



*Hindusthan College of Engineering And Technology*

Approved by AICTE, New Delhi, Accredited with 'A'  
Grade by NAAC (An Autonomous Institution, Affiliated  
to Anna University, Chennai) Valley Campus, Pollachi  
Highway, Coimbatore – 641 032



# **AI BASED DISCOURSE FOR BANKING INDUSTRY**

**NALAIYA THIRAN PROJECT BASED LEARNING**

**on**

**PROFESSIONAL READINESS FOR INNOVATION, EMPLOYABILITY AND  
ENTREPRENEURSHIP A PROJECT REPORT**

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**BACHELOR OF TECHNOLOGY IN INFORMATION TECHNOLOGY**

**HINDUSTHAN COLLEGE OF ENGINEERING AND TECHNOLOGY**

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(An Autonomous Institution, Affiliated to Anna University, Chennai)

**COIMBATORE – 641 032**

**November 2022**



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# 1.Introduction

## AI Based Discourse For Banking Industry

**Category: Artificial Intelligence**

**Skills Required:**

Python,NLP,IBM Cloud,IBM Watson Assistant,Deep Learning,Python-Flask

**Project Description:**

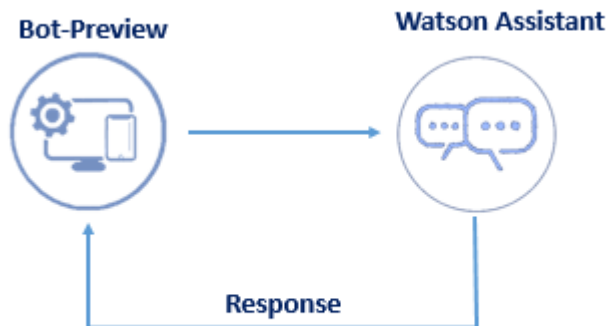
In this project, we will be building a chatbot using Watson's assistant. This chat should have the following capabilities:

- The Bot should be able to guide a customer to create a bank account.
- The Bot should be able to answer loan queries.
- The Bot should be able to answer general banking queries.
- The Bot should be able to answer queries regarding net banking.

**Services Used:**

- IBM Watson Assistan

**Technical Architecture:**

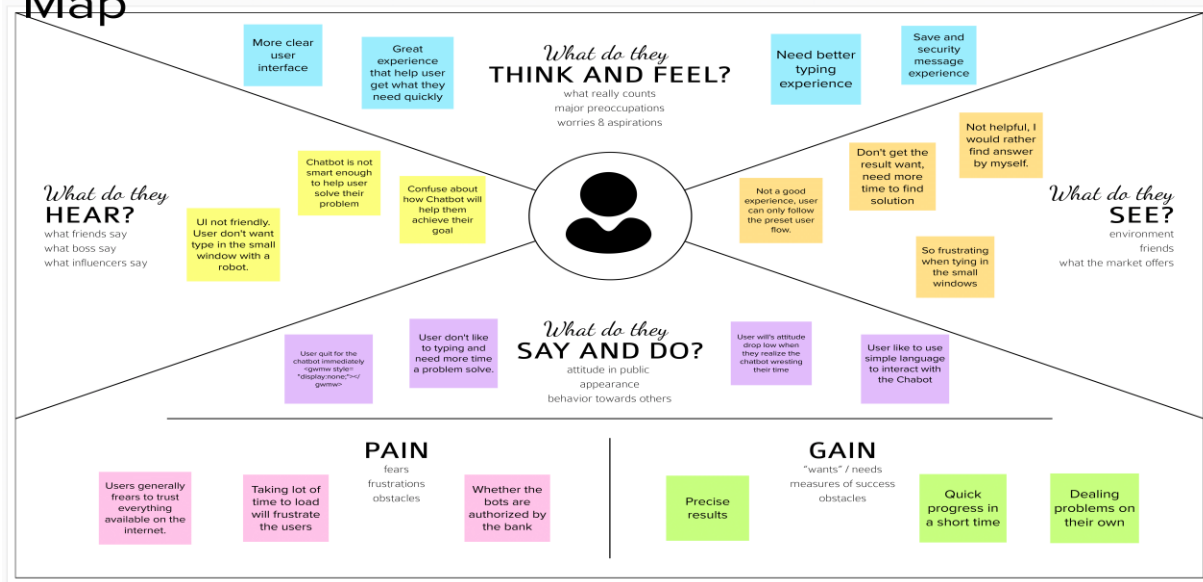


## 2.Ideation Phase

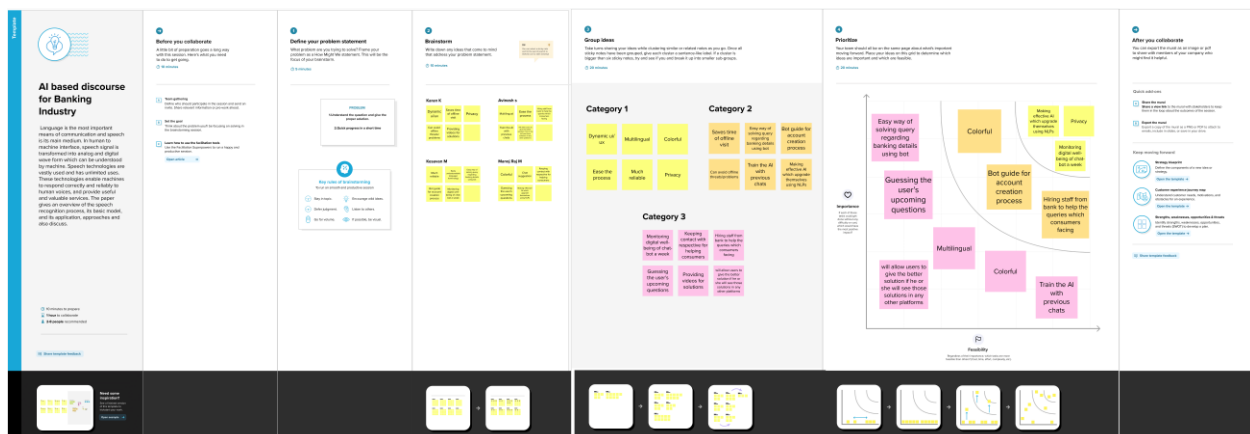
### 2.1 Empathy Map

## AI based discourse for Banking Industry

### Empathy Map



### 2.2 Brainstorming



## **2.3 Literature Survey:**

### **Existing Papers:**

#### **[1]. The Impact of Chat-Bots on the Banking Experience**

The Indian banking sector plays a crucial role in the economy of our country and is constantly evolving and innovating its services to enable and to serve its customers better and round the clock to the fullest of their capacity. One of the most revolutionizing step in this regard is the introduction and implantation of chatbots that is redefining the banking experience in many ways.

##### **Advantages:**

1. It assists the Banks Marketing Department.
2. It facilitates core Banking Activities.

##### **Disadvantages:**

1. Lacking in Multilingual.

#### **[2]. Banking Bot (B-Bot):**

In this paper we present a chatbot which is a banking Chatbot called B-BOT which resolves all the bank related queries. The chatbot's model can be divided into three sections – Backend, ML model and Frontend. The main functionality of the chatbot is carried out by Rasa Framework.

##### **Advantages:**

1. Use message passing technology for Interaction which gives a better understanding for AI.

##### **Disadvantages:**

2. Didn't have Speech Recognition.

#### **[3]. A Review of Chatbots in the Banking Sector**

Abstract—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.

##### **Advantages:**

1. To avoid involving navigating through a lot of pages to find the information you need.
2. A smart chatbot takes a query from the user in natural language and gives the appropriate response for the same.

