

# **PROJECT REPORT**

## **AI BASED DISCOURSE FOR BANKING INDUSTRY**

**Team ID:** PNT2022TMID07052

**Batch:** B9-3A5E

### **TEAM LEADER:**

**Name:** DINESH R

**Register Number:** 130719104019

### **TEAM MEMBERS:**

**Name:** ASWIN T

**Register Number:** 130719104010

**Name:** DURAI RAJ C

**Register Number:** 130719104022

**Name:** GIRISH C

**Register Number:** 130719104027

**Name:** GOPIKRISHNAN A

**Register Number:** 130719104029

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# **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

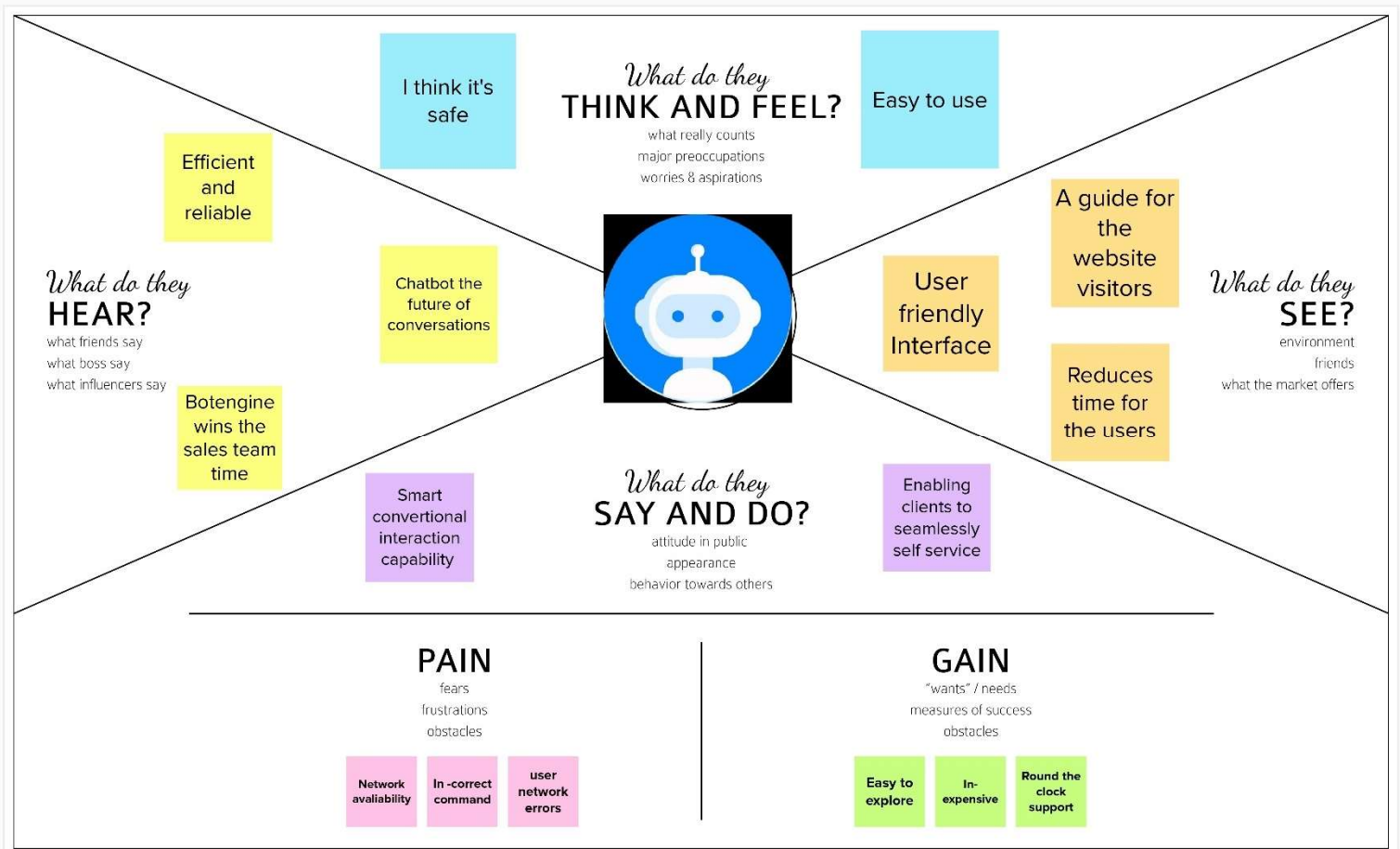
Edit this template  
Right-click to unlock

# Empathy Map Canvas

Gain insight and understanding on solving customer problems.

1

Build empathy and keep your focus on the user by putting yourself in their shoes.





## 3.2 Ideation & Brainstorming



### 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

💬 Share template feedback



#### Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

🕒 10 minutes



##### Team gathering

Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.



##### Set the goal

Think about the problem you'll be focusing on solving in the brainstorming session.



##### Learn how to use the facilitation tools

Use the Facilitation Superpowers to run a happy and productive session.

Open article →

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

The aim of our project is to build a chatbot using IBM Watson's assistant. This chatbot should be able to answer any general banking queries on account creation, loan, net banking, etc. The chatbot should provide 24/7 customer support with all the necessary data for solving their queries which reduces their time on moving to banks directly.



##### Key rules of brainstorming

To run a 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!

### Gopikrishnan A

It is trustworthy

It is used to retrieve customer's old transaction history quickly

It can be used from anywhere

It provides instant solution for general banking queries

### Dinesh R

It supports voice assistance feature

It has an assured security and provides personalized service

It works in a very fast and intelligent manner

It can eliminate long queues

### Ashwin T

It provides quick responses for loan related queries

It is multilingual

It facilitates constant guidance to customers on creating bank accounts

It maintains a confidential conversation with customers

### Girish C

It maintains a user friendly interface

It is available 24/7

It has no waiting time

It saves user's time and cost

### Durai Raj C

It provide quick responses

It provides reliable service on answering net banking queries

It is interoperable

It provides efficient and convenient customer support

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

### Using Artificial intelligence

It is trustworthy

It supports voice assistance feature

It provides quick responses for loan related queries

It provide quick responses

It maintains a user friendly interface

### Using Cloud Technology

It is used to retrieve customer's old transaction history quickly

It is multilingual

It has an assured security and provides personalized service

It provides reliable service on answering net banking queries

It is available 24/7

### Using Neural Network

It can be used from anywhere

It is interoperable

It facilitates constant guidance to customers on creating bank accounts

It has no waiting time

It works in a very fast and intelligent manner

### Using Natural Language Processing

It maintains a confidential conversation with customers

It provides instant solution for general banking queries

It can eliminate long queues

It saves user's time and cost

It provides efficient and convenient customer support

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

→

**After you collaborate**

You can export the mural as an image or pdf to share with members of your company who might find it helpful.

