PROJECT REPORT

AI BASED DISCOURSE FOR BANKING INDUSTRY

Team ID: PNT2022TMID01193

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1.INTRODUCTION

1.1 PROJECT OVERVIEW

Everyone wants to get fast that they want. Chatbots are intelligent systems that understands user's questions and answers accordingly. Going to banks and ask questions to any bank employee, the procedure takes too much time to process a single question. So our focus is to make an intelligent assistant System that will save time of users and reduce workload of bank employees. It is like a personal assistant that user feels that they are communicating with a person. The user can ask their queries in plain text in English or in voice. According to user's query the system will process the query and generate response. To complete these tasks we have used artificial intelligence and natural language processing. The system will be usable as a web so it can be easily accessible. It can be run on the pc or mobile phones.

Keywords: Natural Language Processing, Artificial Intelligence, Banking Bot, Chat Bot

1.2 PURPOSE

- ➤Chatbots, also known as conversational agents, are **designed with the help of AI (Artificial Intelligence) software**. They simulate a conversation (or a chat) with users in a natural language via messaging applications, websites, mobile apps, or phone.
- ➤Industries are forced to evolve and update their practices due to technological advances and the contemporary market. The banking sector is one of the most developed sectors and is always looking for the latest technological solutions that improve its efficiency.
- ➤Net banking websites are complex and involve navigating through numerous pages to find the information you need. Bank staff undergoes a lot of stressful situations when communicating with clients directly. Such situations can be avoided gracefully by using chatbots.
- ➤Banking has become the part and parcel of everyone's life. Almost everyone uses the banking sector to perform their tasks. Most of the tasks are been carried out manually. Now the use of mobile and internet banking facility has reached greater heights. Chat bots is becoming trending today. They are computer programs that interact with users using natural languages.
- ➤In this project aims to discuss the relevance of chatbots in the banking sector and explore how chatbots can be implemented using natural language processing techniques that can be used in the banking industry.

2.LITERATURE SURVEY:

2.1 Existing Problem

- ✓ This paper [1] presents the use of the RASA framework for building smart context-remembering chatbots, it also describes how Rasa NLU works and how its performance is elevated by using intent recognition and entity extraction. It also compares the accuracies of entity extraction using Rasa NLU and a NN, results show Rasa NLU performs better to extract entities when whole sentences are provided as compared to neural networks which require segmented inputs. This paper discusses Rasa by implementing a chatbot related to the finance domain, using which the users can inquire about stock-related information.
- ✓ RASA NLU can introduce a vital component in intelligent chatbot systems.We can compose the system to extract the entity after intent recognition.This can be further improved for complicated sentences and more entities.
- ✓ This paper [2] briefly discusses advancements in the field of AI and how this has led to major shifts in some organizations about how they operate. It further mentions how the banking industry has moved to use chatbots for providing an interface to customers so that they can have an assistant throughout the day for service. This paper also gauges the ability of current chatbots to provide all the services that a user needs.
- ✓ It includes several strategies for managing dialogue in the banking and finance industry based on ontology. Although further use of AI can make the chatbot not only respond to questions but also self-learning to improve itself in more stages, improving user service quality and also reducing human load.

2.2 References

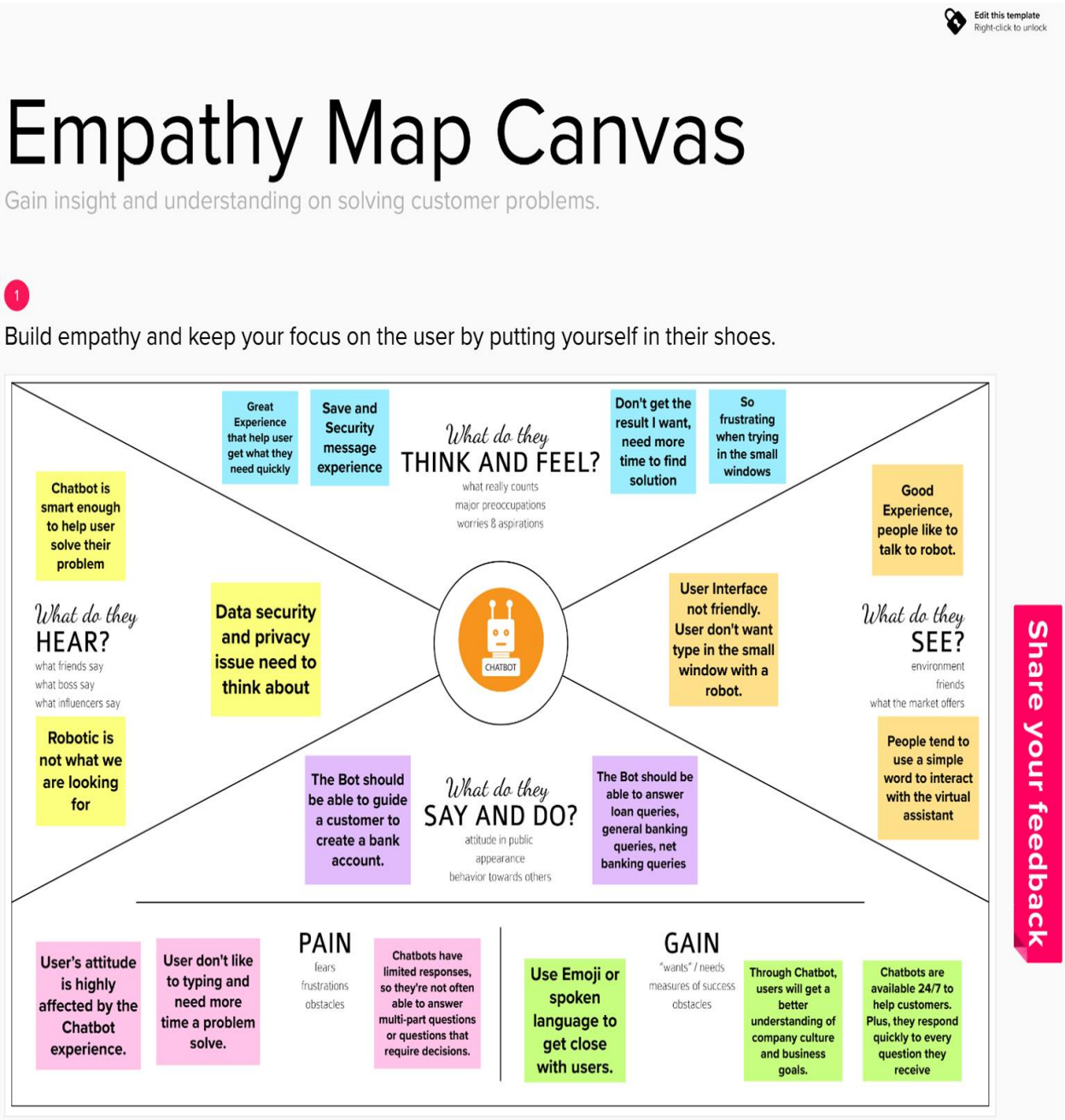
- Shivkumar Goel and Nihaal Mehta A Survey on the Role of Artificial Intelligence in FinTech, International Journal of Innovative Research in Computer and communication Engineering, Vol.5, Issue 6, June 2017.
- S. A. Abdul-Kader and J. Woods, "Survey on Chatbot Design Techniques in Speech Conversation Systems", *(IJACSA) International Journal of Advanced Computer Science and Applications*, vol. 6, no. 7, July 2015.
- S. F. Suhel, V. K. Shukla, S. Vyas and V. P. Mishra, "Conversation to Automation in Banking Through Chatbot Using Artificial Machine Intelligence Language," 2020 8th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions) (ICRITO), 2020, pp. 611-618, doi: 10.1109/ICRITO48877.2020.9197825.
- S. Meshram, N. Naik, M. VR, T. More and S. Kharche, "Conversational AI: Chatbots," *2021 International Conference on Intelligent Technologies (CONIT)*, 2021, pp. 1-6, doi: 10.1109/CONIT51480.2021.9498508.
- RASA NLU can introduce a vital component in intelligent chatbot systems. We can compose the system to extract the entity after intent recognition. This can be further improved for complicated sentences and more entities.
- It includes several strategies for managing dialogue in the banking and finance industry based on ontology. Although further use of AI can make the chatbot not only respond to questions but also improving user service quality and also reducing human load.

2.3 PROBLEM STATEMENT DEFINITION

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	Customer	Recharge for my prepaid mobile	I cannot pay recharge amount	It shows like your money is not debited	frustrated as I have money in my bank account
PS-2	Customer	Make merchant payments	QR code is not scanning	The website is not responsive	I am afraid as I do not know what to do

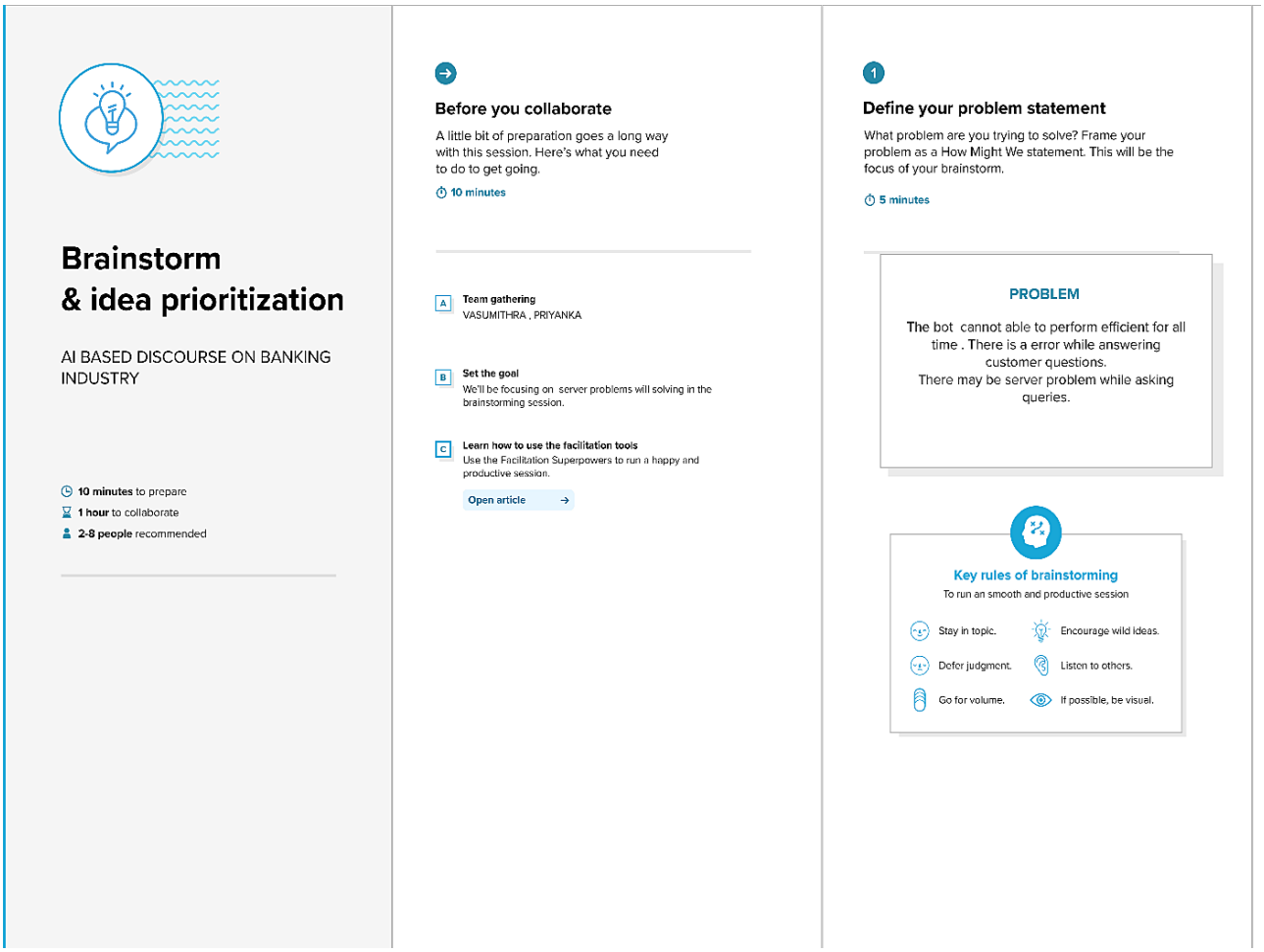
3.IDEATION & PROPOSED SOLUTION:

3.1 EMPATHY MAP CANVAS

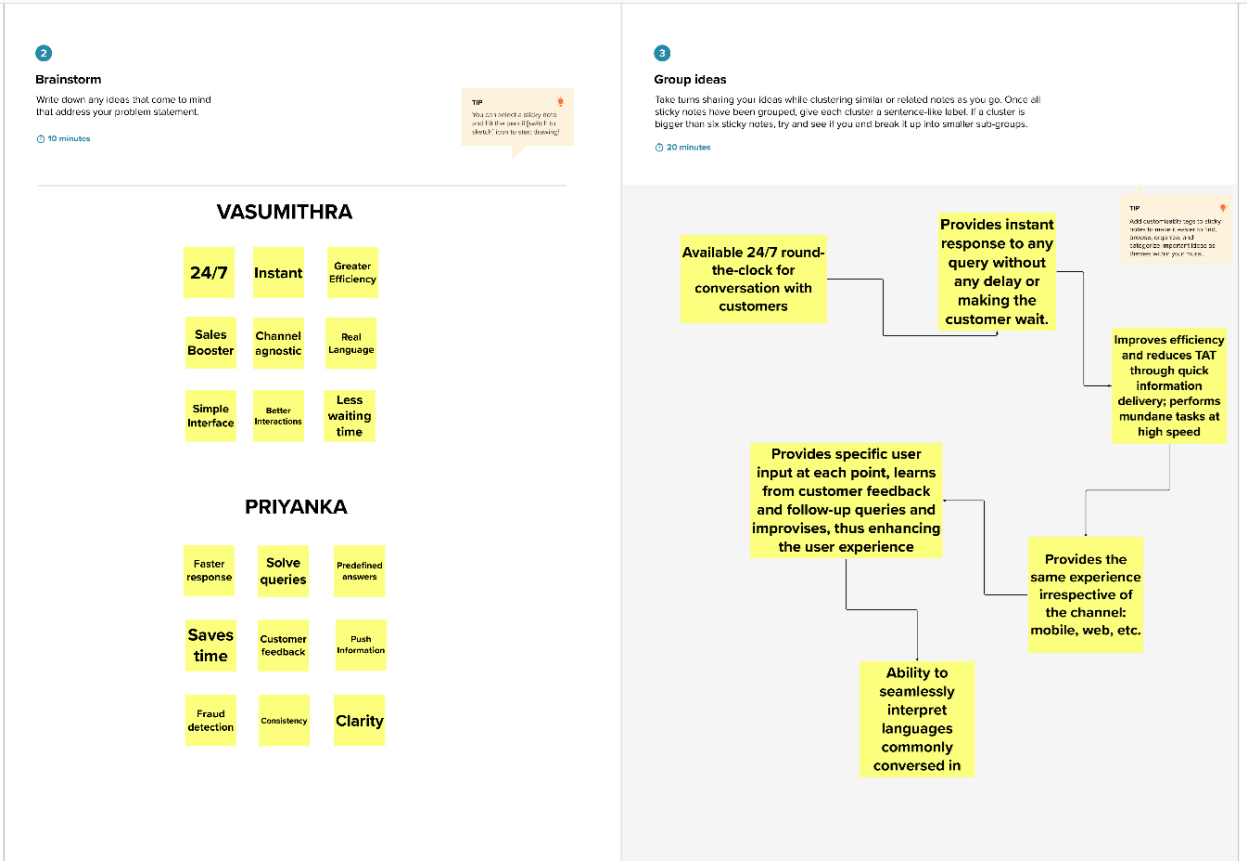


3.2 IDEATION & BRAINSTORMING

Step-1: Team Gathering, Collaboration and Select the Problem Statement



Step-2: Brainstorm, Idea Listing and Grouping

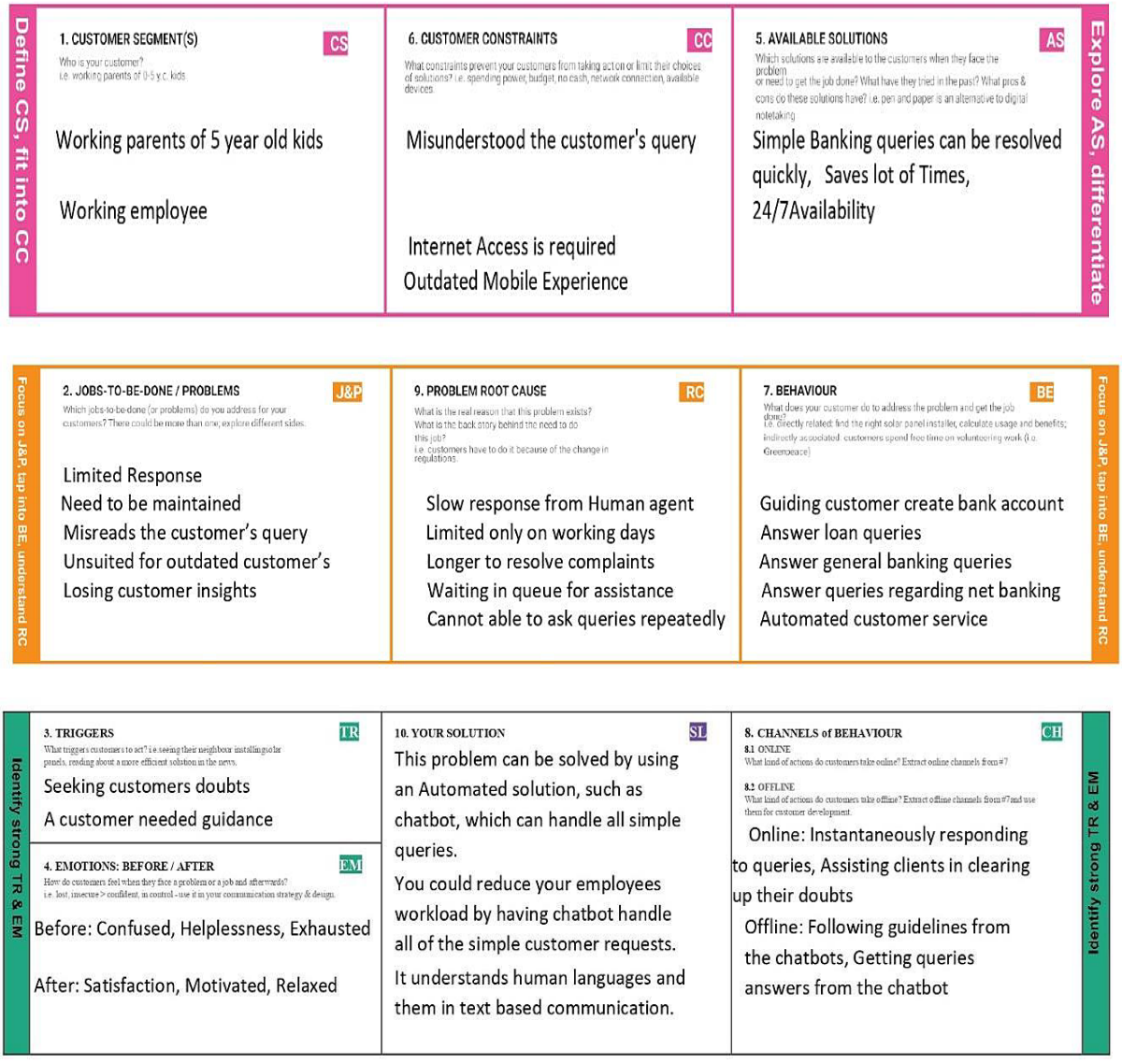


Step-3: Idea Prioritization

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 satisfactory way which in turn hinders the customer satisfaction. Customers need to visit banks frequently for single 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 centres 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 services 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 assistant 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



4.REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENTS

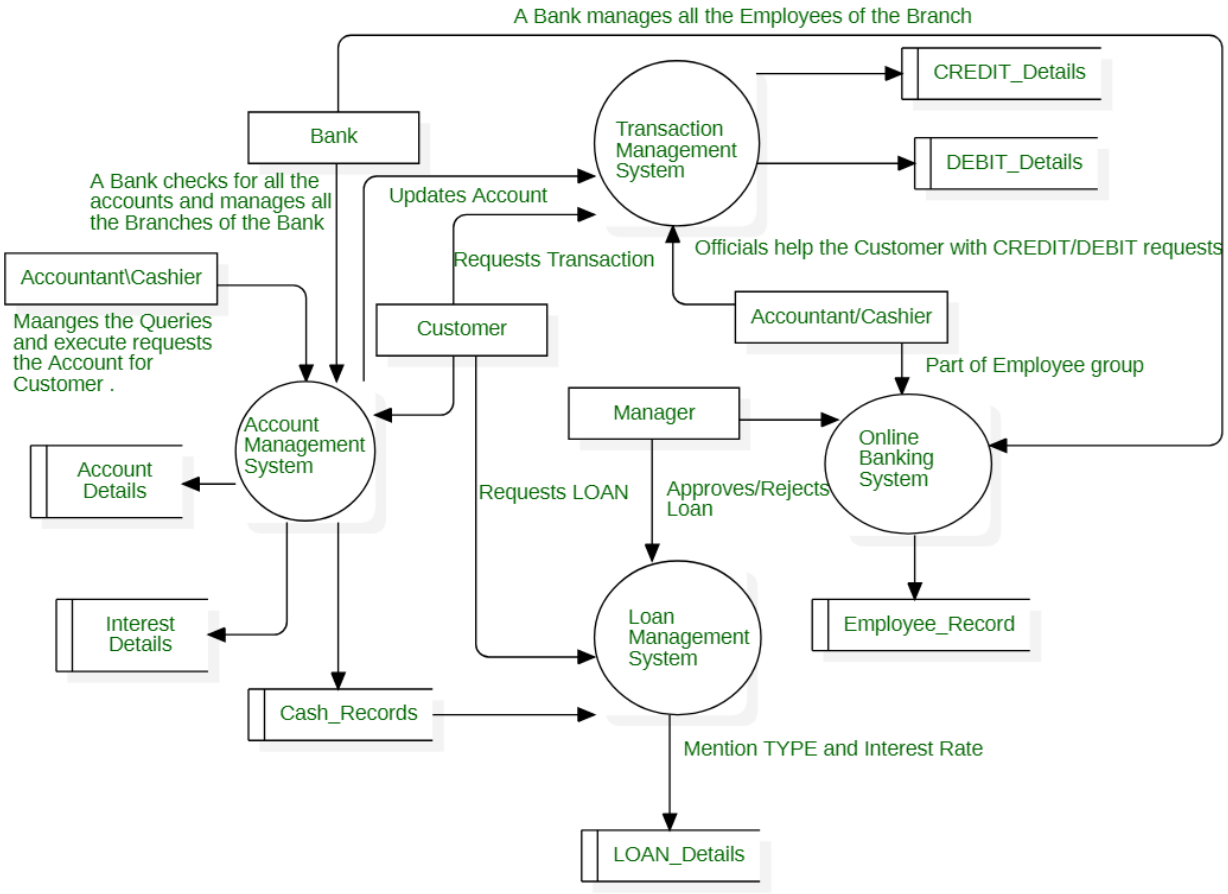
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Greeting	The MIS Assistant needs the capability to accurately tell time so as it greets users appropriately.
FR-4	Help Support	1. It should also have predefined questions and keywords with their expected answers. 2. The MIS Assistant needs the ability to quickly and accurately look up the question from its templates.
FR-5	Set Remainder	The MIS Assistant needs the ability to save and display reminders as requested by the users of the system.
FR-6	Announcement	This chatbot needs the capability of broadcasting a message to all users.
FR-7	Events	This chatbot needs the capability of retrieving & displaying events for a system.

4.2 NON - FUNCTIONAL REQUIREMENTS

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	**Non-functional requirements or NFRs** are a set of specifications that describe the system's operation capabilities and constraints and attempt to improve its functionality. These are basically the requirements that outline how well it will operate including things like speed, security, reliability, **data integrity**, etc
NFR-2	**Security**	Security is a non-functional requirement **assuring all data inside the system or its part will be protected against malware attacks or unauthorized access.**
NFR-3	**Reliability**	Non functional requirements are mostly quality-related requirements which include the areas of performance, availability, reliability, usability, flexibility, configurability, integration, maintainability, portability, and testability
NFR-4	**Performance**	Non functional Requirements (NFRs) **define system attributes such as security, reliability, performance, maintainability, scalability, and usability**. They serve as constraints or restrictions on the design of the system across the different backlogs.
NFR-5	**Availability**	There is no one standard definition of an Availability Non-Functional Requirement. It will be defined for each project where it needs to be specified. This principle is true of all non-functional requirements.

NFR-6	**Scalability**	AI adoption has grown rapidly over the past few years due to its ability to automate repetitive tasks and increase revenue opportunities. Yet many companies still struggle with how to meaningfully scale AI in financial services.