**Disadvantages:**

1. Approach requires large amounts of training data and is difficult to train.
2. User initiated dialogues are error prone because users can say anything they want.

**[4]. A study of applications of Artificial Intelligence in banking and finance sector.**

Artificial Intelligence (AI) is reckless growing as the go-to technology for companies across the world to personalize experience for individuals. The technology itself is getting enhanced and smarter day-by-day, allowing more and newer industries to adopt the AI for various applications. Banking sector is becoming one of the first adopters of AI and just like other segments, banks are exploring and implementing the technology in various ways.

**Advantages:**

1. Help them track their financial activities.
2. AI in finance has automated processes and drastically reduced the cost of serving customers.

**Our Proposed system Advantages:**

**Multilingual:** Users can switch to their native language and interact with our chatbot.

**Dynamic UI:** Our chatbot will help to navigate to every position and explain what is what.

**Speech Recognition:** Users can give voice commands and request replies from our chatbot.

**Reference Papers:**

**[1]. The Impact of Chat-Bots on the Banking Experience** published at April 2021.

Author: Geeta Narula, Rakhi Narula.

**[2]. Banking Chatbot (B-Bot)**

Author: Dr. C. Punitha Devi, Dr. S. Geetha , N. Nagalakshmi , S. Karthiga, V. Suvedha.

Article History: Received: 10 January 2021; Revised: 12 February 2021; Accepted: 27 March 2021; Published online: 28 April 2021

**[3]. A Review of Chatbots in the Banking Sector** published at June 2021

Author: Shashank Bairy R, Rashmi R.

**[4]. A study of applications at Artificial Intelligence in Banking and Finance Sector** published at 32 May 2022.

Author: Dr. Lakshkaushik Dattatraya Puri.

## **2.4.Problem Statement:**

Banking is one the crucial sector, 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 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 needs 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 centres as well as providing them with relevant suggestions.

Who does the problem affect?	A customer of the bank
What are the boundaries of the problem?	Customers who have queries related to banking or trying to use various services of the bank
What is the issue?	Customers need to visit banks frequently for simple queries. Banks are not able to answer huge volumes of customers queries efficiently.
When does the issue occur?	When the customer is unable to visit a bank
Where does the issue occur?	It occurs in banking industries
Why is it important that we fix the problem?	It addresses the queries of customers immediately and effectively in a cost efficient manner.
What solution to solve this issue?	Chatbot should be able to answer any general banking queries on account creation, loan, net banking, other services etc. AI chatbots can help the customers to complete their work quickly and efficiently.



What methodology used to solve the issue?	Artificial intelligence mimics the human brain in order to make chatting with the chatbot more life- like.
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### Miro Customer Problem Statement Canvas:



Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	A student who just created a bank account	Understand more about the available features of the bank	I have to waste a lot of time at the bank	I have to ask a bank employee about my doubts	irritated
PS-2	A new customer	Learn more about banking	It takes a long time	There is always a long queue as bank employees are busy	frustrated
PS-3	An old customer at the bank	Find out my balance and check my statement	I have to travel to the bank now and then	I have to speak to a bank employee to get the work done	exhausted

### 3.1 Problem Solution Fit

## Problem-Solution fit canvas 2.0 Purpose/ Vision AI Based Discourse for Banking Industries

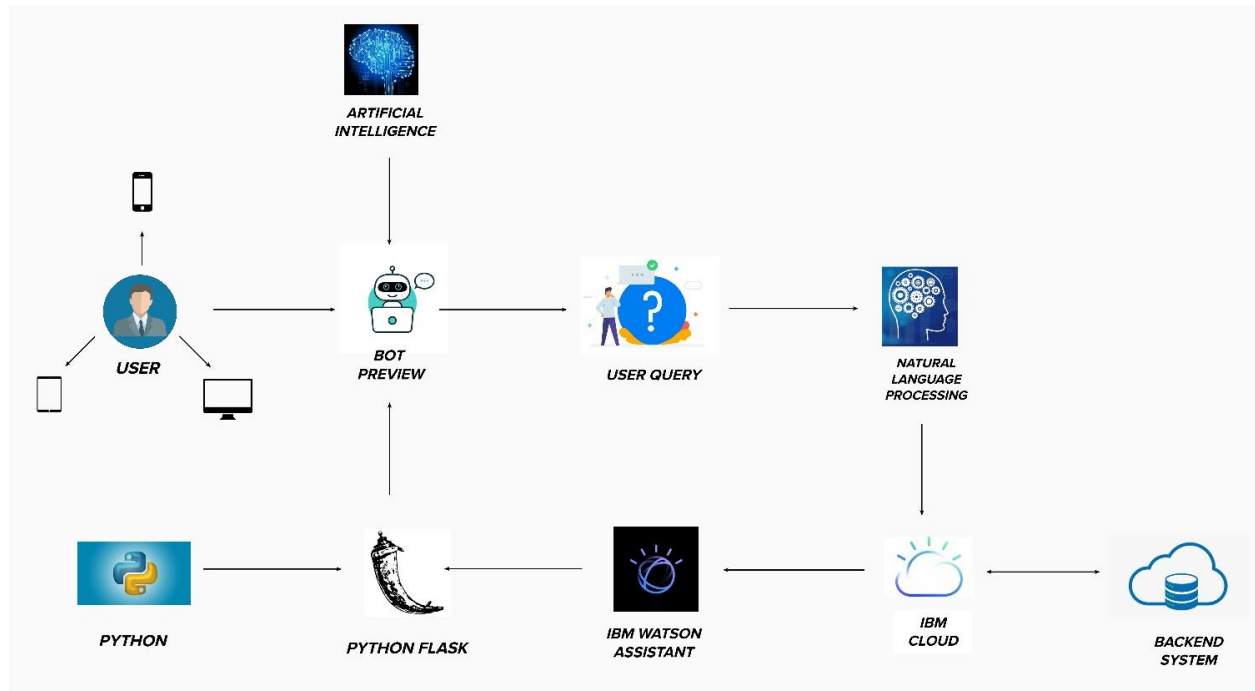
[illegible]

### 3.2 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 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.

## Solution Architecture:



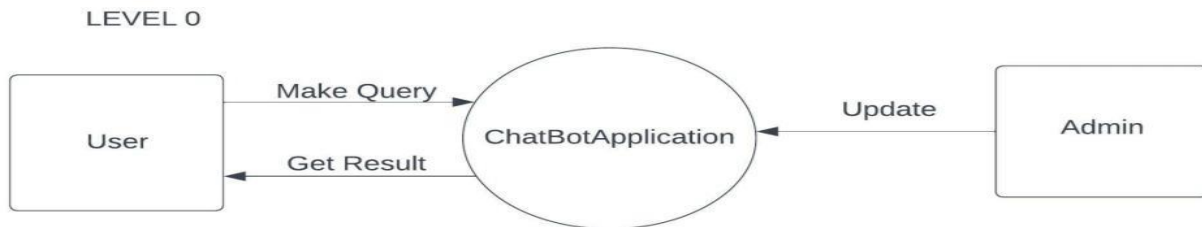
# AI based discourse on Banking Industry