**Quick add-ons**

A

**Share the mural**

Share a view link to the mural with stakeholders to keep them in the loop about the outcomes of the session.

B

**Export the mural**

Export a copy of the mural as a PNG or PDF to attach to emails, include in slides, or save in your drive.

**Keep moving forward**

**Strategy blueprint**

Define the components of a new idea or strategy.

Open the template →

**Customer experience journey map**

Understand customer needs, motivations, and obstacles for an experience.

Open the template →

**Strengths, weaknesses, opportunities & threats**

Identify strengths, weaknesses, opportunities, and threats (SWOT) to develop a plan.

Open the template →

**Share template feedback**

### 3.3 Proposed Solution

## AI BASED DISCOURSE FOR BANKING INDUSTRY-PROPOSED SOLUTION

### PROBLEM STATEMENT :

- Bank cannot provide 24X7 support for the customers.
- Difficult to manage the time.
- Bank employees cannot provide instant responses and quick answers.

### IDEA/SOLUTION DESCRIPTION :

- Chat-bots must be able to provide 24X7 support that caters to the needs of customers at all times.
- Users can interact with chat-bots to get to know the best bank offers.

- Chat-bots in banking industries can help customers with issues that can be non-complex but urgent.

#### **UNIQUENESS :**

- Application uses IBM Watson chat-bots as an interactive service.
- Having a help-line 24/7 is not needed while we have AI powered chat-bots.
- With the help of chat-bots we provide an interactive service to customers.
- At the end of the day, customer's feedback about the application is necessary.

## SOCIAL IMPACT/ CUSTOMER SATISFACTION:

- Bank have implemented chat-bots on their websites to provide support to their visitors on a 24/7 basis.
- The new customer wants to spend less and less time and therefore expects to reach a bank anytime and anywhere, regardless of time, location, and channel.
- A connection between chat-bots and customer loyalty is very likely. Besides, some customers suffer from the privacy paradox because of personalization
- Banks often use chat-bots in marketing activities, sales, and customer relationship management.

## **BUSINESS MODEL :**

- As we are dealing with customers need, Implementing this will increase the trust among the people.
- Feedback provides an opportunity to build a 2-way communication channel with your customers.
- With the amount of customers increase, during the growth of the application. We can provide premium features to the user with advanced options.

## **SCALABILITY OF SOLUTION :**

- As discussed in business model, as users grow we can implement premium functionality to the customers.
- Since we are using Docker to containerize the application and Kubernetes to orchestrate. It will be easier for the developers to scale the application.
- Users can provide with a feedback mechanism where they can voice their opinions and concerns.
- This will enable the app developers to understand which features should be retained, which current features need to be fixed and which features should be prioritised in future app releases.

### 3.4 Problem Solution fit

Project Title: AI based discourse for Banking Industry

Project Design Phase-I - Solution Fit

Team ID: PNT2022TMID07052

Define CS, fit into CC

#### 1. CUSTOMER SEGMENT(S)

- Bank account holders

#### 6. CUSTOMER CONSTRAINTS

- Good Internet connectivity
- Basic knowledge of using mobile or PC
- User should be able to understand English
- The probability of occurrence of clerical errors while typing is high
- The user should be able to covert his doubts into queries understandable to chat bot

#### 5. AVAILABLE SOLUTIONS

- EVA: For customers of HDFC Bank, EVA (Electronic Virtual Assistant) is an AI-powered banking assistant. EVA offers assistance with loan and interest rate info., branch addresses, IFSC codes, & other things.
- KEYA: Kotak Mahindra Bank's banking assistant. It is integrated with Kotak's phone-banking help line, & therefore it has augmented the traditional interactive voice response (IVR) system.

Explore AS, differentiate

Focus on J&P, tap into BE, understand RC

#### 2. JOBS-TO-BE-DONE / PROBLEMS

J&P

- Customers need to have the basic knowledge of using Computer
- Customers of different native language must have basic knowledge of English
- Customers need to have good Internet connection for faster response

#### 9. PROBLEM ROOT CAUSE

RC

Conversational Banking is a smarter way to retain loyal customers by offering a quick response to their queries. But the problem is to train the employees to get absolute knowledge to answer every query and having good skills of handling customers. Even if there is an employee with knowledge & soft skills answering queries may affect their productive time. Moreover the employees can't provide 24\*7 secure, reliable and personalized service.

#### 7. BEHAVIOUR

BE

- The customers have to type the query to the chatbot.
- The customers need to login to the website for getting personalized service.
- The customers of the bank may need to submit some forms, certificates in the bank.

Focus on J&P, tap into BE, understand RC

Identify strong TR & EM

#### 3. TRIGGERS

TR

- Most of the customers of the bank has lots of question but may hesitate to ask the employee
- Its an overhead to appoint a staff to address queries
- For simple queries the users need not to go to bank

#### 4. EMOTIONS: BEFORE / AFTER

EM

- Clueless > Aware  
e.g. : The new user may not have idea about creation of bank account and its pros and cons. Thus the chat bot helps to understand and guide him in creation process
- Dubious > Decisive  
e.g. : The user may have lot of queries about loan, insurance etc. The chat bot address the queries and make their doubt clarified

#### 10. YOUR SOLUTION

SL

The solution that we have designed it to develop an chat bot that utilizes the AI of IBM watsonassistant to provide a better & user friendly chat botthat could address

- General and net banking query
- Loan and Insurance query
- Guidance for account creation

The chat bot is supposed to be integrated with a flask web page which is the official web site of that bank.