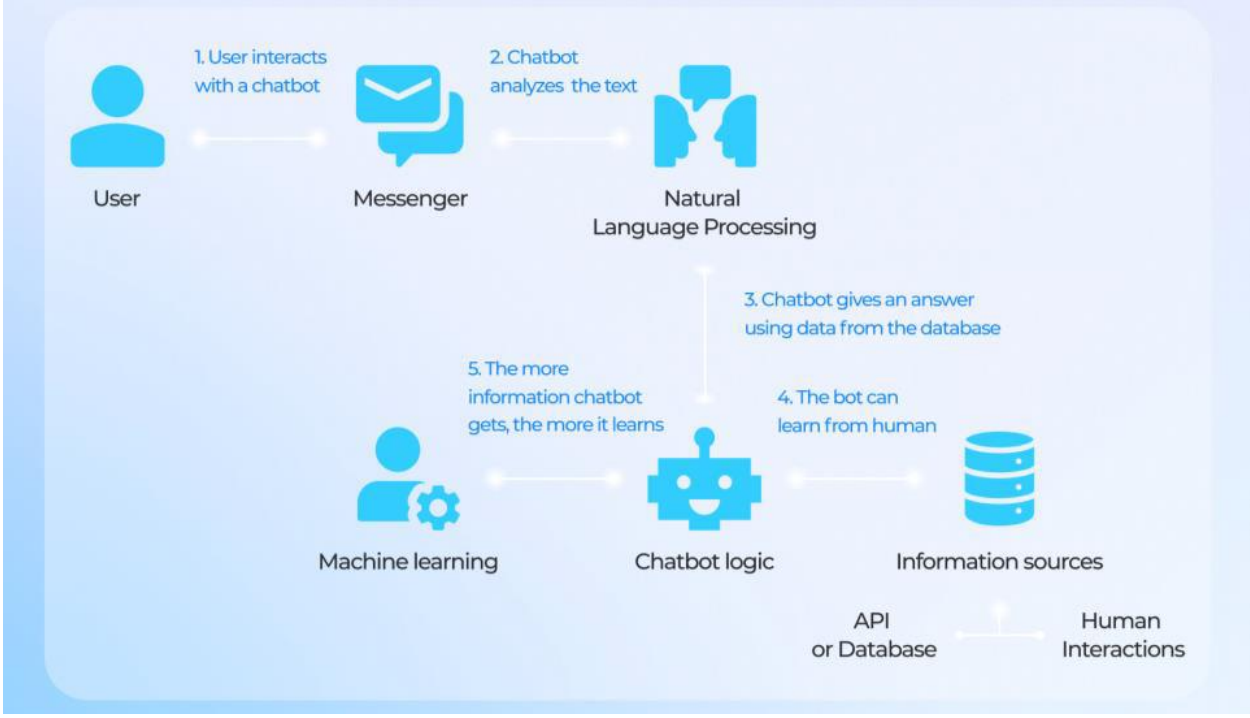
5.PROJECT DESIGN
5.1 DATA FLOW DIAGRAMS

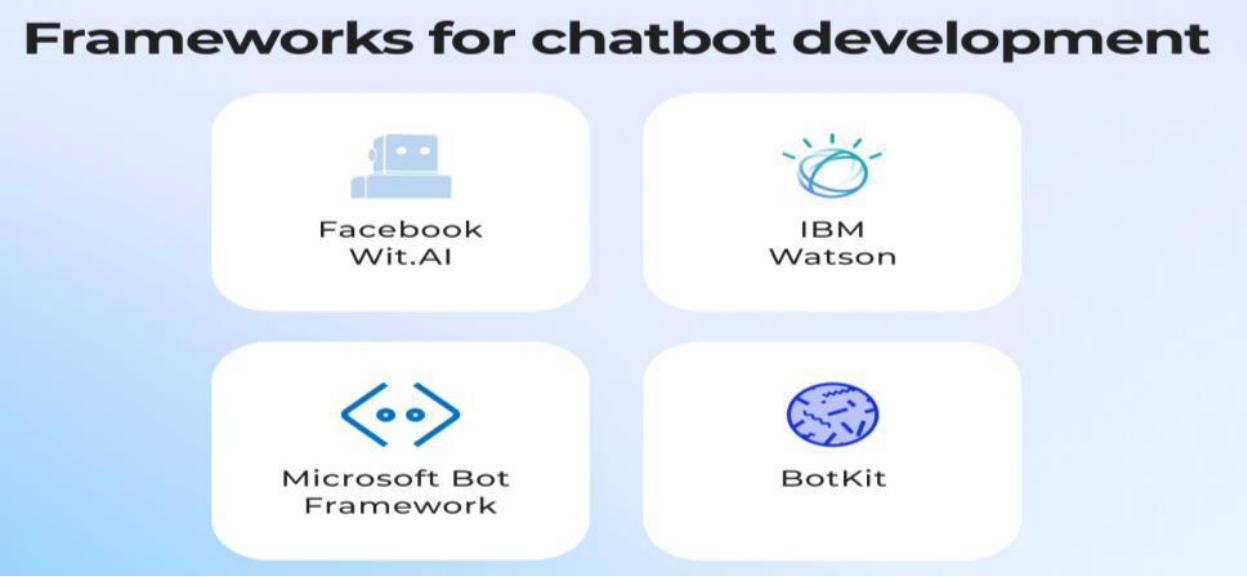


A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

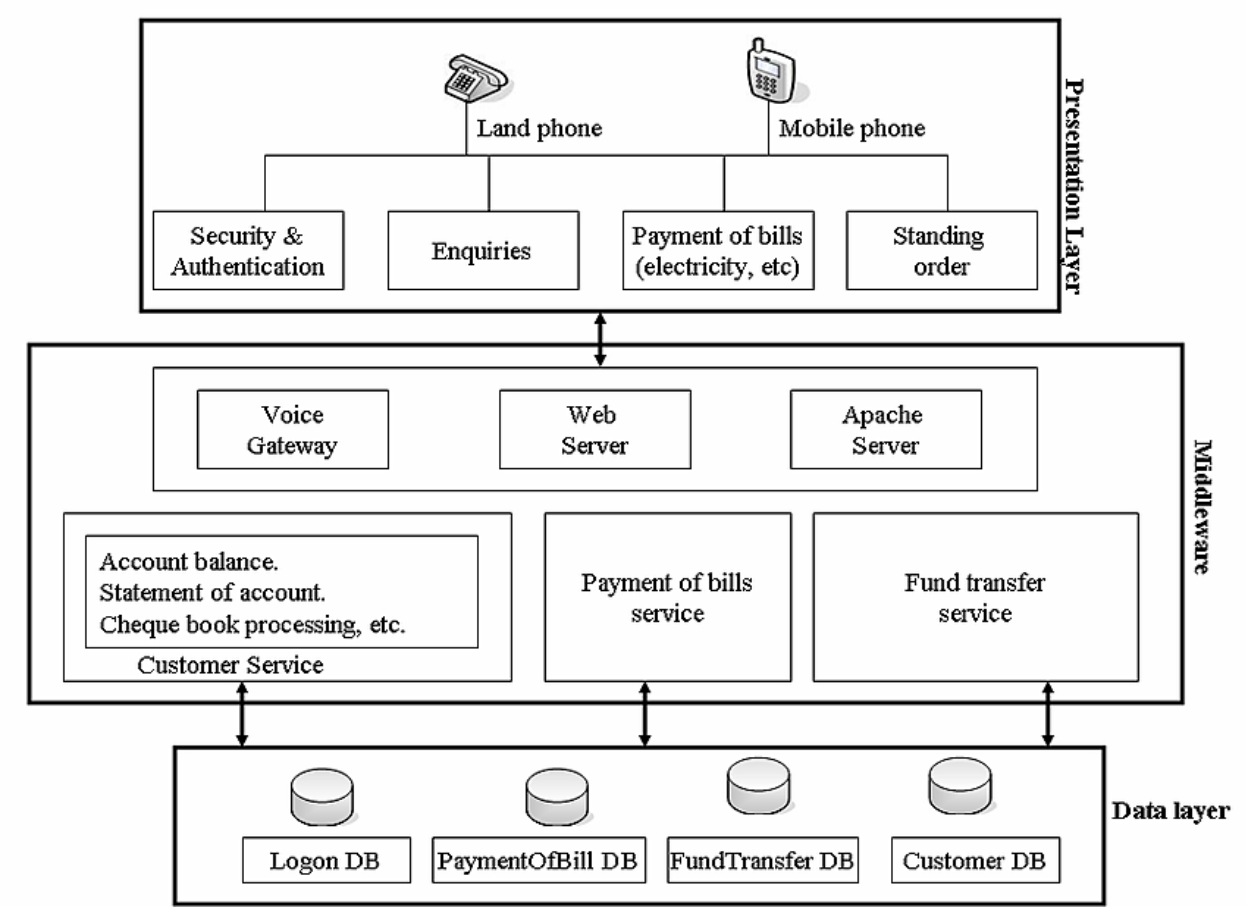
5.2 SOLUTION & TECHNICAL ARCHITECTURE

SOLUTION ARCHITECTURE:





TECHNICAL ARCHITECTURE:



5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
Customer (Mobile user)	Registration	USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
Customer (Mobile user)	Registration	USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
Customer (Mobile user)	Registration	USN-4	As a user, I can register for the application through Gmail	I can register & access the dashboard with Gmail Login	Medium	Sprint-1
Customer (Mobile user)	Login	USN-5	As a user, I can log into the application by entering email & password	I can log in & access the dashboard with email and password	High	Sprint-1
Customer (Mobile user)	Dashboard	USN-6	As a user, I can access the dashboard	I can access the dashboard	High	Sprint-1
Customer (Web user)	Registration	USN-7	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account/dashboard in web	High	Sprint-1
Customer (Web user)	Balance	USN-8	As a user, I want to check balance of my bank account	I can see the balances displayed	High	Sprint-1
Customer (Web user)	Transfer money	USN-9	As a user,I want to transfer money from my account to another bank account	I can transfer money from my account to another bank account	High	Sprint-1
Customer Care Executive	Solving query	USN-10	As a user, To continuously improve product knowledge and awareness of market trends and competitor products.	I can deal with customer issues and churning out an easy-to-follow solution.	High	Sprint-1
Administrator	Backup data	USN-11	As a Net Banking Administrator, I want to have the customer's data backed up so that I can restore it any time in case of issues	I can deal with customer's backup data	High	Sprint-1

6.PROJECT PLANNING & SCHEDULING
6.1 SPRINT PLANNING & ESTIMATION

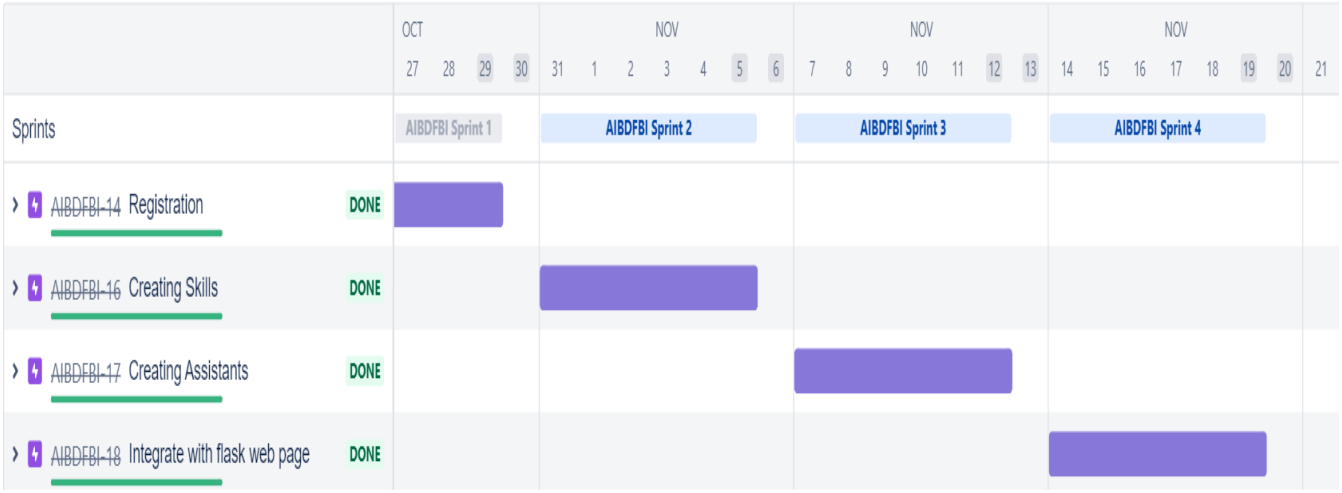
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Create IBM Service	USN-1	As a user, I can see a Watson Assistant.	1	High	Vasumithra S Priyanka G
Sprint-1	Chatbot Skills Creation	USN-2	As a user, I will see the Chatbot having banking-related skills.	1	High	Vasumithra S Priyanka G
Sprint-2	Creating Saving Account Action	USN-3	As a user, I can converse with the chatbot regarding saving account-related queries.	2	Medium	Vasumithra S Priyanka G
Sprint-2	Creating Current Account Action	USN-4	As a user, I can converse with the chatbot regarding current account-related queries.	2	Medium	Vasumithra S Priyanka G
Sprint-3	Creating Loan Account Action	USN-5	As a user, I can converse with the chatbot regarding loan account-related queries.	2	High	Vasumithra S Priyanka G

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-3	Creating General Query Action	USN-6	As a user, I can converse with the chatbot regarding general queries.	2	Medium	Vasumithra S Priyanka G
Sprint-3	Creating Net Banking Action	USN-7	As a user, I can converse with the chatbot regarding net banking-related queries.	2	High	Vasumithra S Priyanka G
Sprint-4	Creating Assistant & Integrate With Flask Web Page (Build Python Code)	USN-8	As a user, I can see a flask web page for bank.	1	Low	Vasumithra S Priyanka G
Sprint-4	Build HTML Code	USN-9	As a user, I can web pages integrated with a chatbot.	1	Medium	Vasumithra S Priyanka G
Sprint-4	Run The Application	USN-10	As a user, I can communicate with the chatbot24*7.	1	Low	Vasumithra S Priyanka G

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	26 Oct 2022
Sprint-2	20	6 Days	27 Oct 2022	05 Nov 2022	20	29 Oct 2022
Sprint-3	20	6 Days	29 Nov 2022	12 Nov 2022	20	01 Nov 2022
Sprint-4	20	6 Days	02 Nov 2022	19 Nov 2022	20	04 Nov 2022

6.3 REPORTS FROM JIRA



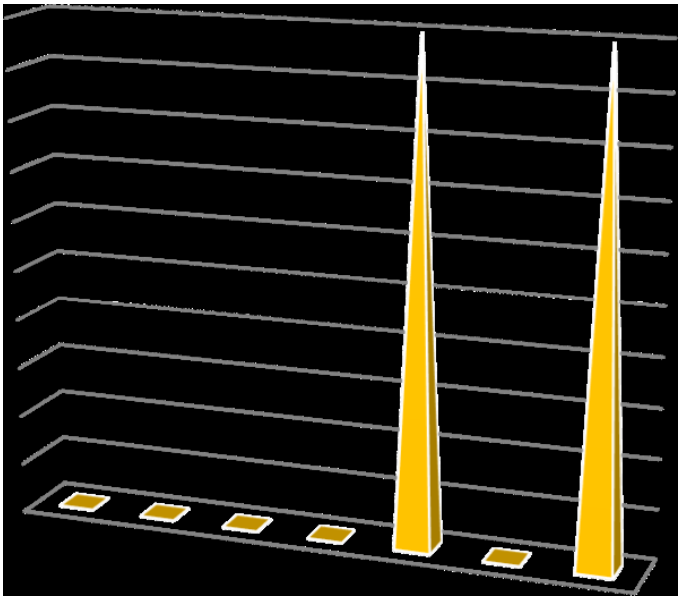
VELOCITY:

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

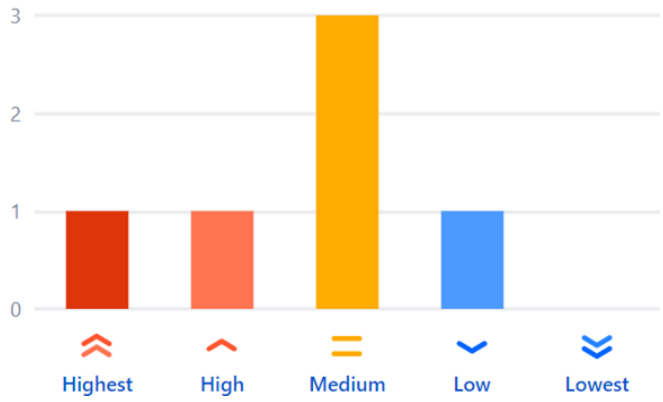
$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

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.