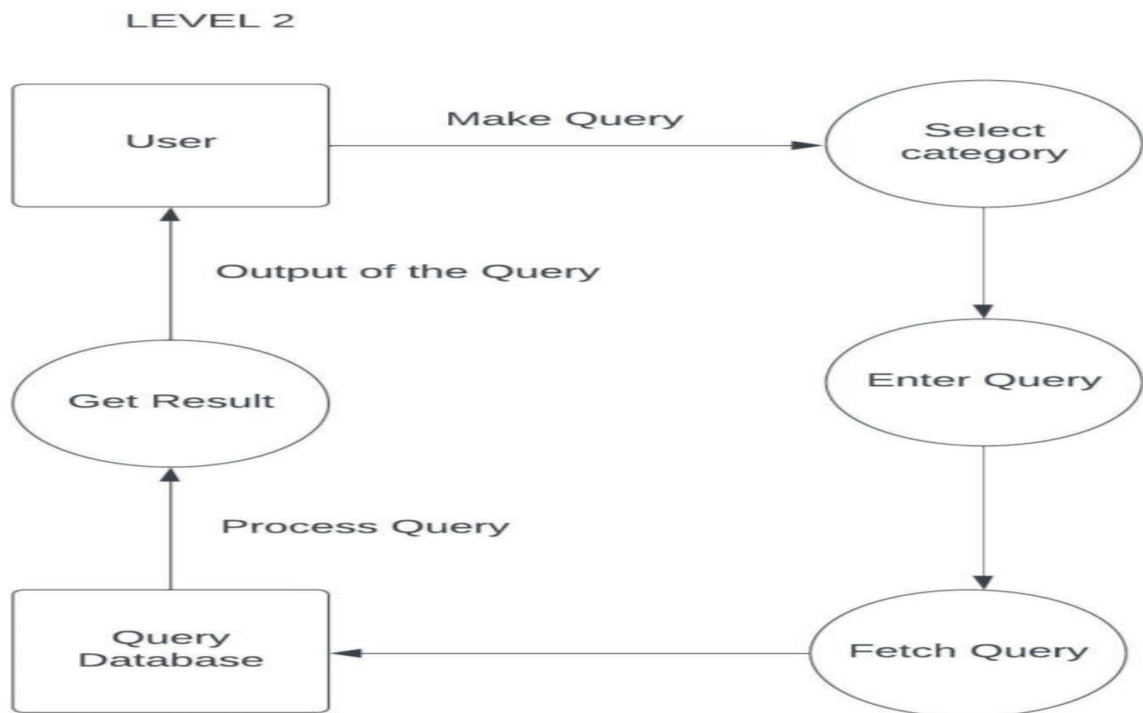
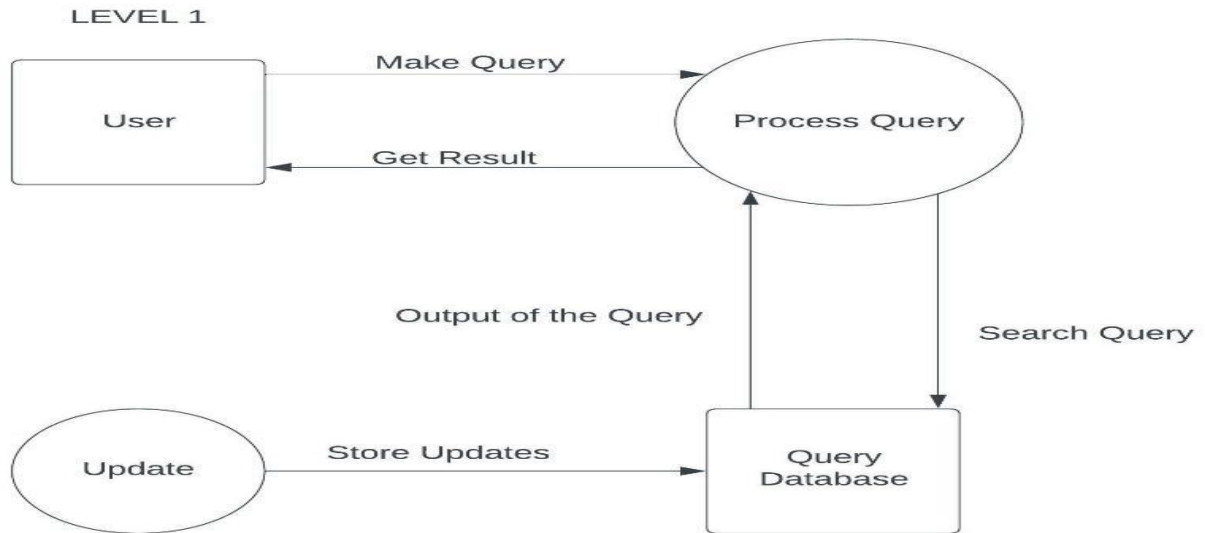
Team ID: PNT2022TMD10267

 <b>Entice</b> How does someone initially become aware of this process?	 <b>Enter</b> What do people experience as they begin the process?	 <b>Engage</b> In the core moments in the process, what happens?	 <b>Exit</b> What do people typically experience as the process finishes?	 <b>Extend</b> What happens after the experience is over?
<b>Steps</b> What does the person (or group) typically experience?	<b>Suggestions from bank</b> Chatbots provide quick replies for customer queries <b>Offers convenience</b> Reduces time for users to visit banks regularly	<b>Convenience</b> Customers find it easy to use chatbots at their convenience <b>Simple UI</b> Chatbots has a user friendly interface	<b>Interoperable</b> Chatbots are compatible on different platforms <b>Trustworthy</b> Chatbots ensure secure conversation with customers <b>Intelligent</b> Chatbots are well trained to make interaction with customers	<b>Reliability</b> Chatbots provide reliable information to customers <b>Accessibility</b> Chatbots are accessible at anytime and at anywhere easily <b>Scalable</b> Chatbots enhance customer satisfaction <b>Cost effective</b> Chatbots are easy to use with less of cost
<b>Interactions</b> What interactions do they have at each step along the way? • People: Who do they see or talk to? • Place: Where are they? • Things: What digital touchpoints or physical objects would they use?	<b>Customers should be able to type their queries easily</b> <b>Chatbots should be able to interpret the customer queries</b>	<b>Chatbots provide instant replies for customers to interact and they may choose options at their convenience</b> <b>Customers have information at their fingertips</b>	<b>Customers can able to get the instant replies from chatbots</b> <b>Chatbots provides voice based banking services</b> <b>Customers can make queries in their preferred languages</b>	<b>Customers can efficiently use chatbots as a variety of platforms</b> <b>Customers can get tasks done easily by chatbots</b> <b>Customers feel easier in interacting with chatbots to clear their queries</b> <b>Chatbots are efficient in satisfying customer needs</b>
<b>Goals &amp; motivations</b> At each step, what is a person's primary goal or motivation? ("Help me..." or "I help me avoid...")	<b>Chatbots should be able to provide correct information to customers</b> <b>Chatbots only provide relevant and correct information to customers</b>	<b>Customer does not need to wait to get their queries answered</b> <b>Human help and assistance is not required</b>	<b>Chatbots should be able to answer loan queries of customers</b> <b>Chatbots should be able to guide customers in creating bank account</b> <b>Chatbots should be able to answer net banking queries of customers</b>	<b>Chatbots should ensure personalized conversations with customers</b> <b>Chatbots should provide quick response for customer queries at any time</b> <b>Customers should be able to get good guidance on banking by chatbots</b> <b>Chatbots should enhance customer satisfaction</b>
<b>Positive moments</b> What steps does a typical person find enjoyable, productive, fun, motivating, delightful, or exciting?	<b>Customers enjoy convenience of getting queries clarified from bank</b> <b>Free to use</b>	<b>Chatbots address the customer queries immediately which makes them happier</b> <b>Chatbots can eliminate long queues as it is available anywhere which makes the customers satisfied</b>	<b>Chatbots has an user friendly interface so customers interact with it easily</b> <b>Chatbots provide instant responses for customer queries</b> <b>Customers feel happy in using chatbots as it has no waiting time</b>	<b>Customers feel secure in using chatbots at end</b> <b>Customers feel their workload gets reduced by using chatbots at end</b> <b>Customers need not be stressed on waiting to banks for simple queries as chatbots provide quick responses</b> <b>Chatbots make customers to have more on banking features which avoids them being frustrated</b>
<b>Negative moments</b> What steps does a typical person find frustrating, confusing, engaging, costly, or time-consuming?	<b>Not as comfortable as speaking to a human</b> <b>Requires internet</b>	<b>Certain amount of technical knowledge and skills required</b> <b>A greater probability of misinterpretations to occur</b>	<b>Chatbots can understand multiple languages at a time that makes customers angry</b> <b>Customers feel disappointed if chatbots provides unexpected answers</b> <b>Chatbots are not multilingual in more than one language</b>	<b>Customers are confused if chatbots doesn't provide reliable information</b> <b>Customers become annoyed at end if chatbots doesn't provide genuine interaction with them</b> <b>Customers need to look for genuine online chatbots only depending on chatbots</b> <b>If chatbot training is not proper, customers are unsatisfied</b>
<b>Areas of opportunity</b> How might we make each step better? What does do we hope? What have others suggested?	<b>Chatbots are available 24x7</b> <b>Chatbots provides privacy</b>	<b>Chatbots provides accurate answers</b> <b>Chatbots has a customizable user interface</b>	<b>Chatbots maintain confidential conversations</b> <b>Chatbots are easily accessible by customers at their convenience</b> <b>Chatbots are intelligent and well trained to resolve customer queries</b>	<b>Chatbots are simple and efficient for customer usage</b> <b>Chatbots works fast enough to provide instant solutions to customer queries</b> <b>Chatbots improve customer satisfaction</b> <b>Chatbots are portable and suitable to replace</b>