#### 8. CHANNELS of BEHAVIOUR

CH

##### 8.1 ONLINE

- The customers have to login and use the web site for accessing the web page.

##### 8.2 OFFLINE

- The customers may be asked to submit some forms or certificates in the bank in-person for verification

Identify strong TR & EM

## 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"><li>• Type of Savings Account Creation Details</li><li>• Interest Rate</li><li>• Minimum Balance</li><li>• Debit Card</li><li>• Credit Card</li></ul>
FR-2	Current Account Related Actions	<ul style="list-style-type: none"><li>• Type of Company</li><li>• Current Account Closure Steps</li><li>• Update GSTIN</li><li>• Zero Balance Current Account</li></ul>
FR-3	Loan Account Related Actions	<ul style="list-style-type: none"><li>• Type of Loan</li><li>• How long for approval</li><li>• Available Loan Amounts</li><li>• Loan Status</li><li>• Joint Loan</li></ul>
FR-4	General Queries Related Actions	<ul style="list-style-type: none"><li>• Bank Working Days</li><li>• List of Branches</li><li>• Storage Locker Facility</li><li>• Currency Conversion Facility</li><li>• CIBIL</li><li>• Find a nearest branch</li></ul>
FR-5	Net Banking Related Actions	<ul style="list-style-type: none"><li>• Login Steps</li><li>• Change Net Banking Password</li><li>• Daily Limit</li><li>• Types of Fund Transfer</li><li>• Add Beneficiary</li></ul>

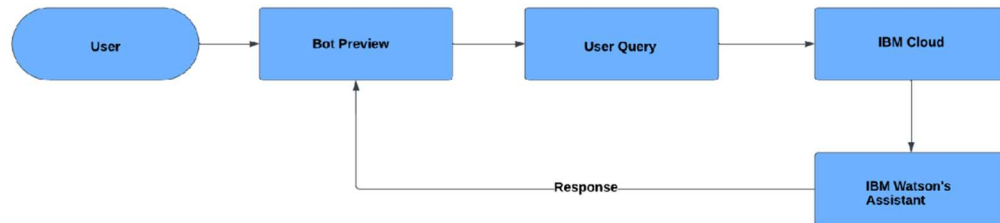


## 4.2 Non-Functional requirements

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.