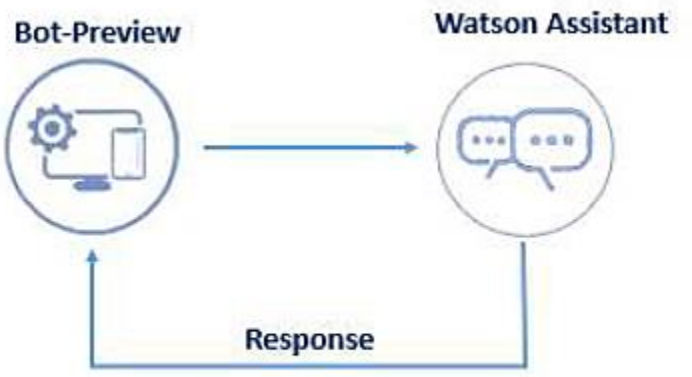
PRIORITY BREAKDOWN:



7.CODING & SOLUTIONING
THEORETICAL ANALYSIS:
Services Used:

- IBM Watson Assistant

Technical Architecture:



Hardware / Software designing:

To complete this project, you should have the following software and packages.

Software:

➢ Visual studio code

➢ IBM Watson studio

Packages:

➢ Flask

FLOWCHART:

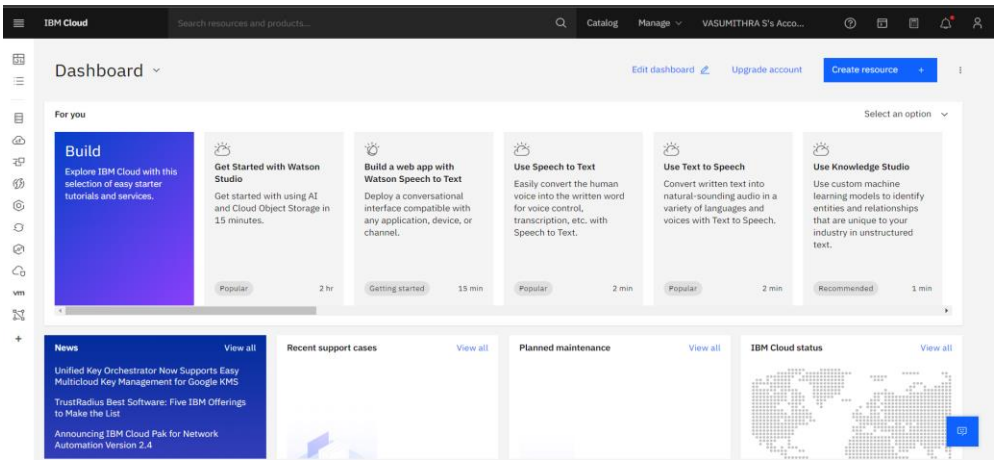
- Create IBM Services.
- Creating skills & Assistant for Chatbot.
- Creating Savings account action.
- Creating Current account action.
- Creating Loan account action.
- Creating a general query action.
- Creating a Net banking action.
- Create HTML web page.
- Integrate the Watson Assistant with Web Page.

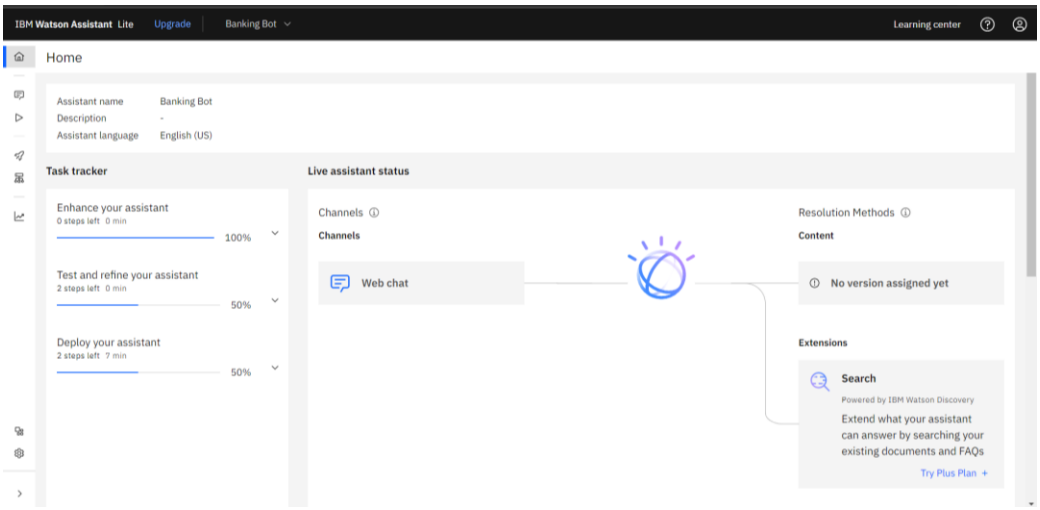
SUMMARY:

Create IBM Service:

In this activity, you will be creating the Necessary IBM service. The following are the service that you have to create.

- Watson Assistant

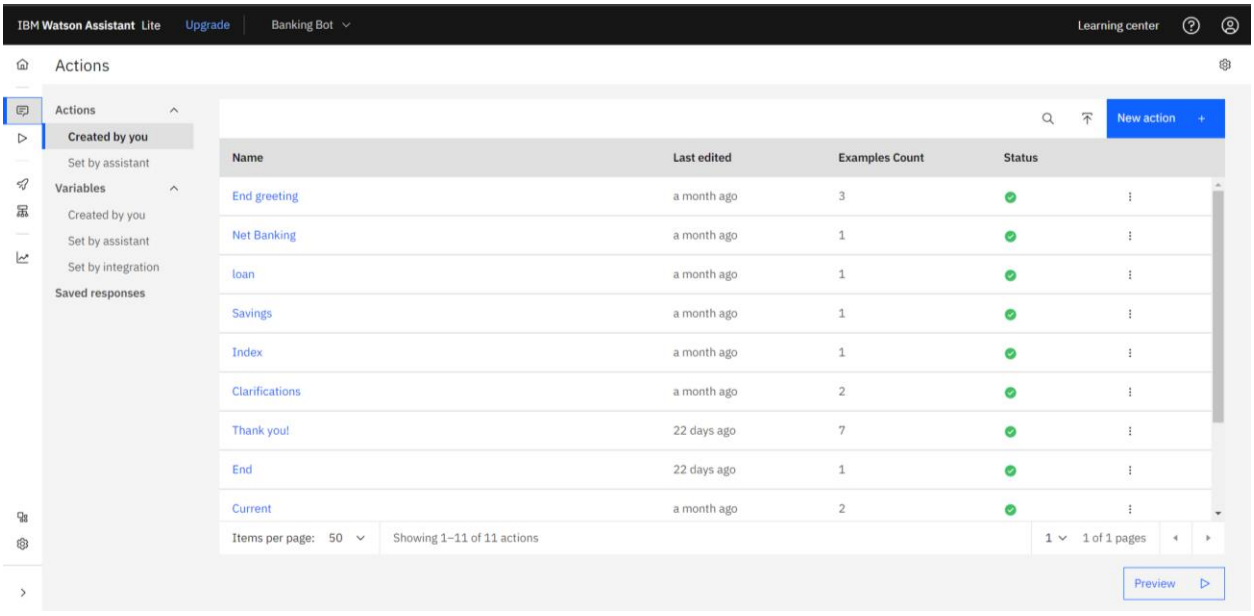


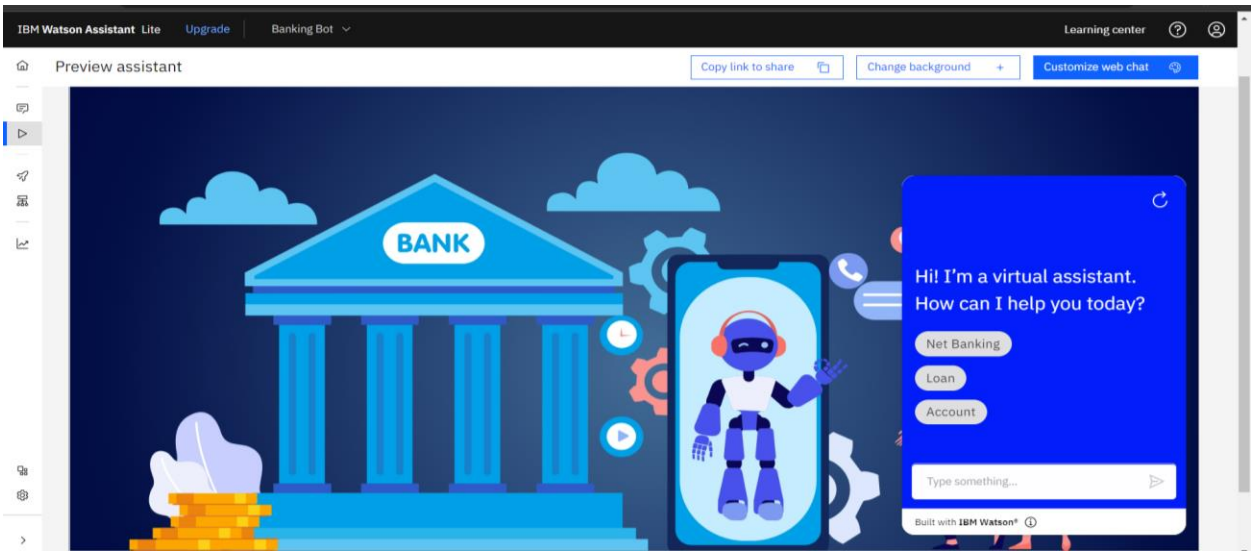


Creating Skills & Assistant For Chatbot:

Skills are nothing but actions and steps. Steps are the subset of actions where conversations are built and Assistant is used to integrate skills.

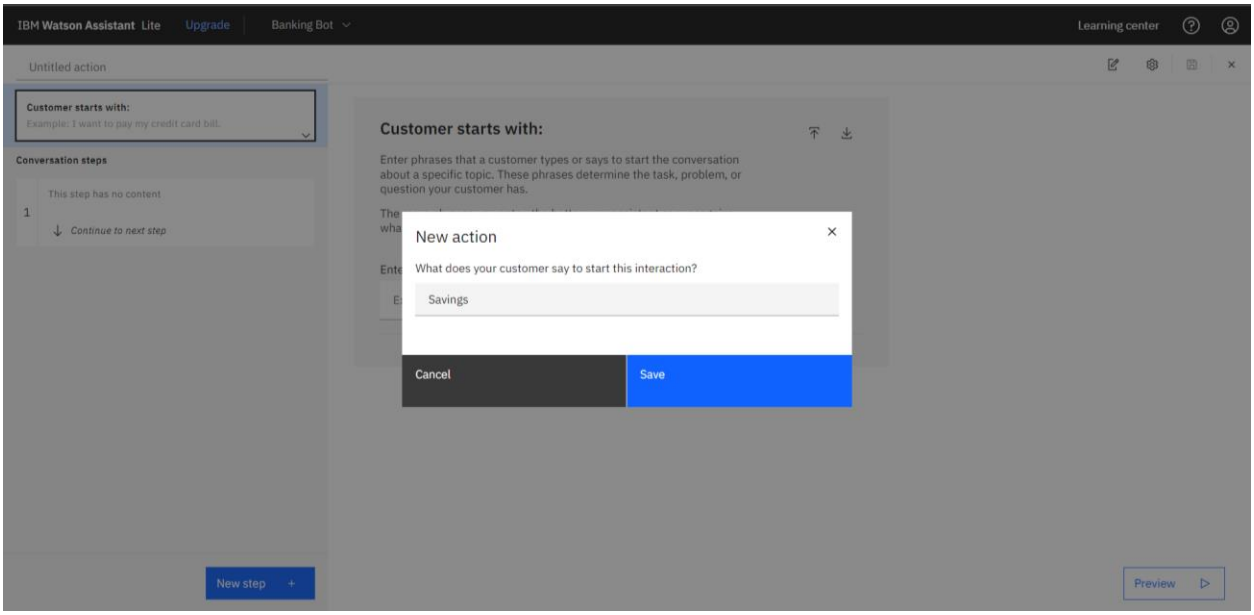
A default template chatbot is created. Need to add actions.