## 4. Project Design Phase-II

### 4.1 Data Flow Diagrams:





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-1
	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-1
	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
		USN-9	As a user, I want to get the procedure details for Currency Conversion facility of my bank account	I can clear my queries regarding currency conversion facilities of bank account	Low	Sprint-2
	General Queries Related Actions	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

## 4.2Solution Requirements (Functional & Non-functional)

### Functional Requirements:

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	<b>Savings Account Related Actions</b>	<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	<b>Current Account Related Actions</b>	<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	<b>Loan Account Related Actions</b>	<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	<b>General Queries Related Actions</b>	<ul style="list-style-type: none"> <li>• Bank Working Days</li> <li>• List of Braches</li> <li>• Storage Locker Facility</li> <li>• Currency Conversion Facility</li> <li>• CIBIL</li> <li>• Find a nearest branch</li> </ul>
FR-5	<b>Net Banking Related Actions</b>	<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>

### Non-functional Requirements:

<b>NFR No.</b>	<b>Non-Functional Requirement</b>	<b>Description</b>
NFR-1	<b>Usability</b>	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	<b>Security</b>	The AI Chatbot maintains a confidential conversation with customers. Chatbot will provide personal and efficient communication between the user and the bank.
NFR-3	<b>Reliability</b>	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	<b>Performance</b>	AI Chatbots are a great way to overcome the limitation of workload of humans. There can be multiple instances of a single chatbot inquiring 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	<b>Availability</b>	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.



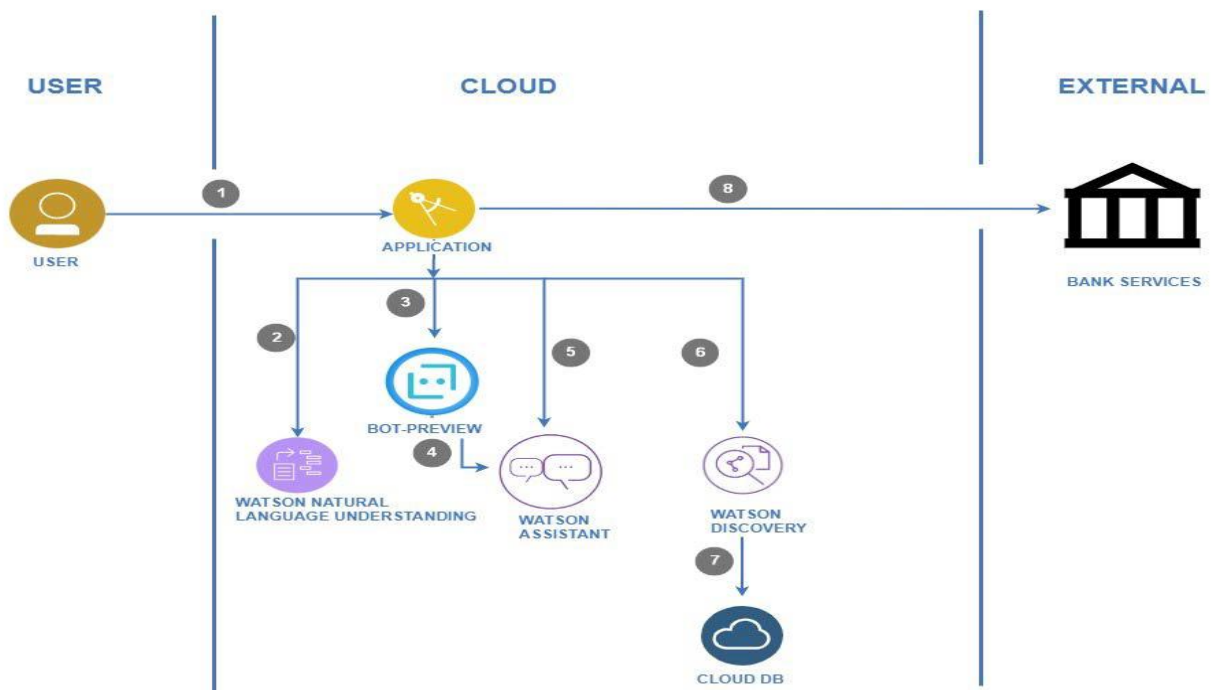
NFR-6	Scalability	AI Chatbots are helping banking industry to scale their customer service and to improve customer service satisfaction at the same time. It can be scaled as per the requirements of the bank to include answers to queries related to any new feature or service introduced by the bank.
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### 4.3 Technology Stack (Architecture & Stack)

#### Technical Architecture Steps:

- User queries to the Chat Bot
- Bot previews the query
- Query is transferred to Watson Assistant
- Natural Processing Language is used to understand the query
- Watson Assistant sends the query
- Watson finds the relevant response from cloud database
- Queries and responses (sent and received) is stored in cloud database
- All queries and related information is sent to the bank for improvement

### 4.4 Technical Architecture :



**Table-1 : Components & Technologies:**

S.No	Component	Description	Technology
1.	Bot Preview	A simple page is presented to the user with a chat layout that has an input box field available to get user queries and preset options are presented for the user to select.	HTML, CSS, JavaScript
2.	Application Logic-1	An input bar is provided that enables the user to type queries.	Java / Python
3.	Application Logic-2	Regularly asked queries or options are presented to the user.	IBM Watson STT service
4.	Application Logic-3	Processes responses to custom queries and displays a relevant response.	IBM Watson Assistant
5.	Cloud Database	Queries and answers to queries are stored in the cloud and are accessed whenever a query is asked.	IBM Cloudant DB
6.	External API-1	It provides an interface between the application and the cloud to send the query from the application to the cloud.	Watson Assistant v2 API
7.	External API-2	A cloud based API that supports several cloud based applications and operations.	IBM Cloud API
8.	Deep Learning Model	It is trained with several queries and uses that knowledge to provide relevant responses to queries with a good enough accuracy.	Deep Learning
9.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Flask Application Cloud Server Configuration: IBM Cloud	Python Flask, IBM Cloud