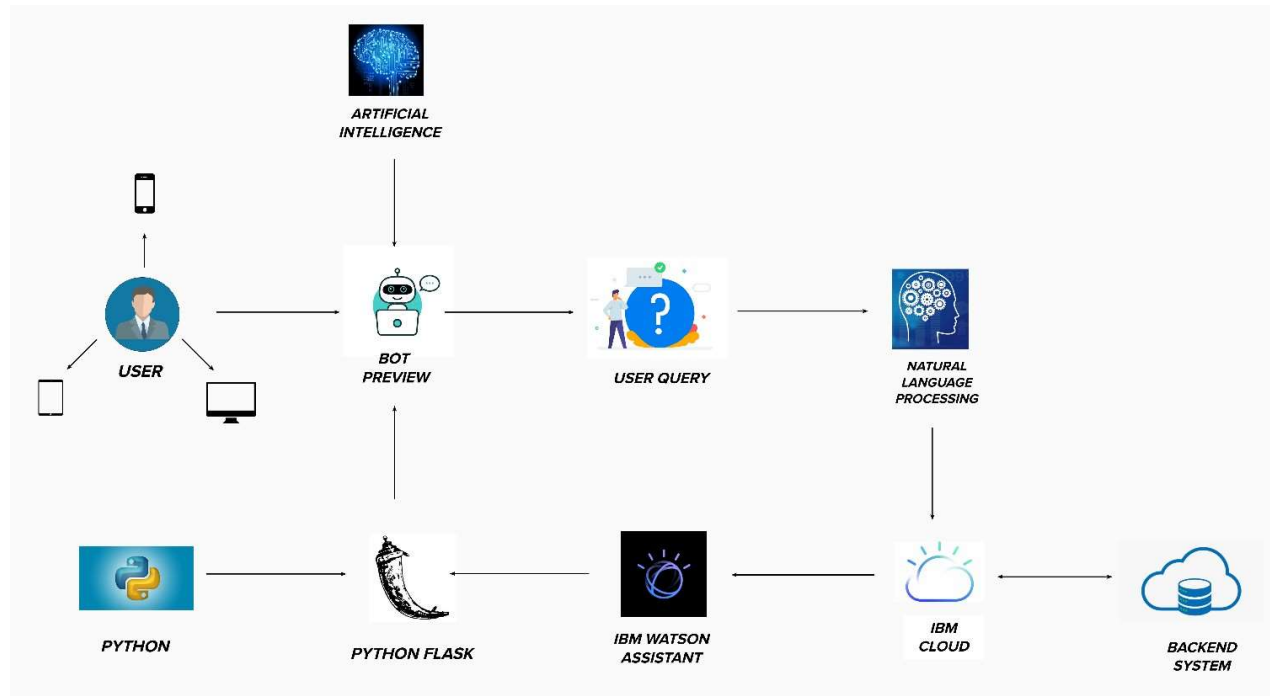
## 5. PROJECT DESIGN

### 5.1 Data Flow Diagrams

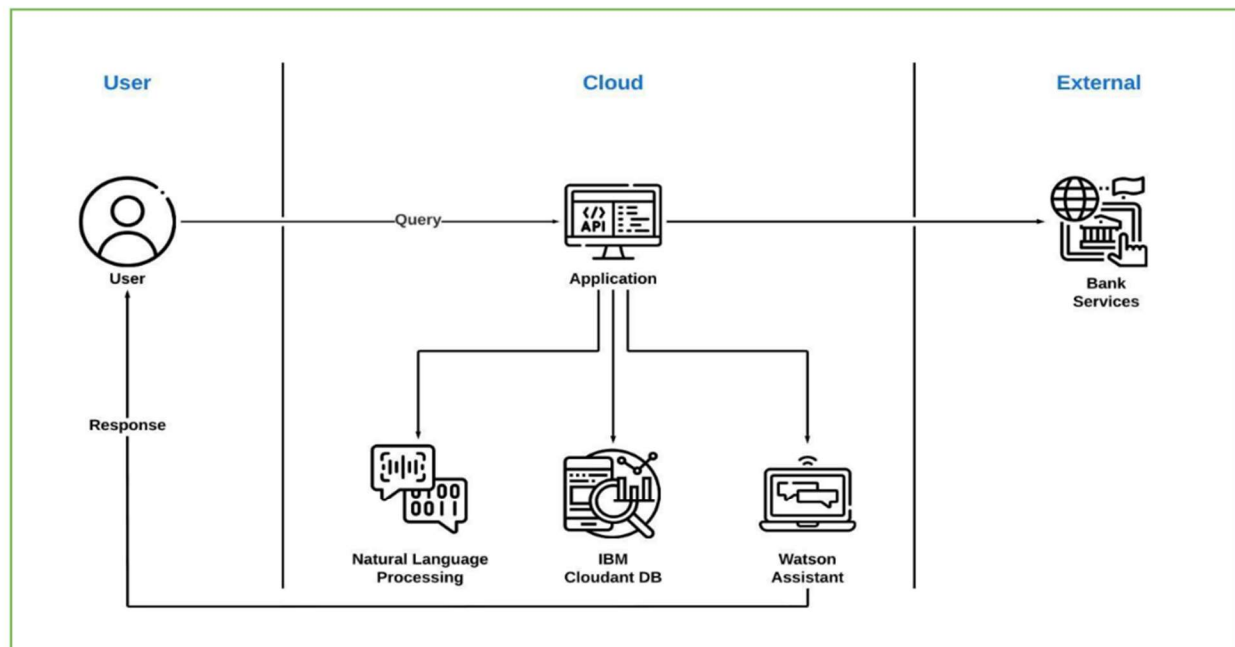


## 5.2 Solution & Technical Architecture

### Solution Architecture



### Technical Architecture



## 5.3 User Stories

### User Stories

Use the below template to list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile/Web user)	Bot Preview	USN-1	As a user, I can see the chatbot preview to ask inquiries, which includes a message box where I can type queries.	I can access the chatbot's message box.	High	Sprint-1
		USN-2	As a user, I can view the Frequently Asked Questions (FAQ).	I get access to the Frequently Asked Questions (FAQ).	High	Sprint-1
	Updates	USN-3	As a user, I can see the updates and search for further information about them.	I can able to view and access the updates.	Medium	Sprint-2
Administrator	Edit Options	USN-4	As an admin, I can add / edit greeting messages, FAQs to the Bot.	I can access to add options like greeting messages, etc.	High	Sprint-1
		USN-5	As an admin, I have the authority to provide ideas and alternatives to the Bot.	I can deliver ideas and alternatives.	Medium	Sprint-2
		USN-6	As an admin, I can make a post regarding new updates.	I can post new updates.	Medium	Sprint-2
Developer	Support	USN-7	As a developer, I can implement Bot for bank conveniently using IBM Watson Assistant.	I can easily accessible Watson Assistant.	High	Sprint-1
	Upcoming Features	USN-8	As a developer, I can implement new features for the Bot.	I can able to perform new features to the bot.	Medium	Sprint-2
	Design	USN-9	As a developer, I can create as well as design the chatbot's UI.	I can design the chatbot's UI.	High	Sprint-1

## 6. PROJECT PLANNING AND SCHEDULING

### 6.1 SPRINT PLANNING AND 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	Girish, Durai Raj
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	Aswin, Gopi Krishnan
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	Dinesh, Durai Raj
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	Dinesh, Durai Raj
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	Aswin, Gopi Krishnan

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	Aswin, Gopi Krishnan
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	Girish, Gopi Krishnan
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	Dinesh, Aswin
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	Aswin, Gopi Krishnan
Sprint-4		USN-10	Improving the model efficiency whenever needed/As a user, I can see new updated chatbot in Future days.	5	Moderate	Dinesh, Durai Raj

## 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-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

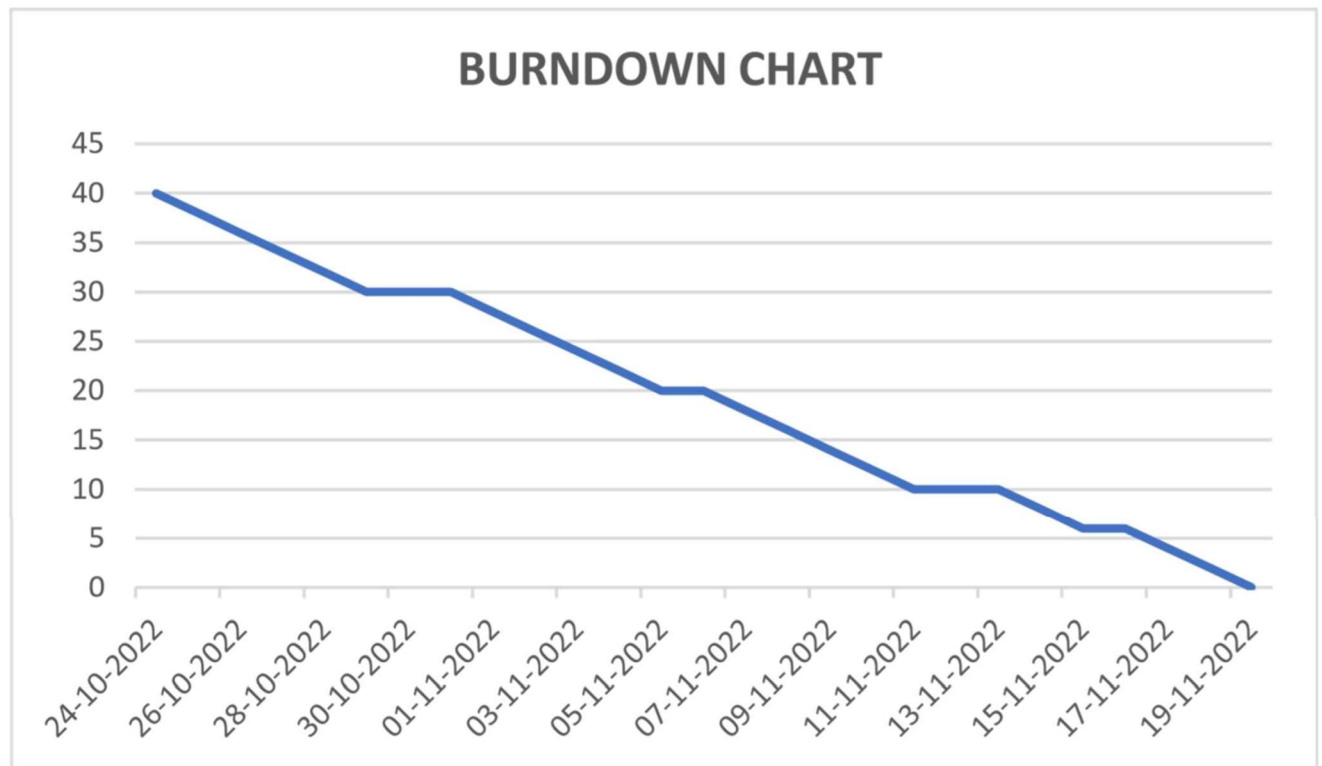
### Velocity:

The team's average velocity (AV) per iteration unit (story points per day)

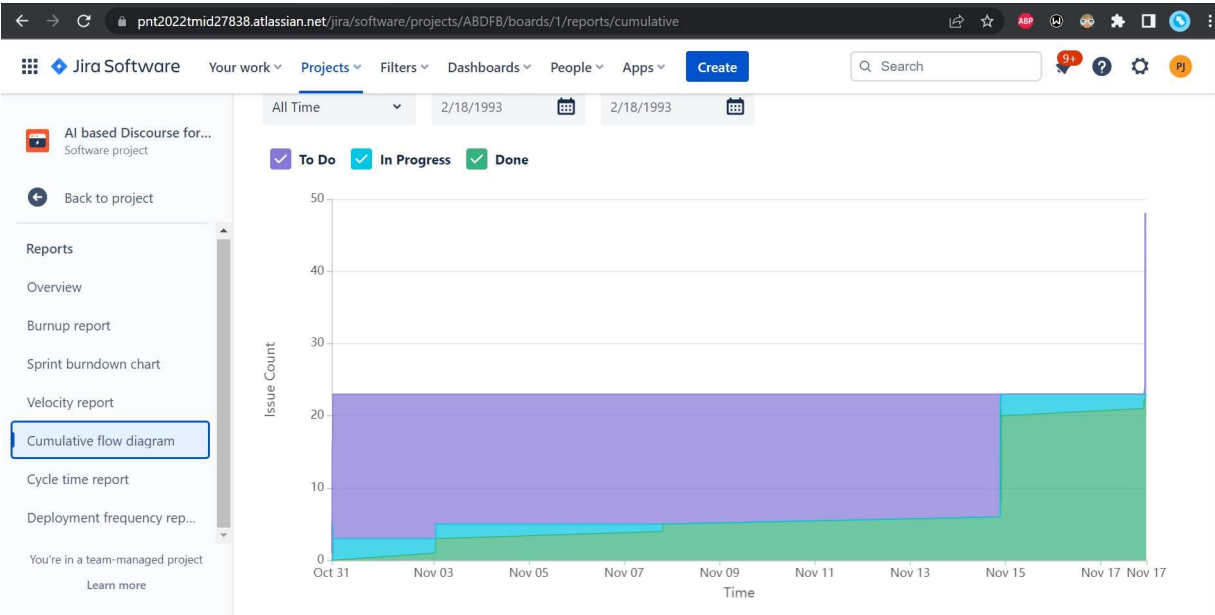
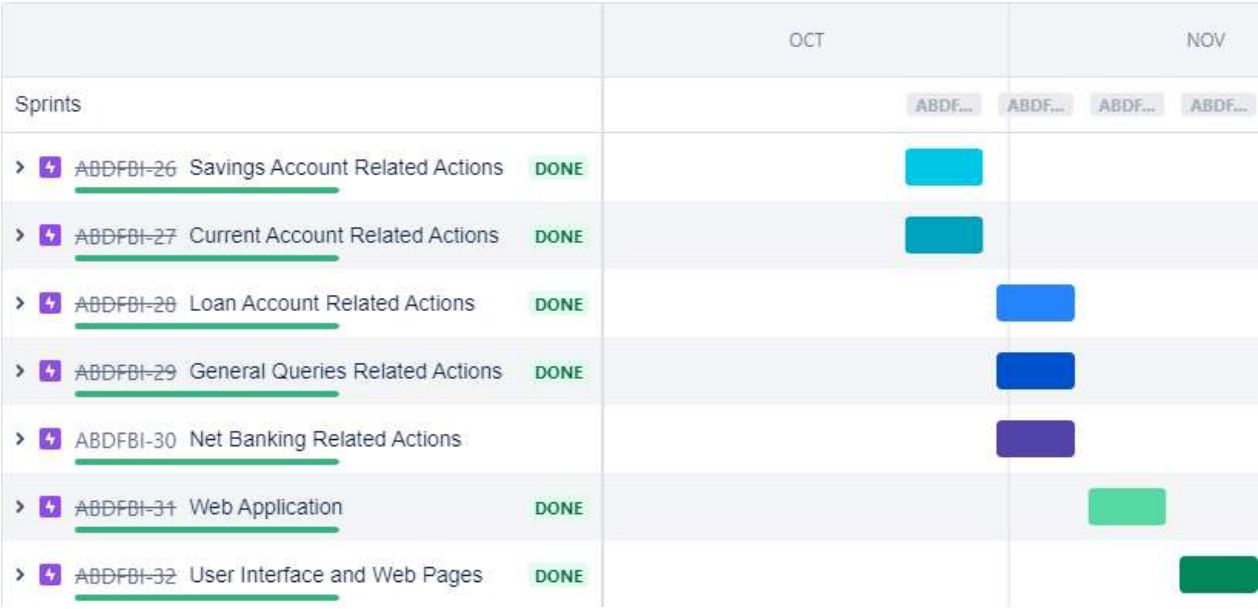
$$AV = 20/6 = 3.33$$

## Burndown Chart:

A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.



