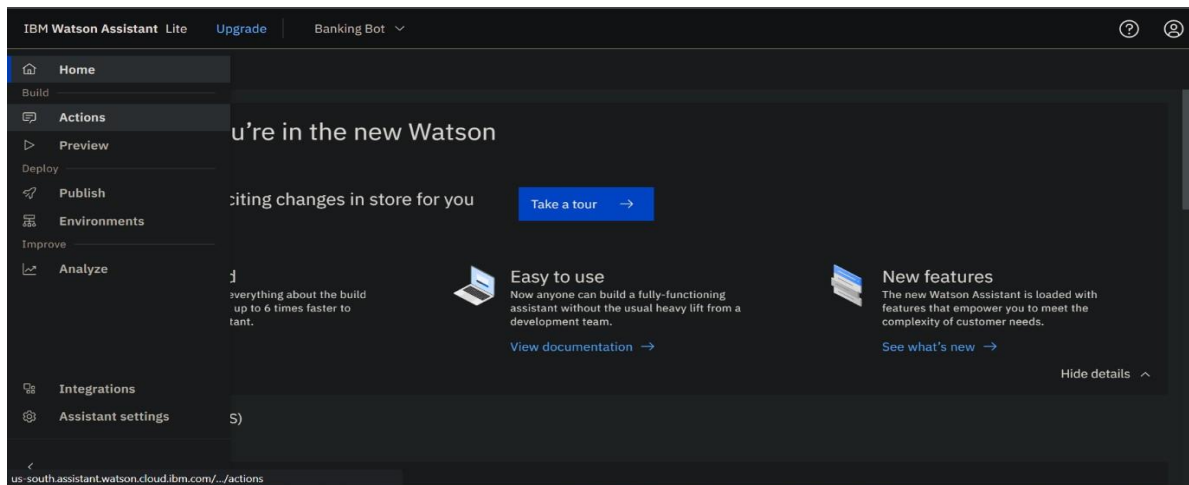
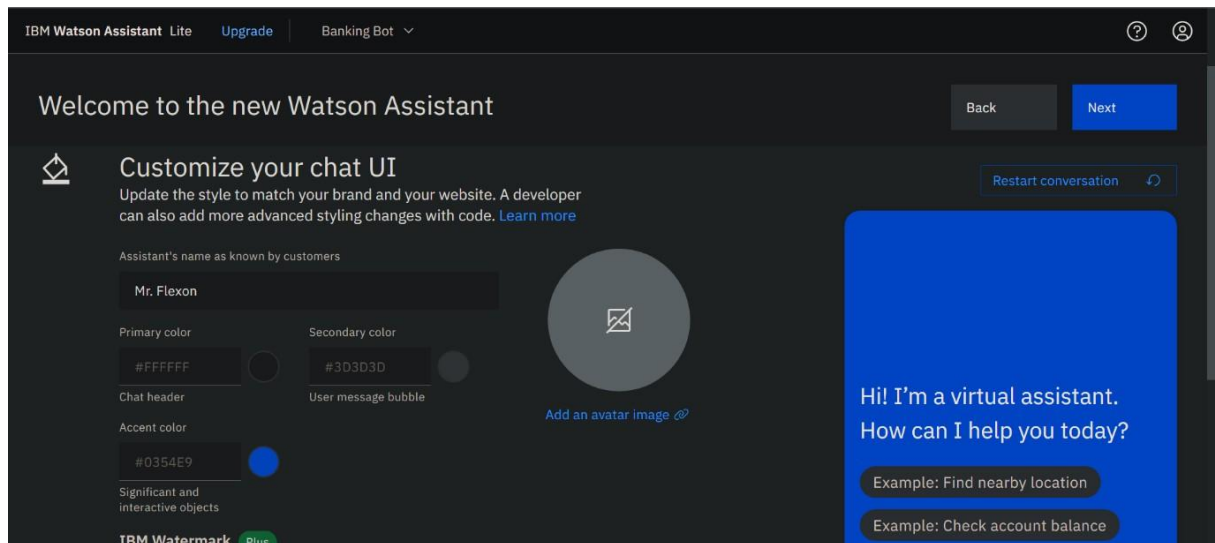
```

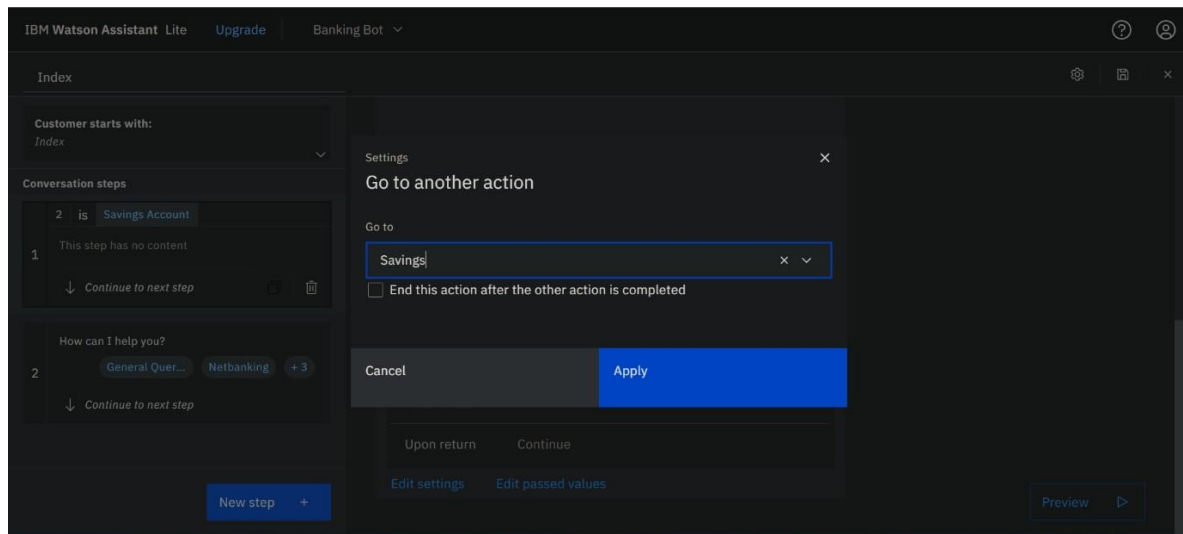
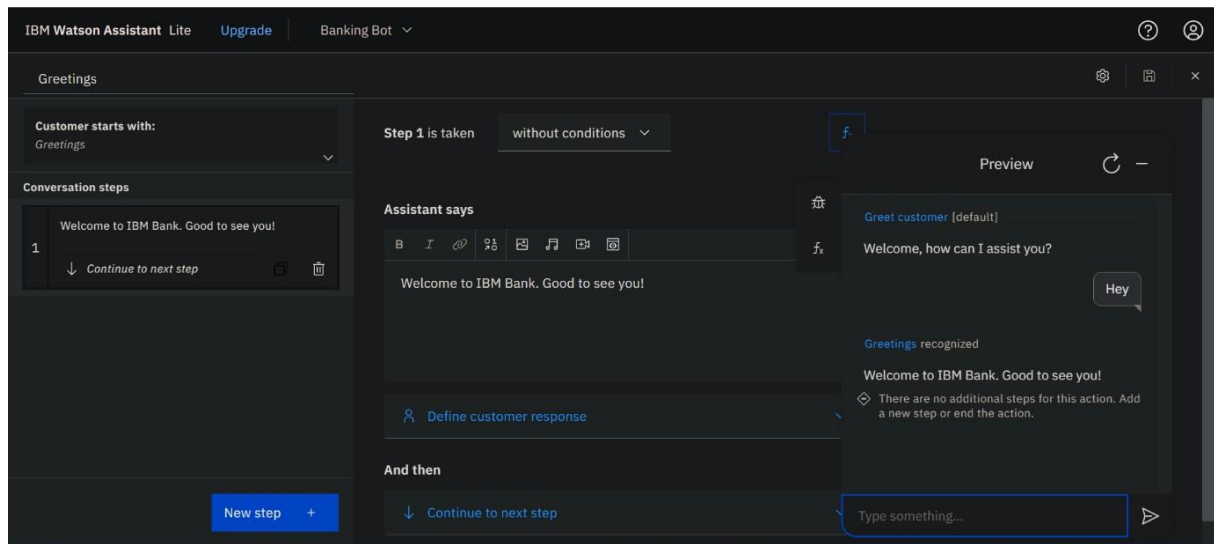
padding-right: 27px;
}
.u-section-1 .u-shape-1
{margin-top: 296px;
}
.u-section-1 .u-image-1
{margin-top: -249px;
}
}
@media (max-width: 991px) {
.u-section-1 .u-layout-wrap-1 {