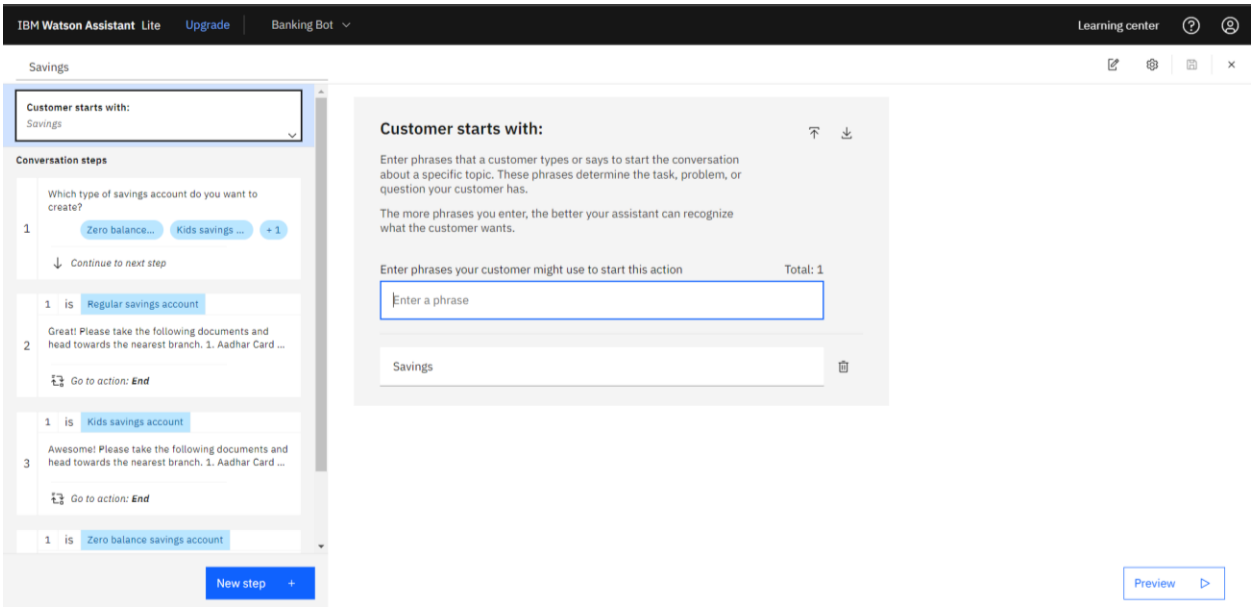


Creating Saving Account Action

Create a saving account in IBM Watson. Create new Action **Saving.**

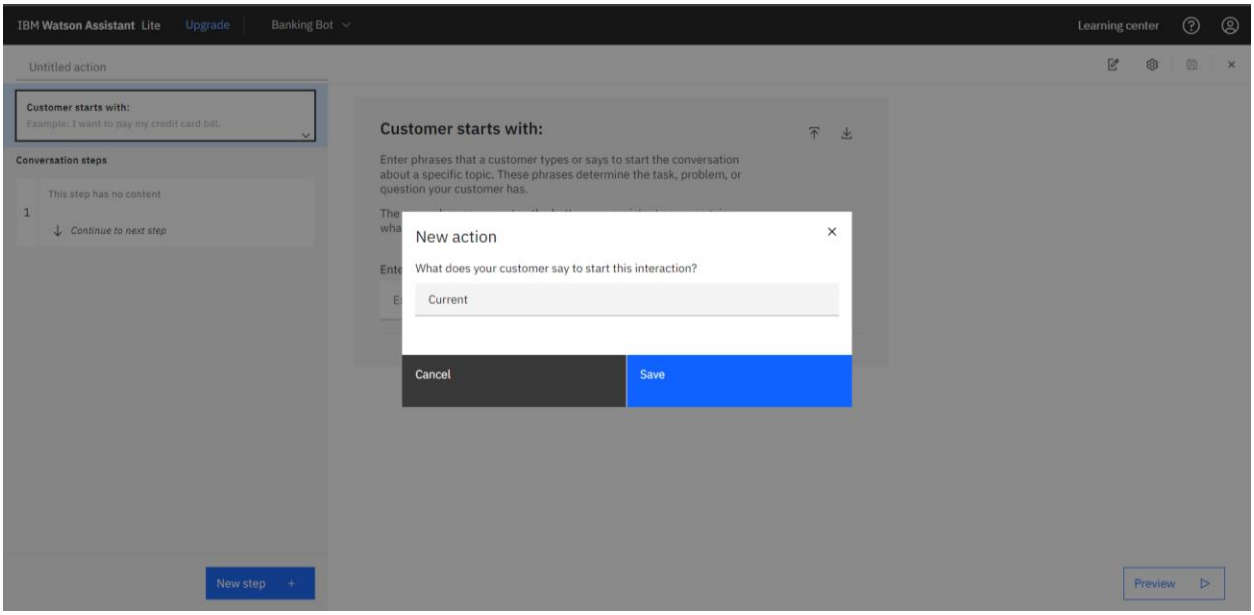


Add steps in savings action.

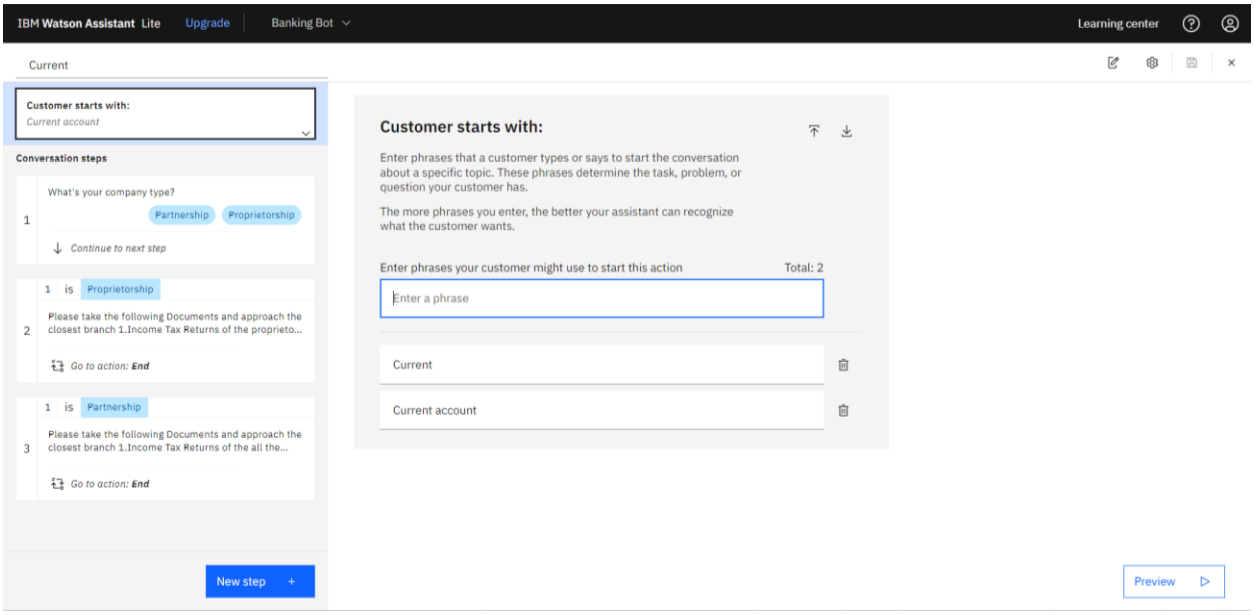


Creating Current Account Action

Create a new Action **Current** for the current account action.

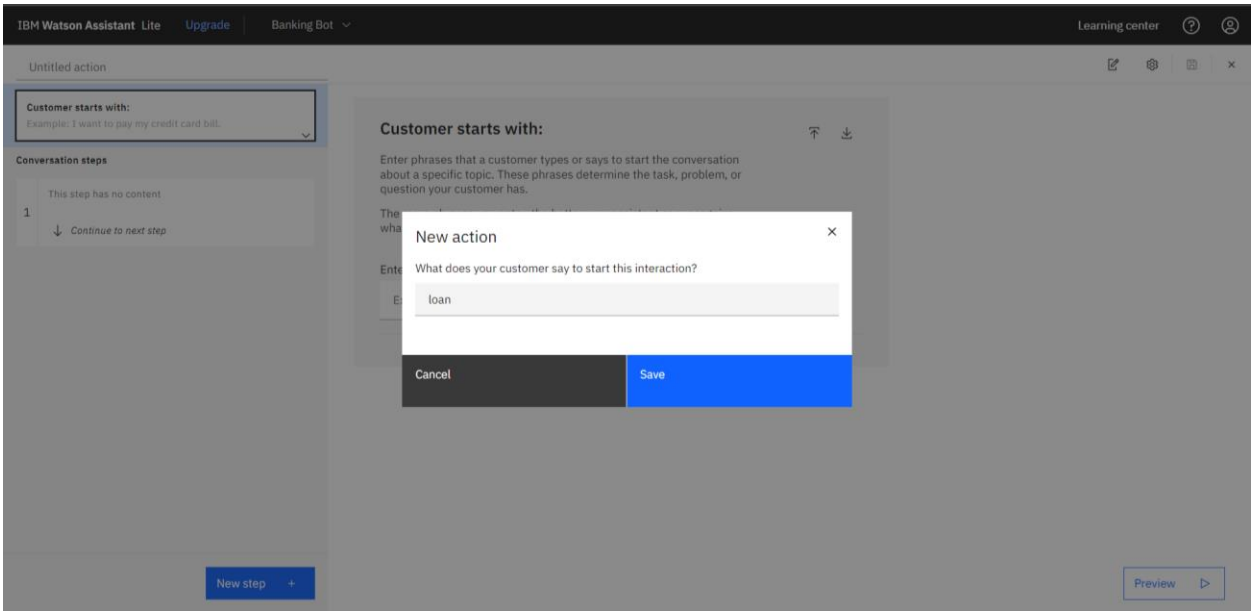


Add steps in current action.

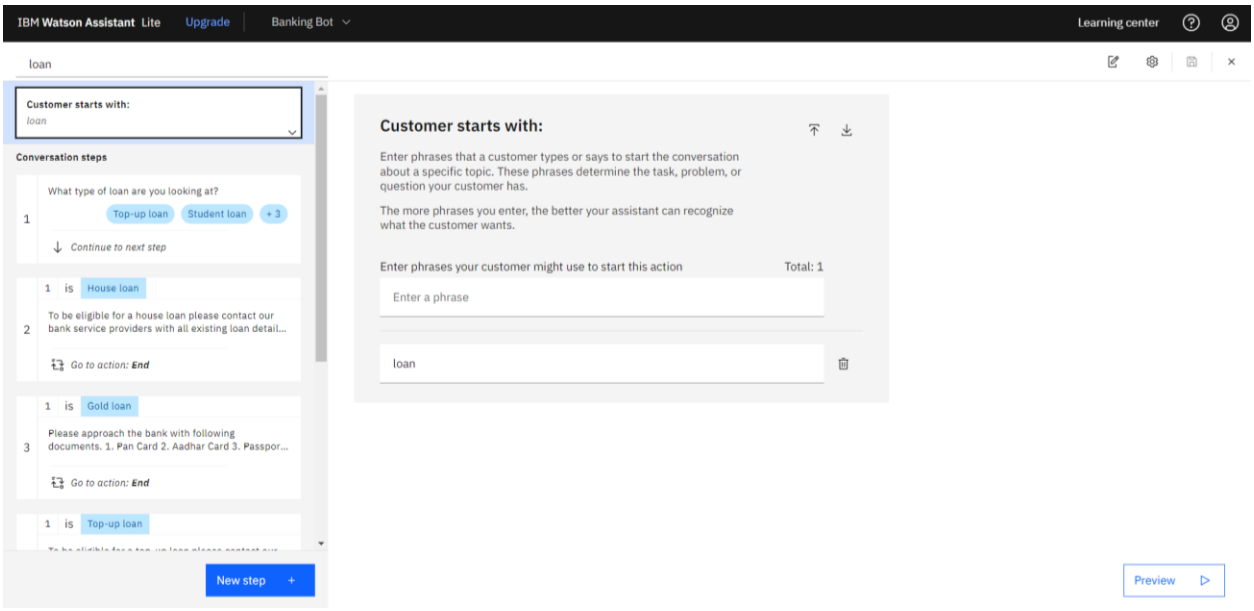


Creating Loan Account Action

Loan action is created with the necessary steps.

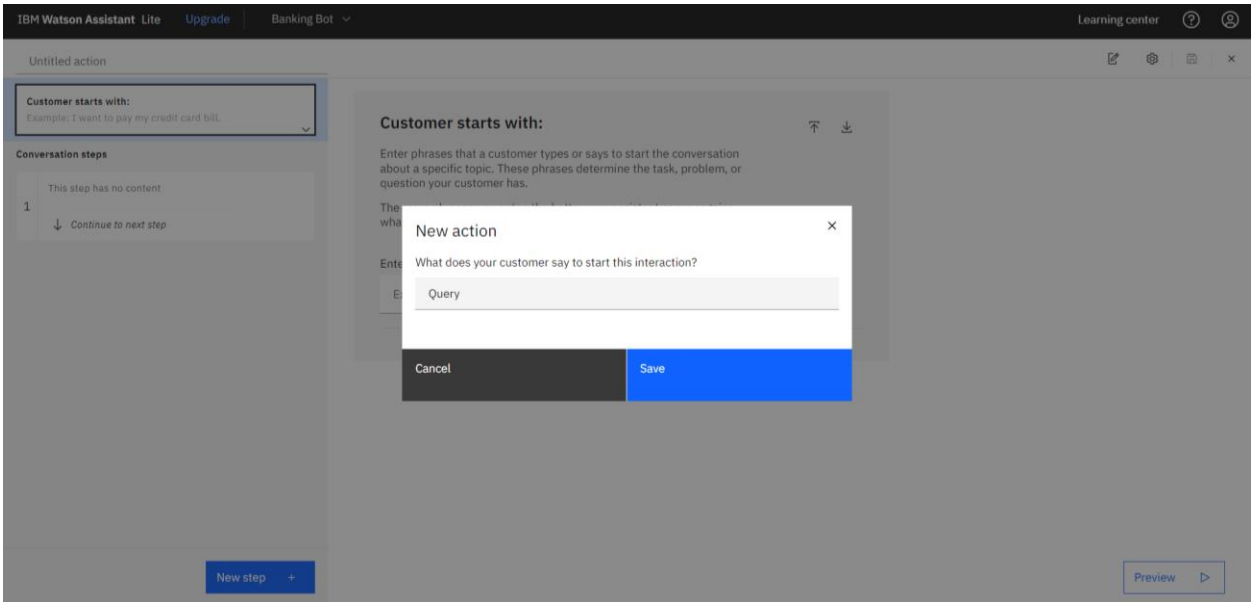


Add steps in loan action.