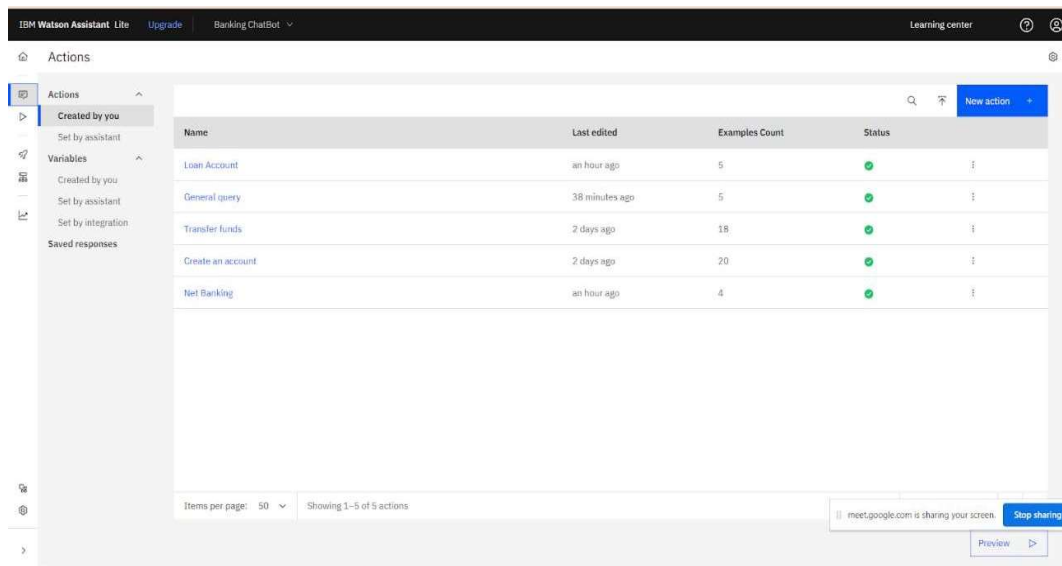
### 6.3 Reports from JIRA





## 7.CODING & SOLUTIONING

### 7.1 Feature 1

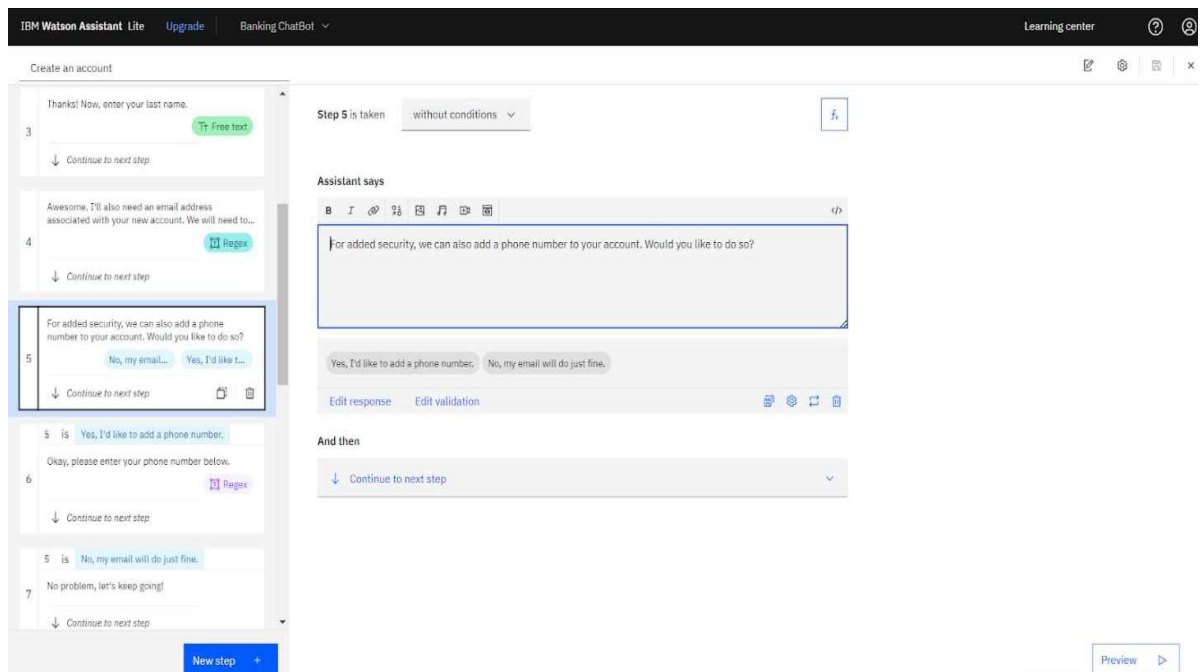


The screenshot shows the 'Actions' page in the IBM Watson Assistant interface. The left sidebar contains navigation options: 'Actions' (selected), 'Created by you', 'Set by assistant', 'Variables', 'Created by you', 'Set by assistant', 'Set by integration', and 'Saved responses'. The main area displays a table of actions.

Name	Last edited	Examples Count	Status
Loan Account	an hour ago	5	✓
General query	38 minutes ago	5	✓
Transfer funds	2 days ago	18	✓
Create an account	2 days ago	20	✓
Net Banking	an hour ago	4	✓

At the bottom of the table, it says 'Items per page: 50' and 'Showing 1-5 of 5 actions'. There is a 'New action +' button in the top right corner and a 'Preview' button at the bottom right.

### 7.2 Feature 2



The screenshot shows the 'Create an account' flow in the IBM Watson Assistant interface. The flow consists of several steps, with Step 5 highlighted. The flow is as follows:

- Step 3: Thank! Now, enter your last name. (Free text)
- Step 4: Awesome. I'll also need an email address associated with your new account. We will need to... (Regex)
- Step 5: For added security, we can also add a phone number to your account. Would you like to do so? (No, my email... Yes, I'd like to...)
- Step 6: Okay, please enter your phone number below. (Regex)
- Step 7: No problem, let's keep going!