width: calc(((100% - 720px) / 2) + 720px);
}
.u-section-1 .u-layout-cell-1
{min-height: 100px;
}
.u-section-1 .u-text-1
{font-size: 3rem;
}
.u-section-1 .u-layout-cell-2
{min-height: 525px;
}
.u-section-1 .u-shape-1
{margin-top: 285px;
}
.u-section-1 .u-image-1
{width: 319px;
height: 319px;
margin-top: -238px;
}
}
@media (max-width: 767px) {
.u-section-1 .u-layout-wrap-1 {
width: calc(((100% - 540px) / 2) + 540px);
}
.u-section-1 .u-container-layout-1
{padding-top: 50px;
padding-right: 60px;
padding-left: 10px;
}
.u-section-1 .u-text-1
{font-size: 3.75rem;
}
.u-section-1 .u-layout-cell-2
{min-height: 663px;
}
}

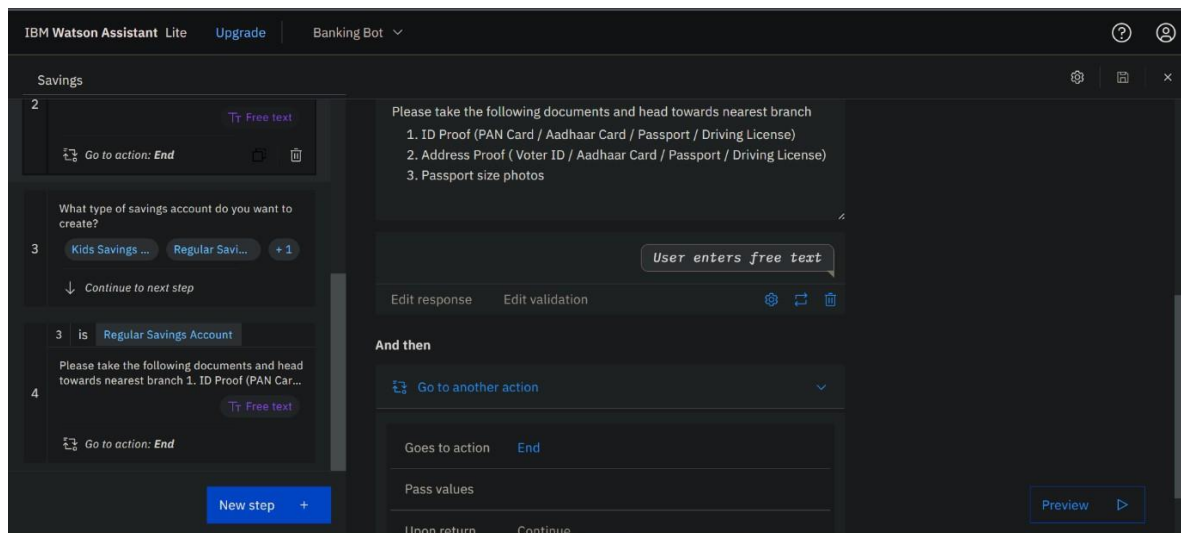
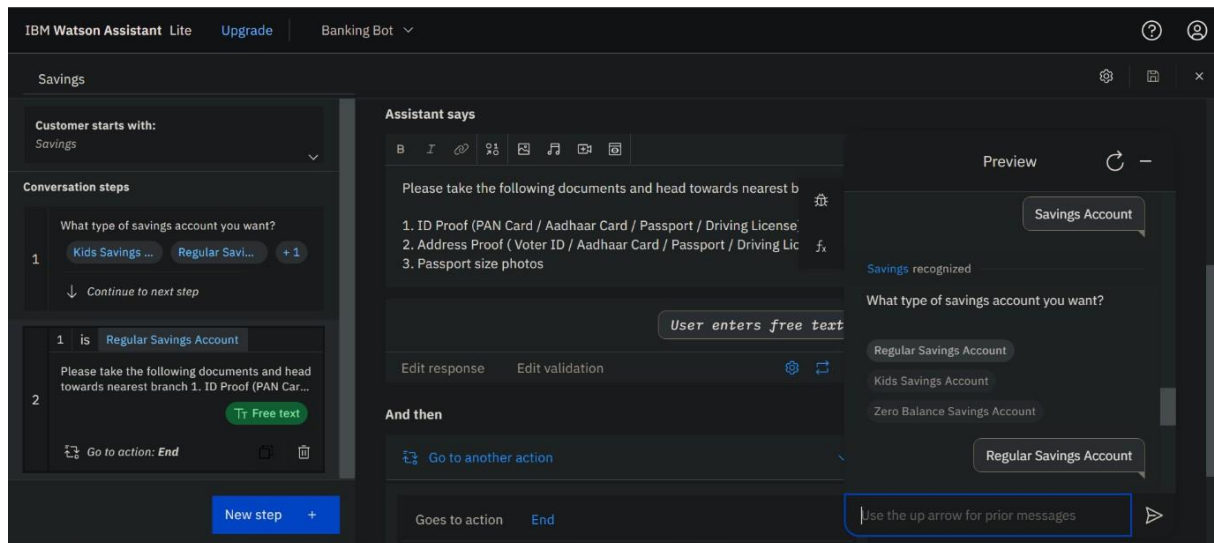
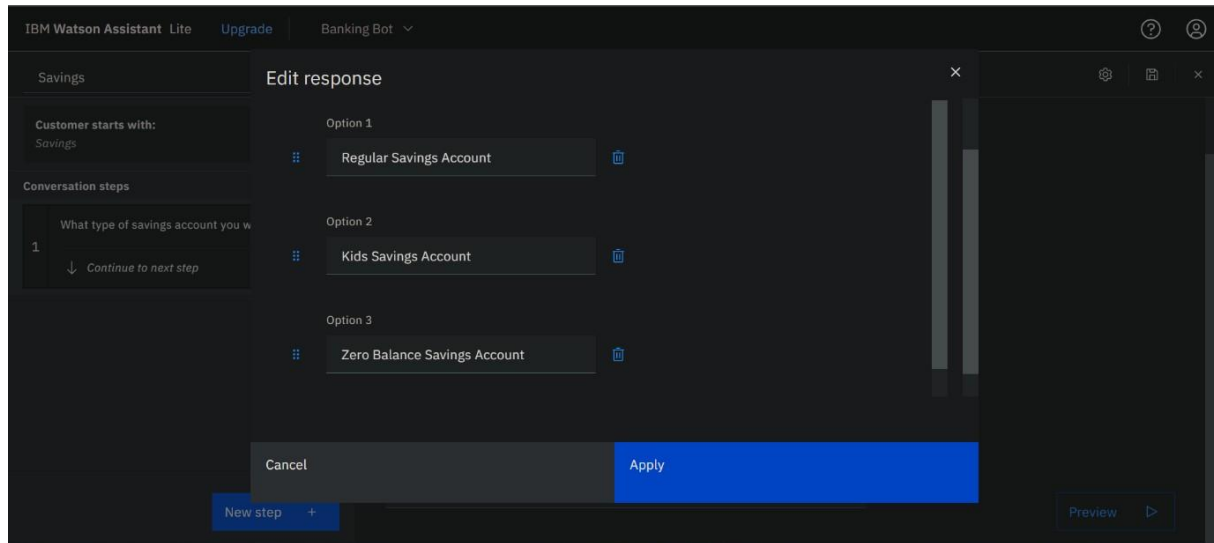
```

```
.u-section-1 .u-container-layout-2
{padding-left: 10px;
padding-right: 10px;
}
}
@media (max-width: 575px) {
.u-section-1 {
min-height: 907px;
}
.u-section-1 .u-layout-wrap-1
{width: 390px;
margin-right: auto;
}
.u-section-1 .u-container-layout-1
{padding-right: 50px;
}
.u-section-1 .u-text-1
{font-size: 3rem;
}
.u-section-1 .u-layout-cell-2
{min-height: 417px;
}
}
```