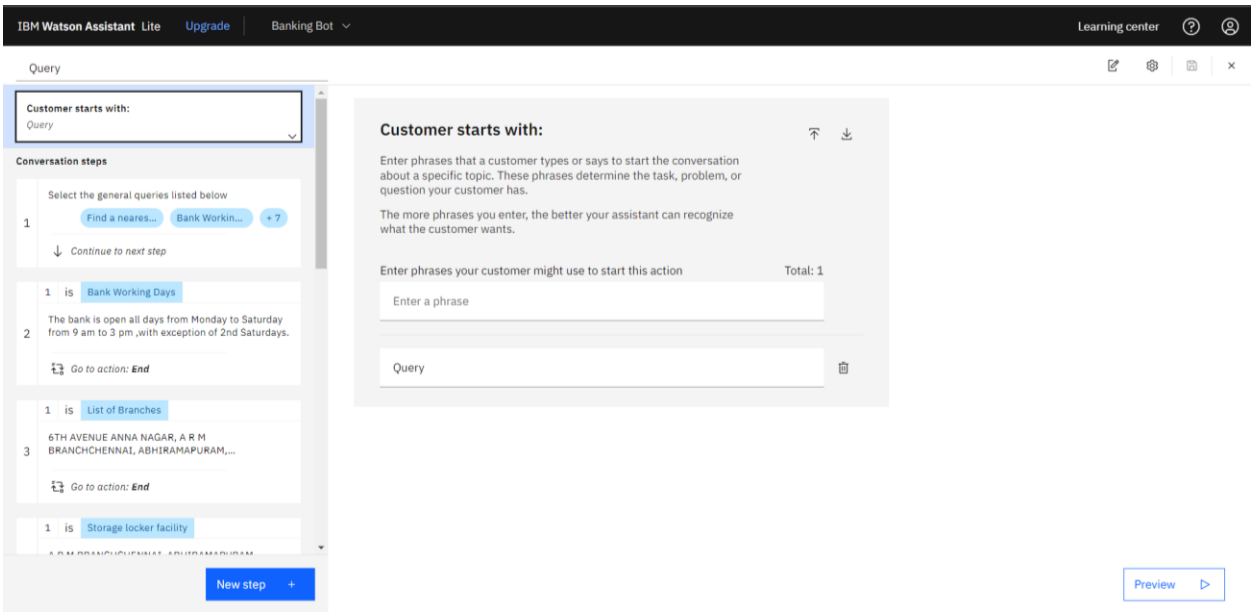


Creating General Query Action

General **query** action is created with the necessary steps.

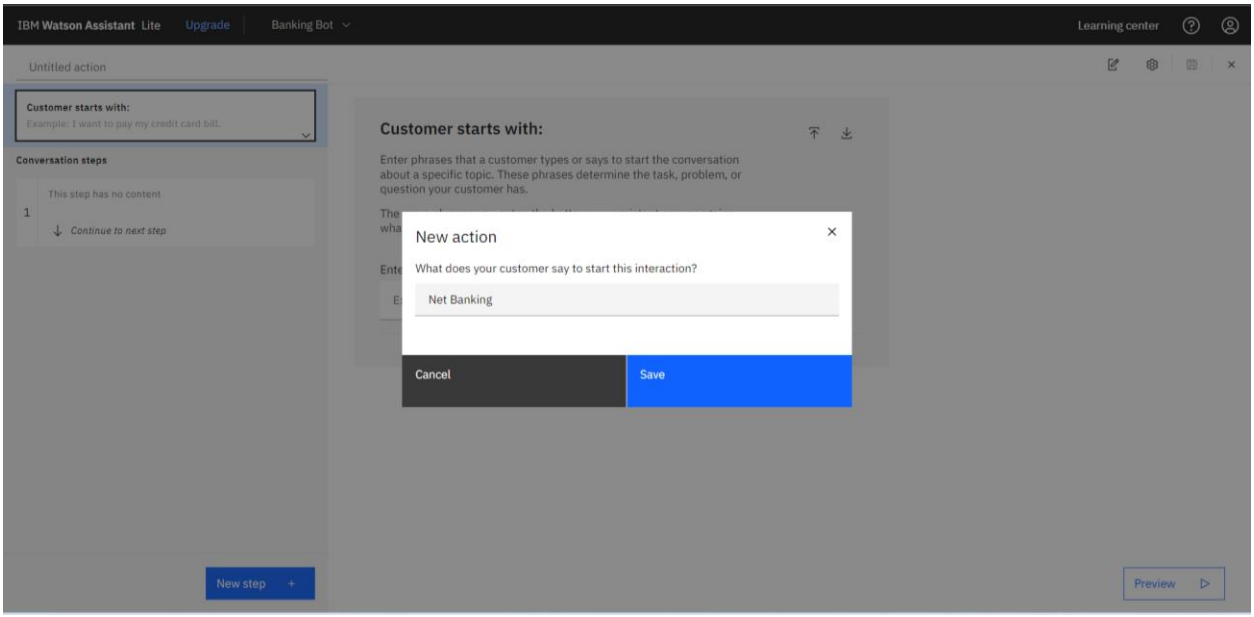


Add steps in Query action.

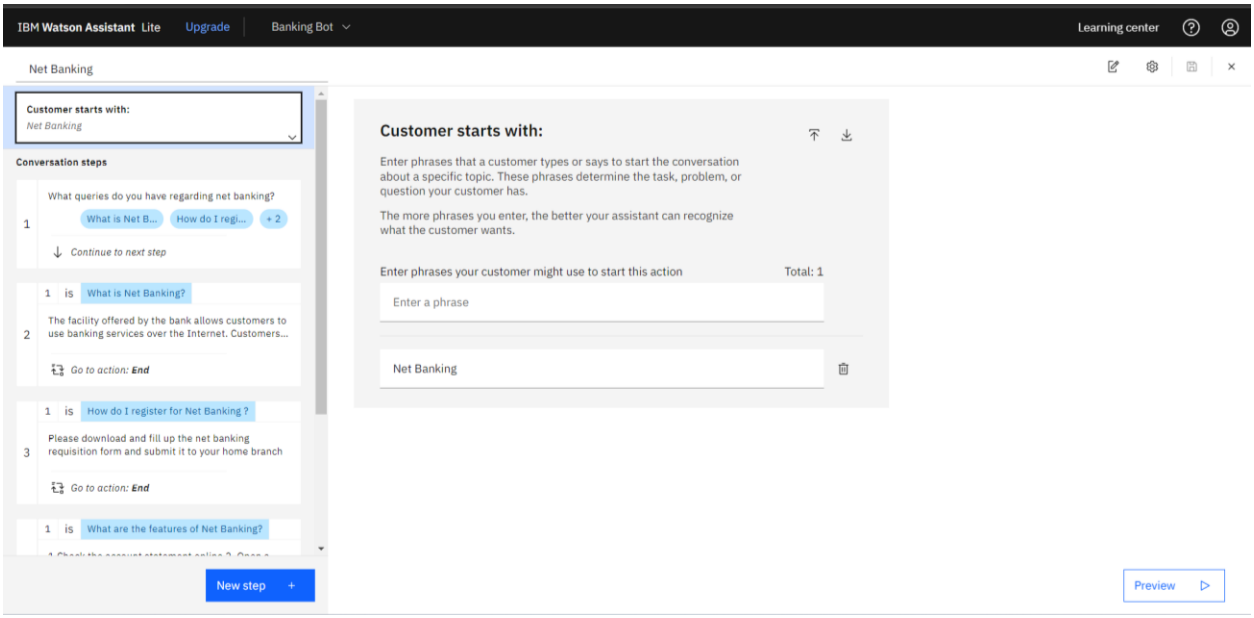


Creating Net Banking Action

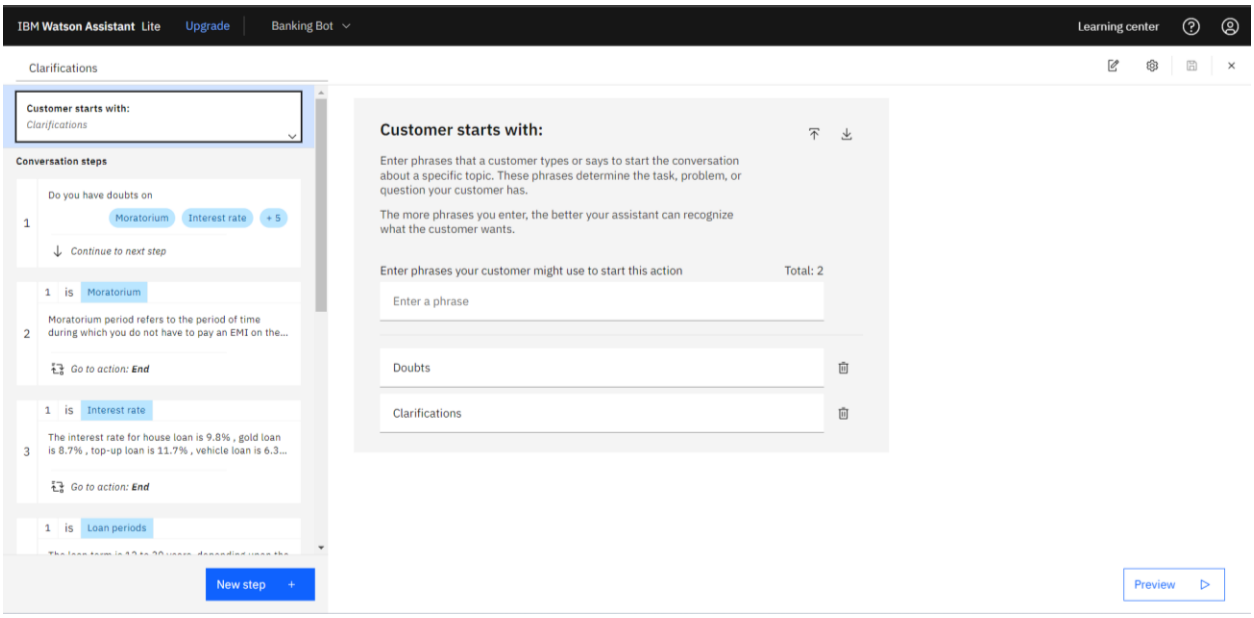
Net Banking action is created with the necessary steps.

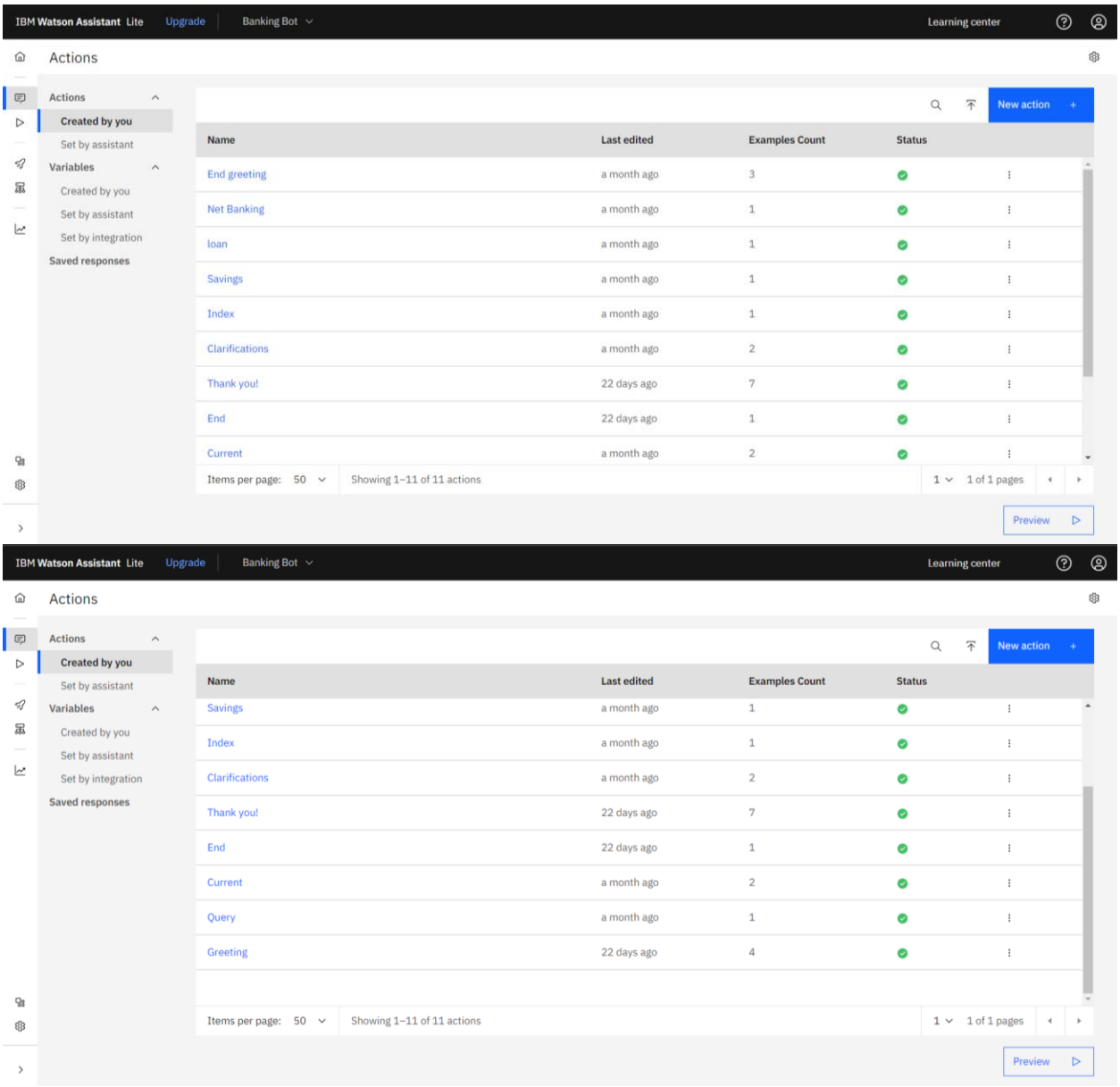


Add steps in Net Banking action.