Step 5 is taken without conditions. The assistant says: 'For added security, we can also add a phone number to your account. Would you like to do so?'. The user can respond with 'Yes, I'd like to add a phone number.' or 'No, my email will do just fine.'. The flow continues to Step 6 if the user chooses to add a phone number.

## 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 User Acceptance Testing

#### UAT Execution & Report Submission

##### a) 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).

##### b) Defect Analysis

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	1	0	0	0	1
Duplicate	3	1	0	1	5
External	1	3	0	1	5
Fixed	2	5	3	2	12
Not Reproduced	0	0	0	1	1
Skipped	0	0	0	0	0
Won't Fix	0	0	0	0	0
Totals	7	9	3	5	24

## C) 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	1	0	0	1
Client Application	1	0	0	1
Security	1	0	0	1
Outsource Shipping	0	0	0	0
Exception Reporting	1	0	0	1
Final Report Output	1	0	0	1
Version Control	1	0	0	1

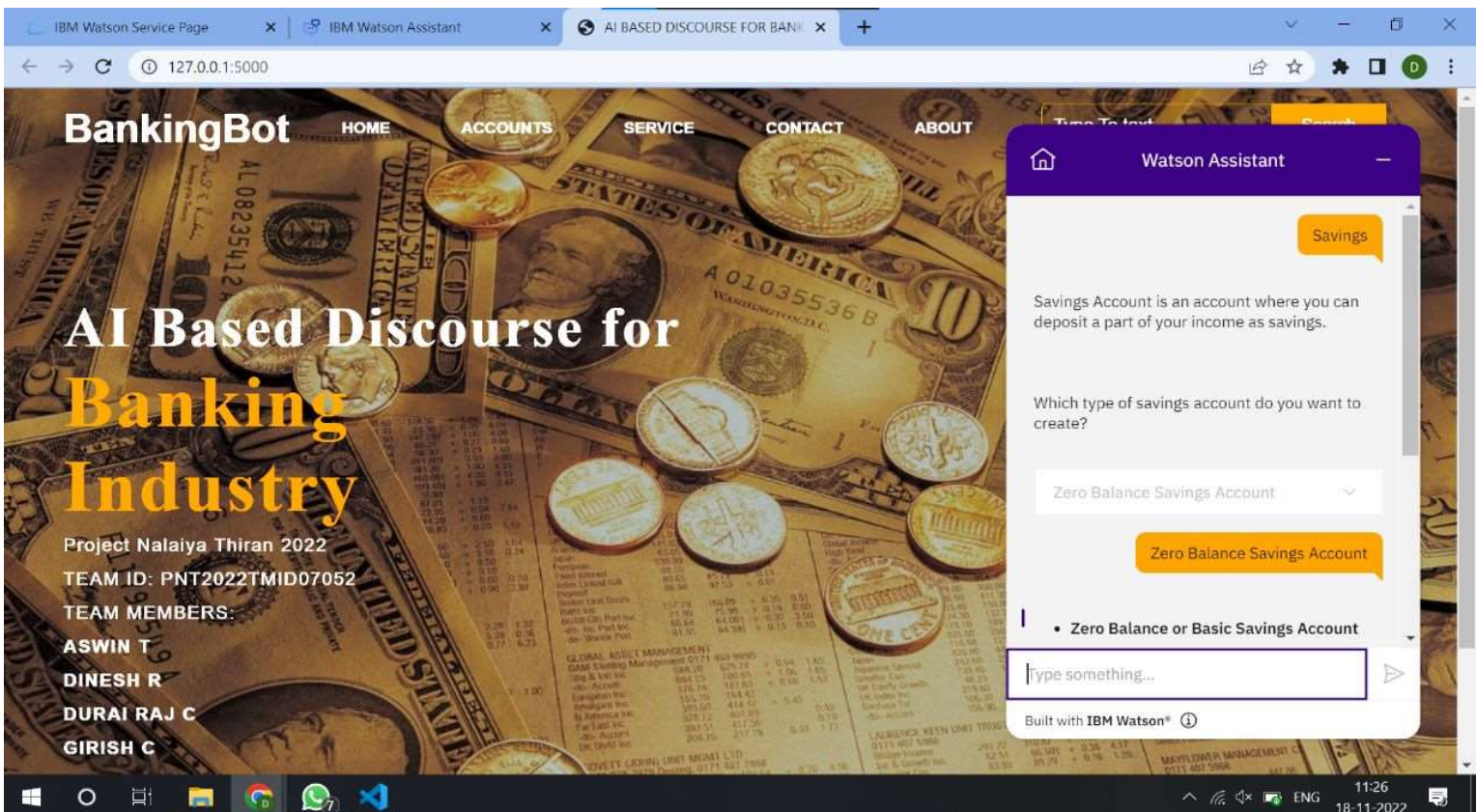
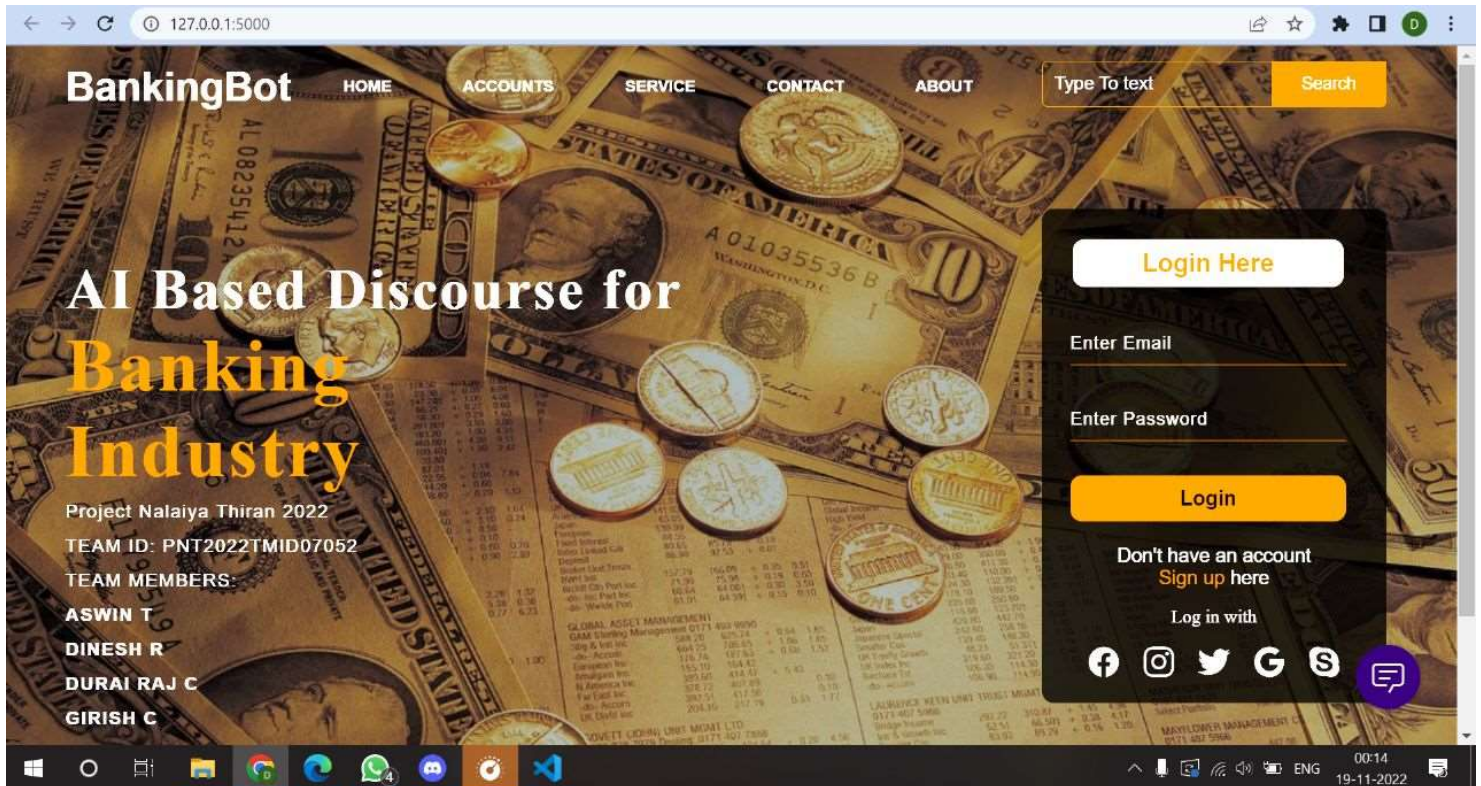
## 8.3 PERFORMANCE TESTING