IBM CHATBOT:







BANKING INDUSTRY

BE SAFE, BE SECURE



Account



General Queries



Card Services



Net Banking

Hey! My name is Steve. How may I assist you today?

Guide to Create an Account

General Queries

Card Services

Net Banking

Loan

Type something...



Built with **IBM Watson®** ⓘ

BANKING INDUSTRY

BE SAFE, BE SECURE



Account



General Queries



Card Services



Net Banking



Banking Bot

General Queries

Select any of the **General Queries** given below.

Bank Working Days

Bank Working Days

With the exception of two Saturdays, the bank is open from **9 a.m. to 5 p.m.**, Monday through Saturday.



Type something...

Built with IBM Watson®

BANKING INDUSTRY

BE SAFE, BE SECURE



Account



General Queries



Card Services



Net Banking

A small house icon representing a home button.

Banking Bot

A small 'x' icon in a square box used to close the suggestions panel.

A small question mark icon.

Suggestions

View related content

A small microphone icon.

I couldn't find anything to share with you that's related to the current conversation.

Get help another way

Connect to agent

A small icon of two people, representing a live agent.

People are also interested in

Guide to Create an Account

General Queries

Card Services

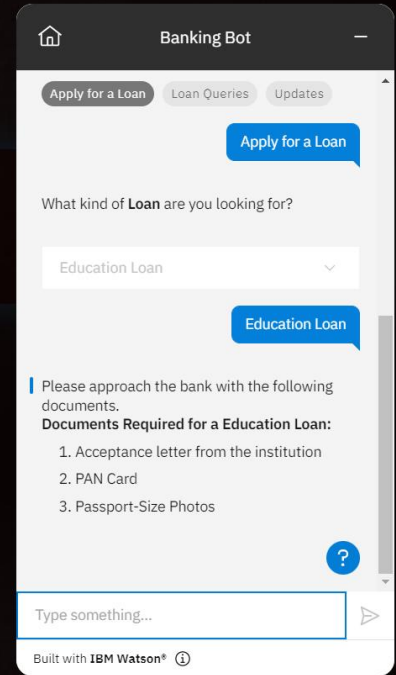
Net Banking

Loan

Built with IBM Watson® A small circular icon with an 'i' inside, representing an information or help link.

BANKING INDUSTRY

BE SAFE, BE SECURE



GITHUB LINK:

<https://github.com/IBM-EPBL/IBM-Project-33861-1660228024>

PROJECT DEMO LINK:

<https://drive.google.com/file/d/1gocqC9TNCBPCBHcaiLvPtTS3-WoUXcc6/view?usp=sharing>