**Table-2: Application Characteristics:**

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

## 5.Project Planning phase

### 5.1Milestone and Activity List

#### Project Milestone and Tasks/Activities:

Milestone	Task	Starting Date	Ending Date	Project Completion Status	Team Members
<b>Create IBM Service</b>	Creation of Banking Chatbot or Assistant using IBM Watson Assistant	24 Oct 2022	25 Oct 2022	9%	Avinesh S,Karan K,Kesavan M,Manoj Raj M
	Understanding Customer's Banking Related Queries and skills	25 Oct 2022	29 Oct 2022	15%	Avinesh S,Karan K,Kesavan M
<b>Create Skills and Assistant for Chatbot</b>	Training the Chatbot with Banking related dataset	31 Oct 2022	01 Nov 2022	24%	Avinesh S,Karan K,Kesavan M,Manoj Raj M
	Building action and Adding responses to Account Creation	01 Nov 2022	02 Nov 2022	29%	Avinesh S
	Building action and Adding responses to Banking related queries	02 Nov 2022	03 Nov 2022	34%	Karan K
	Building action and Adding responses to Net Banking	03 Nov 2022	04 Nov 2022	39%	Avinesh S
	Building action and Adding responses to Loan Queries	04 Nov 2022	05 Nov 2022	44%	Kesavan M
<b>Testing Assistant &amp; Integrate with Flask webpage</b>	Testing the chatbot performance with the trained banking functionalities or conversations	07 Nov 2022	09 Nov 2022	60%	Avinesh S, Manoj Raj M
	Integration of Flask webpage with the chatbot assistant to provide a framework	09 Nov 2022	12 Nov 2022	83%	Karan K, Kesavan M
<b>Deployment Of Chatbot</b>	Final Deployment of AI based chatbot for	14 Nov 2022	19 Nov 2022	100%	
	banking Industry or Running the Chatbot service in fully efficient and effective condition				Avinesh S, Manoj Raj M, Karan K, Kesavan M

# Project Planning (Product Backlog, Sprint Planning, Stories, Story points)

## Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Use the below template to create product backlog and sprint schedule

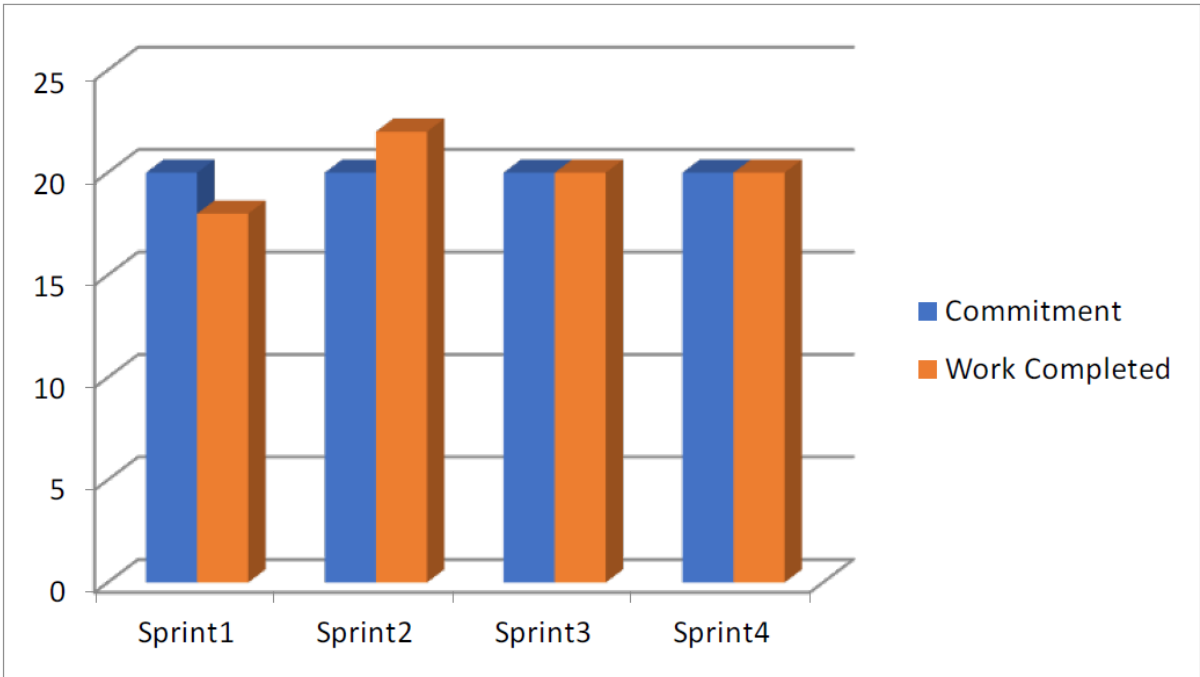
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Savings Account Related Actions	USN-1	As a user, in the Savings Account option, I can select Types of Savings Account to get details regarding documents required for creating that savings account.	4	High	Avinesh S
Sprint-1		USN-2	As a user, I can check the Interest Rates of Savings Account	4	High	Avinesh S
Sprint-1		USN-3	As a user, I can check the Minimum Balance of Savings Account	3	Medium	Avinesh S
Sprint-1	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	5	High	Karan K
Sprint-1		USN-5	As a user, I want to get details on procedure to close my Current Account	4	High	Karan K
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	3	High	Kesavan M
Sprint-2		USN-7	As a user, I can check the Loan Amounts that can be offered for corresponding Loan Accounts chosen	3	High	Kesavan M
Sprint-2		USN-8	As a user, I can check the Status of Loan for my Loan Accounts	1	Low	Kesavan M

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-2	General Queries Related Actions	USN-9	As a user, I want to get the procedure details for Currency Conversion facility of my bank account	2	Medium	Karan K
Sprint-2		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.	1	Low	Manoj Raj M Kesavan M
Sprint-2		USN-11	As a user, I want to get the procedure details for maintaining Storage Locker facility of my bank account	3	High	Manoj Raj M Kesavan M
Sprint-2	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	3	High	Manoj Raj M
Sprint-2		USN-13	As a user, I can select types of fund transfers to get details regarding different services available in net banking	2	Medium	Manoj Raj M
Sprint-2		USN-14	As a user, I want to get the procedure details for adding beneficiaries to my net banking account.	2	Medium	Manoj Raj M
Sprint-3	Web Application	USN-15	As a user, I want to access the chatbot in a web browser that can be accessed from almost all devices.	20	High	Karan K Kesavan M
Sprint-4	User Interface and Web Pages	USN-16	As a user, I want to view pages of the banking website and have access to the chatbot easily.	20	High	Manoj Raj M Avinesh S