Test Report				
Test Cycle	System Test			
EXECUTED	PASSED			130
	FAILED			0
	(Total) TESTS EXECUTED			130
	(PASSED + FAILED)			
PENDING				0
IN PROGRESS				0
BLOCKED				0
	(Sub-Total) TEST PLANNED			130
	(PENDING + IN PROGRESS + BLOCKED + TEST EXECUTED)			

Functions	Description	% TCs Executed	% TCs Passed	TCs pending	Priority	Remarks
New Customer	Check new Customer is created	100%	100%	0	High	
Edit Customer	Check Customer can be edited	100%	100%	0	High	
New Account	Check New account is added	100%	100%	0	High	
Edit Account	Check Account is edit	100%	100%	0	High	
Delete Account	Verify Account is delete	100%	100%	0	High	
Delete customer	Verify Customer is Deleted	100%	100%	0	High	
Mini Statement	Verify Ministatement is generated	100%	100%	0	High	
Customized Statement	Check Customized Statement is generated	100%	100%	0	High	



## 9. RESULT



## **10. ADVANTAGES And DISADVANTAGES**

### **ADVANTAGES**

1. Chatbots have 24/7 Availability: Chatbots can be available to solve customer problems 24/7 whether it is day or night! They don't need to sleep after all! This is much more difficult to achieve using human customer service as it would require rotating teams that would be more complicated to manage as well.
2. Chatbots can gather Customer Insights: Companies thrive on customer data! The more data they have, the better they can cater to their customers and be much more successful. That's where chatbots can be a big help. Whenever you interact with any chatbots on a company page, you provide basic data such as user preferences, buying habits, sentiments, etc. which can then be analysed to understand market trends, operational risks, etc. And using this information, the company can solve customer issues much easier and create targeted products. This will help in increasing their customer loyalty!

### **DISADVANTAGES**

1. Chatbots sound too Mechanical: Chatbots are not human and so obviously they cannot interact as a human with customers. They sound too mechanical and can only give answers to problems that they have been programmed with. They cannot answer a customer according to the context and they cannot show any emotions if needed. Chatbots also cannot maintain a natural-sounding conversation in-depth with customers and that is why they are only useful in solving basic queries. But this can create a disconnect with customers who prefer the human approach when solving their problems.
2. Chatbots can only handle basic Questions: Chatbot are still a basic Artificial Intelligence technology and so they can only answer the basic questions of customers and provide general information that is already available to them. They cannot solve complicated queries or answer out of script questions and companies need to have human customer service employees that can manage these for them. However, this is changing with time and currently, more and more advanced chatbots are entering the market.

## **11. CONCLUSION**

In this paper we have provided a survey of relevant works of literature on the subject, and we have analysed the state of the art in terms of language models, applications, datasets used, and evaluation frameworks. We have also underlined current challenges and limitations, as well as gaps in the literature. Despite technological advancements, AI chatbots are still unable to simulate human speech. This is due to a faulty approach to dialogue modeling and a lack of domain-specific data with open access. For Information Retrieval chatbots, there is also a lack of a learnt AI model. There is still a gap to be closed in terms of applications between Industry models and current advancements in the sector. Large models necessitate a lot of computing power and a lot of training data. There is no universal framework for evaluating chatbots. Several models depend on human evaluation, yet human evaluation is expensive, time-consuming, difficult to scale, biased, and lacks coherence. A new, reliable automatic evaluation approach should be provided to overcome these restrictions.

## **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 le

## **13.SOURCE CODE**

GITHUB: <https://github.com/IBM-EPBL/IBM-Project-25432-1659963405>

DEMO LINK: <https://drive.google.com/file/d/1cCjhem3FUgIjvLXiOQqwPEJ-oe1w6hA-/view>