In addition to this greeting, end greeting ,index ,end and thank you actions are also created.





Creating Assistant & Integrate With Flask Web Page

Creating a banking bot in this activity that has the following capabilities.

1. The Bot should be able to guide a customer to create a bank account.
2. The Bot should be able to answer loan queries.
3. The Bot should be able to answer general banking queries.

4. The Bot should be able to answer queries regarding net banking.
5. With the help of this bot, you can get all the required details related to banking.

Let us build our flask application which will be running in our local browser with a user interface.

In the flask application, users will interact with the chatbot, and based on the user queries they will get the outcomes.

Build Python Code

1: Importing Libraries

The first step is usually importing the libraries that will be needed in the program.

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

Importing the flask module into the project is mandatory. An object of the Flask class is our WSGI application. Flask constructor takes the name of the current module (__name__).

2: Creating our flask application and loading

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

3: Routing to the Html Page

Here, the declared constructor is used to route to the HTML page created earlier.

The ‘/’ route is bound with the bot function. Hence, when the home page of a web server is opened in the browser, the HTML page will be rendered.

```
@app.route('/')
def bot():
    return render_template('chatbot.html')
```

Main Function

This is used to run the application in localhost.

```
if __name__ == '__main__':
    app.run()
```

Build HTML Code

• We use HTML to create the front-end part of the web page.
• Here, we have created 1 HTML page-Chatbot.html
• Chatbot.html displays the home page which integrates with Watson Assistant.
• A simple HTML page is created. Auto-generated source code from IBM Watson Assistants is copied and pasted inside the body tag

Run The Application

• Open the anaconda prompt from the start menu.
• Navigate to the folder where your app.py resides.
• Now type the “python app.py” command.
• It will show the local host where your app is running on http://127.0.0.1.5000/

• Copy that localhost URL and open that URL in the browser. It does navigate me to where you can view your web page.

Source Code:

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="utf-8">
<meta content="width=device-width, initial-scale=1.0" name="viewport">
<title>Banking Bot</title>
<meta content="" name="description">
<meta content="" name="keywords">
<!-- Favicons -->
<link href="assets/img/favicon.png" rel="icon">
<link href="assets/img/apple-touch-icon.png" rel="apple-touch-icon">
<!-- Google Fonts -->
<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">
<!-- Vendor CSS Files -->
<link href="assets/vendor/aos/aos.css" rel="stylesheet">
<link href="assets/vendor/bootstrap/css/bootstrap.min.css" rel="stylesheet">
<link href="assets/vendor/bootstrap-icons/bootstrap-icons.css" rel="stylesheet">
<link href="assets/vendor/boxicons/css/boxicons.min.css" rel="stylesheet">
```

```
<link href="assets/vendor/glightbox/css/glightbox.min.css"
rel="stylesheet">
<link href="assets/vendor/remixicon/remixicon.css"
rel="stylesheet">
<link href="assets/vendor/swiper/swiper-bundle.min.css"
rel="stylesheet">
<!-- Template Main CSS File -->
<link href="assets/css/style.css" rel="stylesheet">
</head>
<body>
<script>
  window.watsonAssistantChatOptions = {
    integrationID: "2d33609b-c061-4015-9c69-6993e984734c", //
The ID of this integration.
    region: "us-south", // The region your integration is hosted in.
    serviceInstanceID: "d06762b6-396b-4236-8512-
e118333e6832", // 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>
<!-- ======= Header ======= -->
<header id="header" class="fixed-top ">
```

```
<div class="container d-flex align-items-center justify-content-lg-between">
<h1 class="logo me-auto me-lg-0"><a href="index.html">Bot<span>.</span></a></h1>
<!-- Uncomment below if you prefer to use an image logo -->
<nav id="navbar" class="navbar order-last order-lg-0">
<ul>
<li><a class="nav-link scrollto active" href="#hero">Home</a></li>
<li><a class="nav-link scrollto" href="#about">About</a></li>
<li><a class="nav-link scrollto" href="#services">Services</a></li>
<li><a class="nav-link scrollto" href="#team">Team</a></li>
<li><a class="nav-link scrollto" href="#contact">Contact</a></li>
</ul>
<i class="bi bi-list mobile-nav-toggle"></i>
</nav><!-- .navbar -->
<a href="#about" class="get-started-btn scrollto">Get Started</a>
</div>
</header><!-- End Header -->
<!-- ======= Hero Section ======= -->
<section id="hero" class="d-flex align-items-center justify-content-center">
<div class="container" data-aos="fade-up">
<div class="row justify-content-center" data-aos="fade-up" data-aos-delay="150">
<div class="col-xl-6 col-lg-8">
<h1>AI Based Discourse for Banking Industry<span>.</span></h1>
```

<h2>Chatbots for banking and finance operations.</h2>

<h3>Loan</h3>

<h3>Net-Banking</h3>

<h3>24*7 </h3>

<h3>Locker</h3>