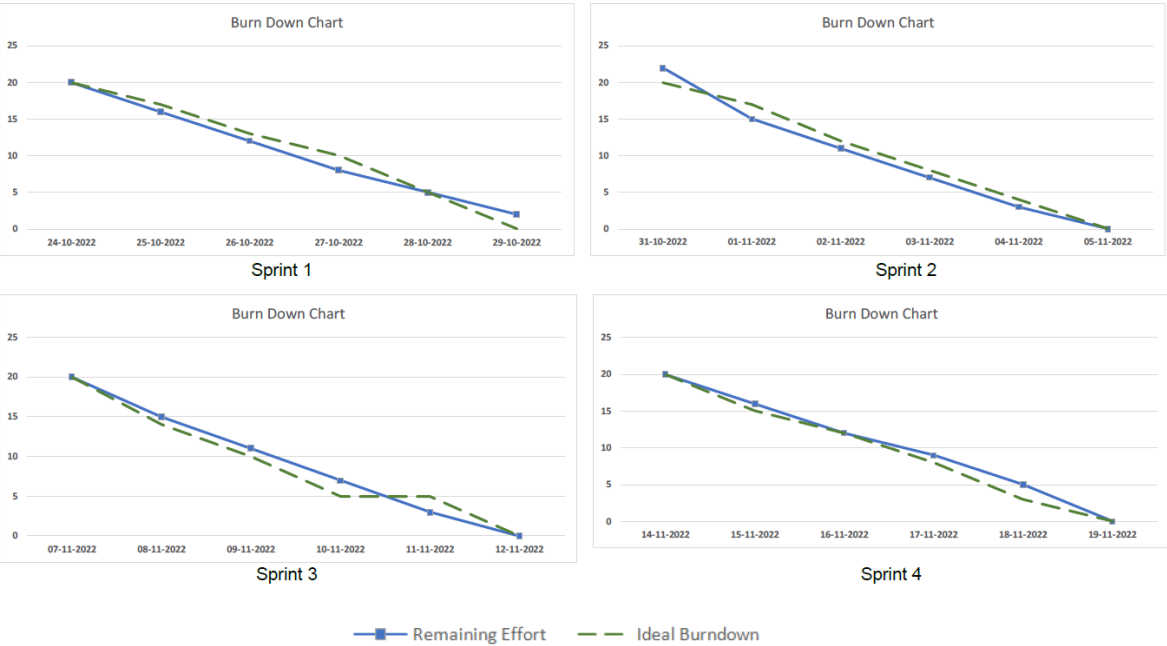
## Project Tracker, Velocity & Burndown Chart: (4 Marks)

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	18	02 Nov 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	22	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 Chart:



Burndown Chart:



Projects / AI based Discourse for Banking Industry

Backlog

...

Search backlog

PJ

A

RK

A

Epic ▾

Insights

ABDFBI Sprint 1 24 Oct – 29 Oct (5 issues)

0 0 0

Start sprint

...

ABDFBI-1 As a user, in the Savings Account option, I can select Types of Sa...

SAVINGS ACCOUNT RELATED ACTI...

IN PROGRESS ▾

A

ABDFBI-2 As a user, I can check the Interest Rates of Savings Account

SAVINGS ACCOUNT RELATED ACTI...

IN PROGRESS ▾

A

ABDFBI-3 As a user, I can check the Minimum Balance of Savings Account

SAVINGS ACCOUNT RELATED ACTI...

TO DO ▾

A

ABDFBI-4 As a user, I can choose the Type of Company to know the inform...

CURRENT ACCOUNT RELATED ACT...

IN PROGRESS ▾

PJ

ABDFBI-5 As a user, I want to get details on procedure to close my Current Acco...

CURRENT ACCOUNT RELATED ACT...

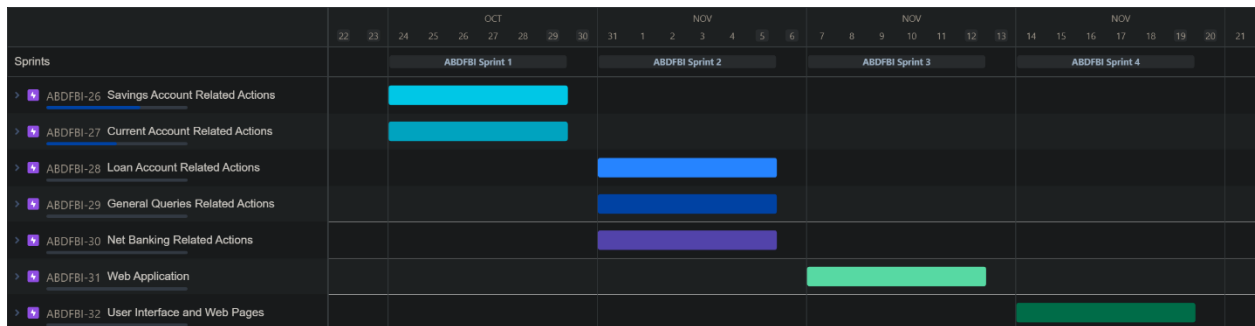
TO DO ▾

PJ

+ Create issue

Quickstart

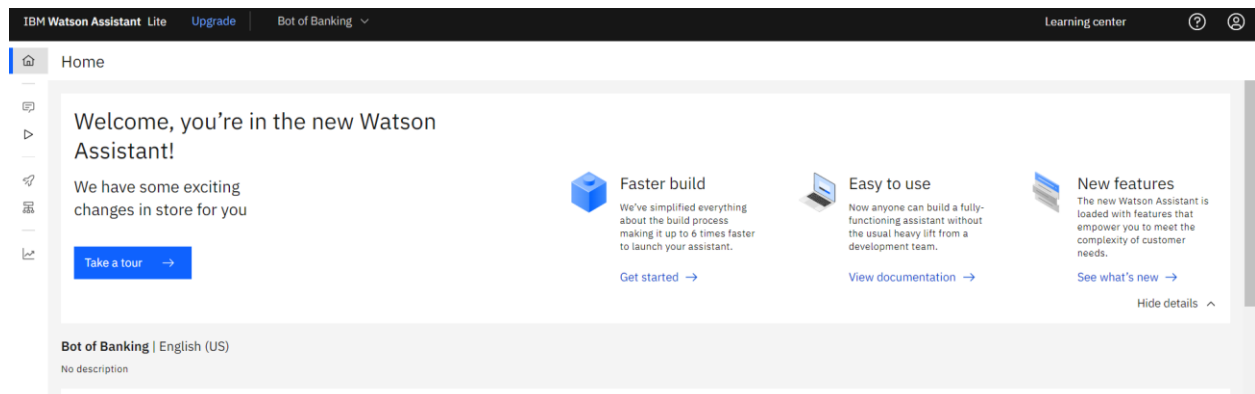
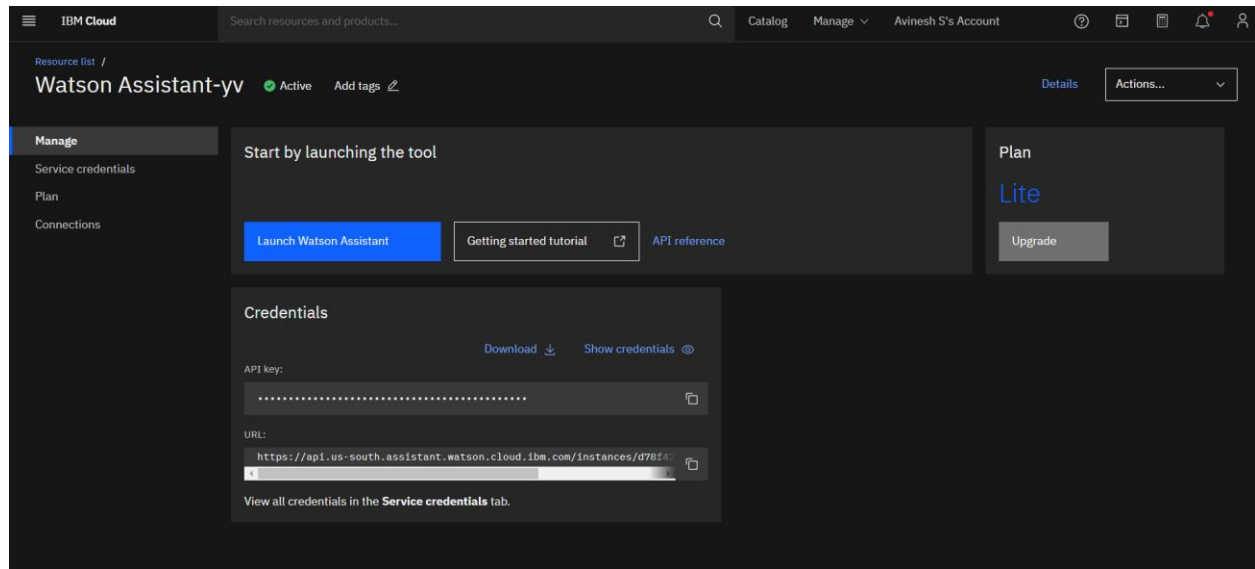
×