```
<i class="ri-database-2-line"></i>
<h3><a href="">Data Security</a></h3>
</div>
</div>
</div>
</div>
</section><!-- End Hero -->
<div id="preloader"></div>
<a href="#" class="back-to-top d-flex align-items-center justify-content-center"><i class="bi biarrow-up-short"></i></a>
<!-- Vendor JS Files -->
<script src="assets/vendor/purecounter/purecounter_vanilla.js"></script>
<script src="assets/vendor/aos/aos.js"></script>
<script src="assets/vendor/bootstrap/js/bootstrap.bundle.min.js"></script>
<script src="assets/vendor/glightbox/js/glightbox.min.js"></script>
<script src="assets/vendor/isotope-layout/isotope.pkgd.min.js"></script>
<script src="assets/vendor/swiper/swiper-bundle.min.js"></script>
<script src="assets/vendor/php-email-form/validate.js"></script>
<script src="assets/js/main.js"></script>
</body>
</html>
```

8.TESTING
8.1 TEST CASES
8.2 USER ACCEPTANCE TESTING

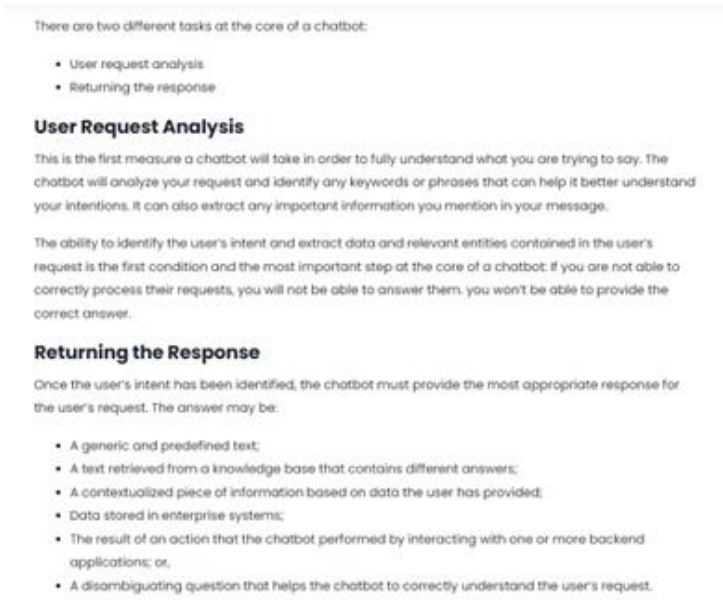
Defect Analysis

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	1	0	0	0	1
Duplicate	2	2	0	1	4
External	2	3	0	2	6
Fixed	1	5	3	2	12
Not Reproduced	0	0	0	0	0
Skipped	0	0	0	1	0
Won't Fix	0	0	0	0	1
Totals	6	10	3	6	24

Test Case Analysis

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

9.RESULTS.
9.1 PERFORMANCE METRICS

S.No.	Parameter	Values	Screenshot
1.	Model Summary	-	

There are two different tasks at the core of a chatbot:

- User request analysis
- Returning the response

User Request Analysis

This is the first measure a chatbot will take in order to fully understand what you are trying to say. The chatbot will analyze your request and identify any keywords or phrases that can help it better understand your intentions. It can also extract any important information you mention in your message.

The ability to identify the user's intent and extract data and relevant entities contained in the user's request is the first condition and the most important step at the core of a chatbot: if you are not able to correctly process their requests, you will not be able to answer them, you won't be able to provide the correct answer.

Returning the Response

Once the user's intent has been identified, the chatbot must provide the most appropriate response for the user's request. The answer may be:

- A generic and predefined text;
- A text retrieved from a knowledge base that contains different answers;
- A contextualized piece of information based on data the user has provided;
- Data stored in enterprise systems;
- The result of an action that the chatbot performed by interacting with one or more backend applications; or,
- A disambiguating question that helps the chatbot to correctly understand the user's request.

2.	Accuracy	Training Accuracy = 95.5 Validation Accuracy= 0.8045	

10.ADVANTAGES & DISADVANTAGES:
ADVANTAGES:

- Transforms the member experience.
- Always available to interact with your members, enabling them to get the personalized information they need, when and where they need it.
- Watson is **a computer running software called Deep QA, developed by IBM Research**.

- The broader goal of Watson was to create a new generation of technology that can find answers in unstructured data more effectively than standard search technology.
- **Helps lower cost of member interactions**
- Supports your goals to deflect calls to lower-cost, self-service channels, reduce agent training, call handling time and reduce average cost per call.
- In the financial sector, Watson use is typically geared toward its question and answer capabilities. By not only answering questions, but also analyse them as well, Watson can help give financial guidance and help manage financial risk.

DISADVANTAGES:

☆ Seen as disruptive applied science

☆ Doesn't process structured data directly

☆ High switching costs and Maintenance

☆ Takes time to integrate Watson and it’s services into a company.

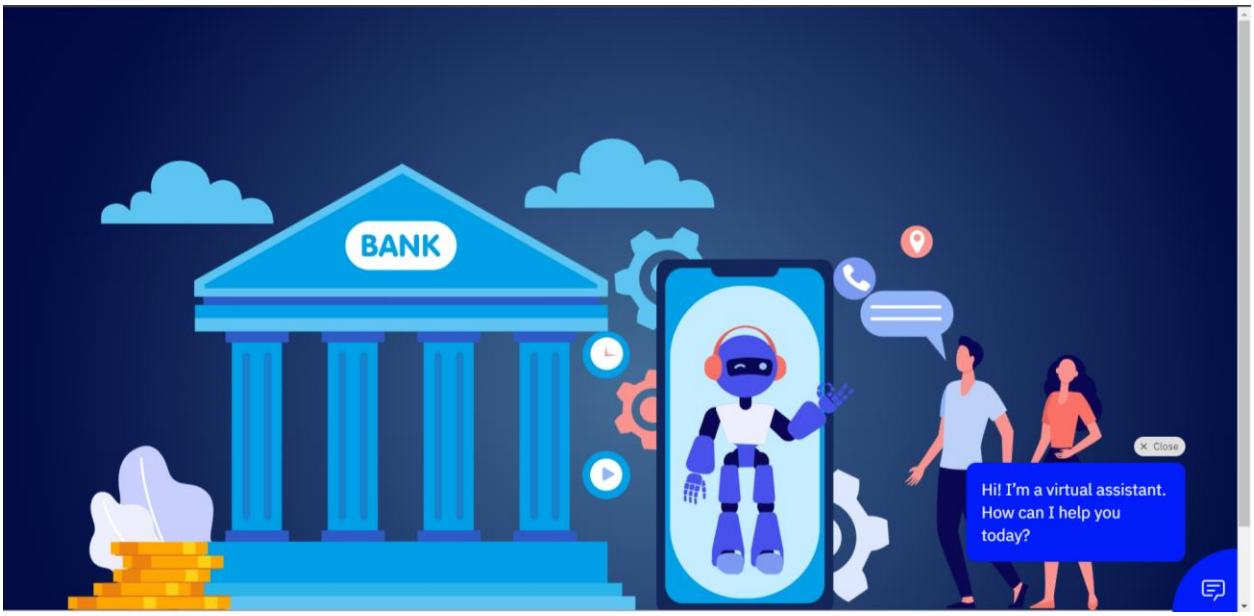
☆ Targeting towards bigger organizations that can afford Watson.

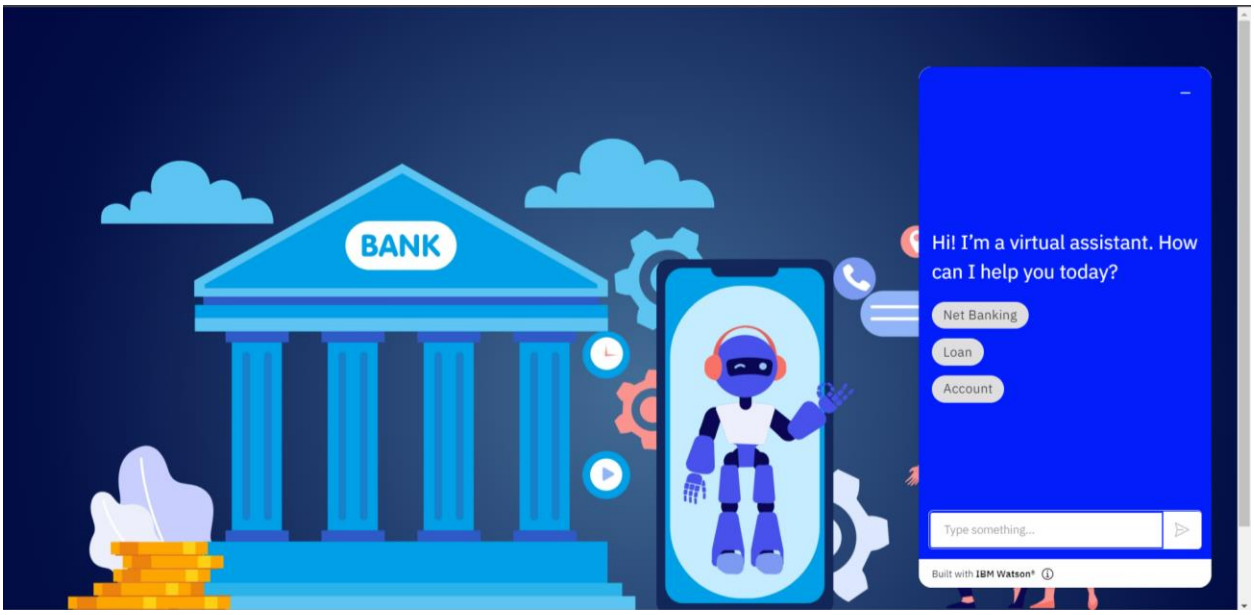
☆ AI for the financial industry has a relevant high cost too. It may not be possible for all the finance companies to go for this big expensive model initially.

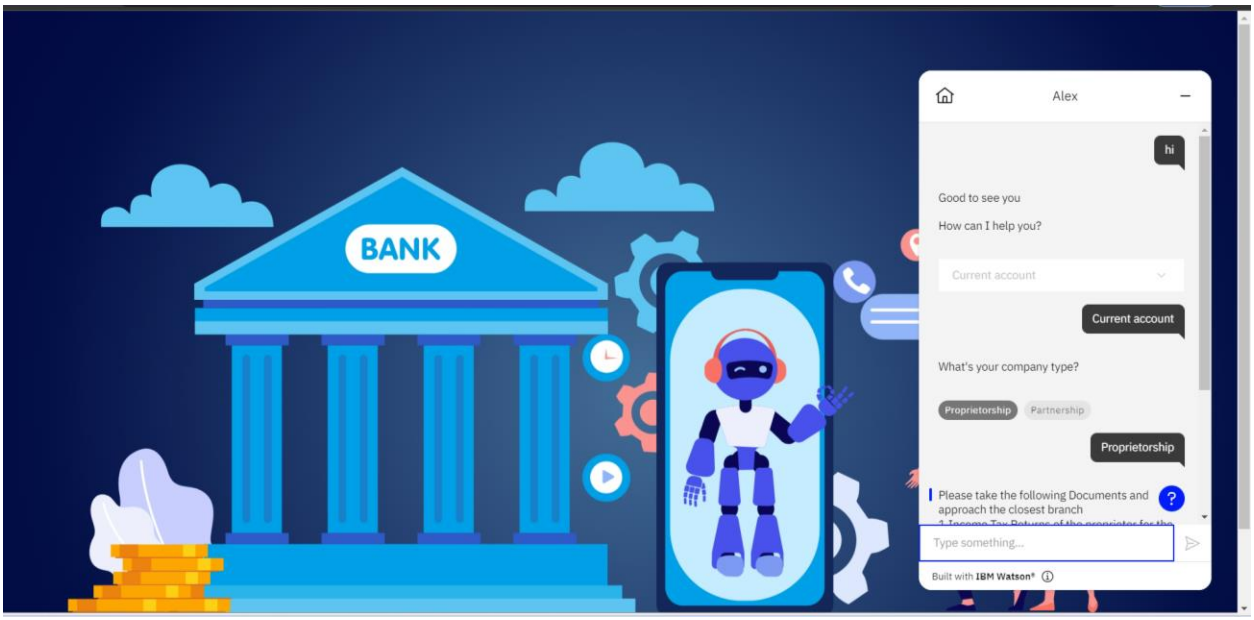
☆ An improper algorithm or command can bring unnecessary errors and wrong results.

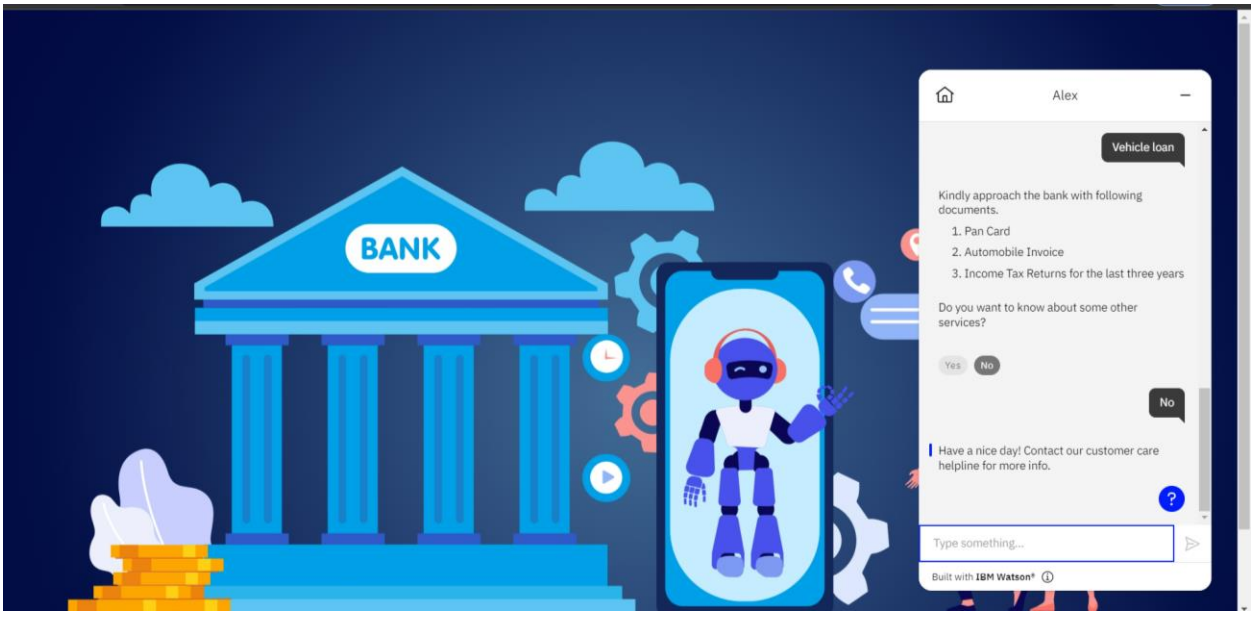
☆ So, proper implementation of the algorithm is important.

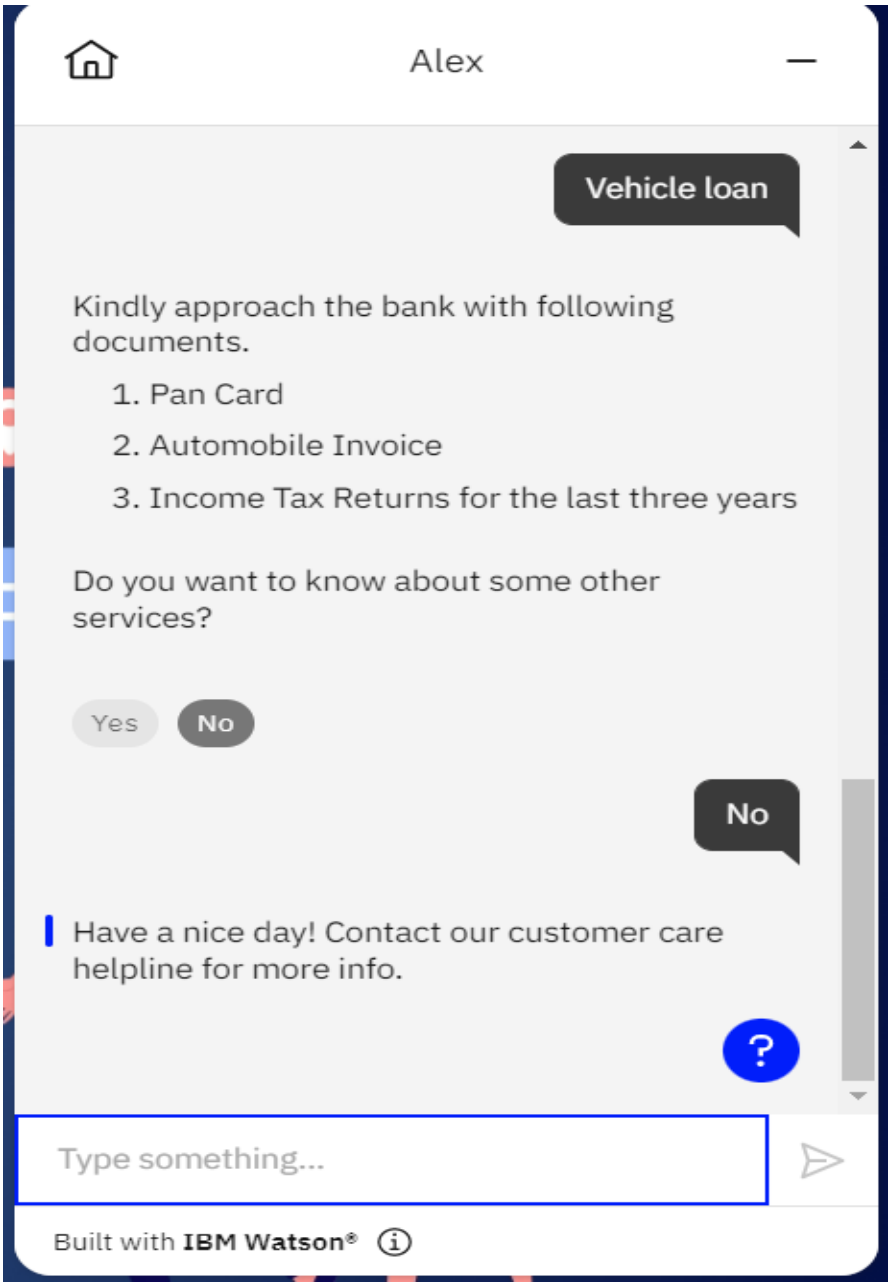
11.CONCLUSION






BANK
Alex
hi
Good to see you
How can I help you?
Current account
Current account
What's your company type?
Proprietorship
Partnership
Proprietorship
Please take the following Documents and approach the closest branch
Type something...
Built with IBM Watson®


BANK
Alex
Vehicle loan
Kindly approach the bank with following documents.
1. Pan Card
2. Automobile Invoice
3. Income Tax Returns for the last three years
Do you want to know about some other services?
Yes
No
No
Have a nice day! Contact our customer care helpline for more info.
Type something...
Built with IBM Watson®


Alex
Vehicle loan
Kindly approach the bank with following documents.
1. Pan Card
2. Automobile Invoice
3. Income Tax Returns for the last three years
Do you want to know about some other services?
Yes
No
No
Have a nice day! Contact our customer care helpline for more info.
Type something...
Built with IBM Watson®

BANKING CHATBOT:
PREVIEW OF CHATBOT:

https://web-chat.global.assistant.watson.appdomain.cloud/preview.html?backgroundImageURL=https%3A%2F%2Fus-south.assistant.watson.cloud.ibm.com%2Fpublic%2Fimages%2Fupx-d06762b6-396b-4236-8512-e118333e6832%3A%3A495bdb54-8670-415a-a8aa-5480cc1528ef&integrationID=2d33609b-c061-4015-9c69-6993e984734c&region=us-south&serviceInstanceID=d06762b6-396b-4236-8512-e118333e6832

12.FUTURE SCOPE

- 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 are changing the way businesses communicate and understand their customers. With AI, chatbots will have the ability to deliver a more personalized customer experience. It's also saving companies money through customer service, internal processes, and marketing efforts.
- AI chatbots will likely become more popular in human resources departments worldwide. This is a straightforward shift from customer service to employee service bots. HR versions are also likely to become popular soon. They may

gain ground in employee training, IT help and administrative assistance functions.

13.APPENDIX

SOURCE CODE:

https://github.com/IBM-EPBL/IBM-Project-6882-1658841713/tree/main/AI%20BASED%20DISCOURSE%20FOR%20BANKING%20INDUSTRY/Final%20deliverables

GITHUB LINK:

https://github.com/IBM-EPBL/IBM-Project-6882-1658841713

PROJECT DEMO LINK:

https://drive.google.com/file/d/1nVo7wOH0o1Zyu64f8zQukRVtCJreli_W/view?usp=share_link