## 6. Project Development Phase:

### 6.1. Sprint 1:

**Step 1:** Create IBM Watson and activate the skills in it.



## 6.2 Sprint 2:

### Step 1: Create action for Greetings.

The screenshot shows the IBM Watson Assistant interface for creating a new action named "Greeting". The top navigation bar includes "IBM Watson Assistant Lite", "Upgrade", and "BankBot". The left sidebar shows the "Greeting" action selected. The main panel is divided into two sections. On the left, under "Conversation steps", step 1 is defined with the text "Hi, Good to see you." and a "Go to action: Index" instruction. On the right, the "Customer starts with:" section provides instructions on how to define phrases for the action. It includes a list of phrases: "Greeting", "Hello", "Hi", and "Hey", with a "Total: 4" count. A "New step" button is visible at the bottom left.

### Step 2: Create action for Index

The screenshot shows the IBM Watson Assistant interface for creating a new action named "Index". The top navigation bar includes "IBM Watson Assistant Lite", "Upgrade", and "BankBot". The left sidebar shows the "Index" action selected. The main panel is divided into two sections. On the left, under "Conversation steps", step 1 is defined with the text "How can I help you.?" and a "Continue to next step" instruction. Below this, there are two additional steps: "Current Account" and "Savings Account", each with a "Go to action" instruction. On the right, the "Assistant says" section shows the response "How can I help you..?". Below this, there is a "JSON added" section with the text "{custom response type}". At the bottom, the "And then" section shows a "Continue to next step" instruction. A "New step" button is visible at the bottom left.



### Step 3: Create action for Savings Account.

The screenshot shows the IBM Watson Assistant Lite interface for creating a new action for a Savings Account. The top bar includes 'IBM Watson Assistant Lite', 'Upgrade', and 'BankBot'. The left sidebar shows the 'Savings' conversation flow with three steps. Step 1 is highlighted, showing a prompt 'What type of Saving account you need to create..?' with a 'Continue to next step' button. Step 2 shows a prompt 'Great, take the following documents and reach the nearest branch.' with a 'Free text' input field. Step 3 shows a prompt 'Great, take the following documents and reach the nearest branch.' with a 'Free text' input field. The main area shows the 'Step 1 is taken' status with a dropdown menu set to 'without conditions'. The 'Assistant says' section displays the prompt 'What type of Saving account you need to create..?' and a 'JSON added (custom response type)' button. Below this, there are 'Edit response' and 'Edit validation' buttons. The 'And then' section shows a 'Continue to next step' button. A 'New step +' button is at the bottom left.

### Step 4: Create action for Current Account.

The screenshot shows the IBM Watson Assistant Lite interface for creating a new action for a Current Account. The top bar includes 'IBM Watson Assistant Lite', 'Upgrade', and 'BankBot'. The left sidebar shows the 'Current' conversation flow with three steps. Step 1 is highlighted, showing a prompt 'What's your company type..?' with 'Partnership' and 'Proprietorship' buttons. Step 2 shows a prompt 'Please take the following documents and reach the nearest bank.' with a 'Free text' input field. Step 3 shows a prompt 'Please take the following documents and reach the nearest bank.' with a 'Free text' input field. The main area shows the 'Step 1 is taken' status with a dropdown menu set to 'without conditions'. The 'Assistant says' section displays the prompt 'What's your company type..?' and a 'Proprietorship' button. Below this, there are 'Edit response' and 'Edit validation' buttons. The 'And then' section shows a 'Continue to next step' button. A 'New step +' button is at the bottom left. A 'Preview' button is at the bottom right.

## Step 5 : Create action for End.

The screenshot shows the IBM Watson Assistant Lite interface. At the top, there's a header with "IBM Watson Assistant Lite", "Upgrade", and "BankBot". Below the header, the "End" tab is selected. The "Conversation steps" panel on the left shows a list of steps. Step 1 is highlighted, with a "Yes" button and a "Continue to next step" action. Step 2 is "Thank you. Have a nice day." with an "Action complete" status. Step 3 is "This step has no content" with a "Go to action: Index" action. The "Assistant says" panel on the right shows the text "Do you have any other queries to ask..?" with a "Continue to next step" action. The "And then" panel shows the "Continue to next step" action. A "Preview" button is visible at the bottom right.

## Output Screenshots:

The screenshot shows the chat interface with a pink header bar containing "Preview", a refresh icon, and a minus icon. The chat history shows a "Greet customer [default]" action with the text "Welcome, how can I assist you?". A user input bubble says "Hi". The system response shows "Greeting recognized" and "Hi, Good to see you." followed by "go to Index". A dropdown menu is visible with the text "Select an option". The input field at the bottom says "Type something..." with a send button.

The screenshot shows the chat interface with a pink header bar. The chat history shows a "Passport size Photo" action. A user input bubble says "Thanks". The system response shows "go to End" and "Do you have any other queries to ask..?" with "Yes" and "No" buttons. A user input bubble says "No". The system response shows "Thank you. Have a nice day." and "There are no additional steps for this action. Add a new step or end the action." followed by "Greeting ended". The input field at the bottom says "Type something..." with a send button.

The screenshot shows the chat interface with a pink header bar. The chat history shows a "What type of Saving account you need to create..?" action. A user input bubble says "Regular Savings Account". The system response shows "Regular Savings Account" and "Great, take the following documents and reach the nearest branch." followed by a list of documents: "Aadhar Card", "Pan Card", and "Passport size Photo". The input field at the bottom says "Use the up arrow for prior messages" with a send button.

## 6.3.Sprint 3

Step 1: Created action for Net banking.

The screenshot shows the IBM Watson Assistant interface for a 'Net Banking' action. The top bar includes 'IBM Watson Assistant Lite', 'Upgrade', 'BankBot', and 'Learning center'. The left sidebar shows the 'Conversation steps' for 'Net Banking', with the first step highlighted: 'What queries do you have regarding net banking..?' with a '+2' icon. The main area shows the 'Assistant says' section with the text 'What queries do you have regarding net banking..?' and a list of suggested queries: 'What is Net Banking..?', 'How do I register for Net Banking..?', and 'What are the features of Net Banking..?'. Below this, the 'And then' section shows a 'Continue to next step' button. A 'Preview' button is visible at the bottom right.

Step 2: Created action for Queries

The screenshot shows the IBM Watson Assistant interface for a 'Queries' action. The top bar includes 'IBM Watson Assistant Lite', 'Upgrade', 'BankBot', and 'Learning center'. The left sidebar shows the 'Conversation steps' for 'Queries', with the first step highlighted: 'Please select the queries listed below.' with a '+4' icon. The main area shows the 'Assistant says' section with the text 'Please select the queries listed below.' and a 'Choose an option' dropdown menu. Below this, the 'And then' section shows a 'Continue to next step' button. A 'Preview' button is visible at the bottom right.

### Step 3: Created action for Loan Queries.

The screenshot displays the IBM Watson Assistant configuration interface for a 'Loan' action. The top bar includes 'IBM Watson Assistant Lite', 'Upgrade', 'BankBot', and a 'Learning center' link. The main workspace is divided into three panels:

- Conversation steps:** A list of steps for the 'Loan' action. Step 1 is 'What type of loan you looking for..?' with options 'Gold Loan' and 'Education Lo...'. Step 2 is 'Please approach the bank with the following details.' with a 'Go to action: End' button. Step 3 is 'Kindly approach the bank with the following documents.' with a 'Go to action: End' button. A 'New step +' button is at the bottom.
- Step 2 is taken with conditions:** A section for defining conditions for Step 2. It shows a single condition: 'If All of this is true: 1. What type of loan... is Gold Loan'. There is an 'Add condition +' button and a 'New condition group +' button.
- Assistant says:** A text area for the assistant's response. It contains the text: 'Please approach the bank with the following details. 1.Acceptance letter from Institution 2.Pan Card 3.Passport Size Photos'. A 'Preview' button is at the bottom right.

### Output Screenshots:

This screenshot shows the chat interface with a pink header bar containing 'Preview', a refresh icon, and a minus icon. The chat history shows:

- System: 'Greet customer [default]'
- System: 'Welcome, how can I assist you?' (with a 'Hi' bubble)
- System: 'Greeting recognized'
- System: 'Hi, Good to see you.'
- System: 'go to Index'
- System: 'How can I help you..?' (with a 'Net Banking' bubble)

At the bottom, there is a text input field with 'Net Banking' and a 'Use the up arrow for prior messages' instruction.

This screenshot shows the chat interface with a pink header bar containing 'Preview', a refresh icon, and a minus icon. The chat history continues from the previous screenshot:

- System: '4)Make merchant payments. 5)Transfer funds. 6)Order a cheque book. 7)Buy general insurance. 8)Recharge prepaid mobile/DTH.'
- System: 'go to End'
- System: 'Do you have any other queries to ask..?' (with 'Yes' and 'No' buttons)
- User: 'No' (with a 'No' bubble)
- System: 'Thank you. Have a nice day.'
- System: 'There are no additional steps for this action. Add a new step or end the action.'
- System: 'Greeting ended'

At the bottom, there is a text input field and a 'Use the up arrow for prior messages' instruction.

## 6.4.Sprint 4

Step 1: Created python Flask app

```
from flask import Flask, render_template
```

```
app = Flask(__name__)
```

```
@app.route('/')
```

```
@app.route('/home')
```

```
def home():
```

```
    return render_template('index.html')
```

```
if __name__ == '__main__':
```

```
    app.run(debug=True)
```

## 7.Coding

### HTML Coding for sample website

```
<!DOCTYPE html>
```

```
<html>
```

```
  <head>
```

```
    <link
```

```
      href="https://fonts.googleapis.com/css?family=IBM+Plex+Sans+Devanagari&displ  
ay=swap"
```

```
      rel="stylesheet"
```

```
    />
```

```
  <link
```

```
    href="https://fonts.googleapis.com/css?family=Inter&display=swap"
```

```
    rel="stylesheet"
```

```
  />
```

```
</head>
```

```
<body>
```

```
  <script>
```

```
    window.watsonAssistantChatOptions = {
```

integrationID: 'd78ba8b2-e69f-49b7-885f-91b9cb77f774', // The ID of this integration.

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

serviceInstanceID: 'd78f4297-f08f-42be-8984-bd26ef4b5fb1', // 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>
```

```
<div>
```

```
  <div class="v1_10"></div>
```

```
  <span class="v1_11">Bank of Noobs</span>
```

```
  <span class="v6_2">About Us</span><span class="v6_6">Service</span>
```

```
  <span class="v6_3">Home</span>
```

```
  <span class="v6_7">This is the prototype for test run.</span>
```

```
</div>
```

```
</body>
```

```
</html>
```

```
<br /><br />
```

```
<style>
```

```
  * {
```

```
    box-sizing: border-box;
```

```
  }
```

```
  body {
```

```
    font-size: 14px;
```

```
}  
.v1_5 {  
  width: 100%;  
  height: 817px;  
  background: linear-gradient(rgba(255, 255, 255, 1), rgba(255, 255, 255, 0));  
  opacity: 1;  
  position: relative;  
  top: 0px;  
  left: 0px;  
  overflow: hidden;  
}  
.v1_6 {  
  width: 100%;  
  height: 973px;  
  background: url('../images/v1_6.png');  
  background-repeat: no-repeat;  
  background-position: center center;  
  background-size: cover;  
  opacity: 1;  
  position: relative;  
  top: 0px;  
  left: 0px;  
  overflow: hidden;  
}  
.v1_10 {  
  width: 98%;  
  height: 58px;  
  background: rgba(255, 255, 255, 0.6499999761581421);  
  opacity: 1;  
  position: absolute;  
  top: 13px;  
  left: 14px;  
  border: 1px solid rgba(0, 0, 0, 1);  
  border-top-left-radius: 41px;  
  border-top-right-radius: 41px;
```

```
border-bottom-left-radius: 41px;
border-bottom-right-radius: 41px;
overflow: hidden;
}
.v1_11 {
width: 200px;
color: linear-gradient(rgba(188, 0, 255, 1), rgba(127, 0, 255, 1));
position: absolute;
top: 23px;
left: 36px;
font-family: IBM Plex Sans Devanagari;
font-weight: Bold;
font-size: 25px;
opacity: 1;
text-align: left;
}
.v6_2 {
width: 100px;
color: rgba(0, 0, 0, 1);
position: absolute;
top: 30px;
left: 1200px;
font-family: Inter;
font-weight: Regular;
font-size: 20px;
opacity: 1;
text-align: left;
}
.v6_6 {
width: 65px;
color: rgba(0, 0, 0, 1);
position: absolute;
top: 30px;
left: 1330px;
font-family: Inter;
```



```
font-weight: Regular;  
font-size: 20px;  
opacity: 1;  
text-align: left;  
}
```

```
.v6_3 {  
width: 53px;  
color: rgba(0, 0, 0, 1);  
position: absolute;  
top: 30px;  
left: 1100px;  
font-family: Inter;  
font-weight: Regular;  
font-size: 20px;  
opacity: 1;  
text-align: left;  
}
```

```
.v6_5 {  
width: 38px;  
height: 38px;  
background: url('../images/v6_5.png');  
opacity: 1;  
position: absolute;  
top: 22px;  
left: 294px;  
border-radius: 50%;  
}
```

```
.v6_7 {  
width: 929px;  
color: #9d59b8;  
position: absolute;  
top: 180px;  
left: 36px;  
font-family: Inter;  
font-weight: Bold;
```

```
font-size: 100px;
opacity: 1;
text-align: left;
}
</style>
```

## 8.Conclusion

As we can see, chatbots and other types of AI assistants are of great use in any industry that has to provide high-quality customer support. One such industry is the finance or banking area, and it is rapidly integrating these technologies into its workflow. Banking is all about money and reputation, and AI chatbots offer numerous benefits for both.

## 6.References:

**[1]. The Impact of Chat-Bots on the Banking Experience** published at April 2021.

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**[2]. Banking Chatbot (B-Bot)**

Author: Dr. C. Punitha Devi, Dr. S. Geetha , N. Nagalakshmi , S. Karthiga, V. Suvedha.

Article History: Received: 10 January 2021; Revised: 12 February 2021; Accepted: 27 March 2021; Published online: 28 April 2021

**[3]. A Review of Chatbots in the Banking Sector** published at June 2021

Author: Shashank Bairy R, Rashmi R.

**[4]. A study of applications at Artificial Intelligence in Banking and Finance Sector** pulished at 32 May 2022.

Author: Dr. Lakshkaushik Dattatraya Puri.