

PROJECT REPORT

AI BASED DISCOURSE FOR BANKING INDUSTRY

Team ID: PNT2022TMID28540

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1 INTRODUCTION:

1.1 Project Overview:

- The modern market and technology advancements drive industries to change and modernise their procedures. One of the most sophisticated industries, the banking sector is constantly striving for new technical advancements to boost productivity.
- Complex net banking websites require you to navigate through numerous pages in order to find the information you need. When speaking with clients directly, bank employees deal with several unpleasant scenarios. Chatbots can be used to gracefully avoid such circumstances.
- According to a research by Salesforce, only 32% of organisations in the banking sector now employ AI chatbots, and 37% expect to do so within the next 18 months. This yields a prospective growth rate of 118%, demonstrating the industry's demand.
- When a user asks a question in natural language, a clever chatbot responds with the necessary information. This study intends to discuss the applicability of chatbots in the banking industry and investigate how chatbots may be created using banking-specific NLP approaches

1.2 Purpose:

- There are numerous questions because banking is a necessary service that people need and because it may be a perplexing and hard subject for many individuals. Since they are now primarily handled manually, either through face-to-face encounters with a banking professional or through a customer care service, answering them will require a large workforce and still result in lengthy wait times. Thus, an automated solution to the issue is required, which our chatbot can readily manage. A chatbot is cost-free, simple to use, and available anytime, anywhere. Additionally, it offers customers quick, accurate responses to their inquiries, thereby negating their requirement.

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.

- ✓ 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 Reference:

Paper 1:

Authors: Sen-Tarng Lai, Fang-Yie Leu, Jeng-Wei Lin

Year: 2019

Title: . A BANKING CHATBOT SECURITY CONTROL PROCEDURE FOR PROTECTING USER DATA SECURITY AND PRIVACY

Methodology: The rise of AI has prompted the money business to enter the intelligent money technology (FinTech). Chatbot with AI technologies is a vital member of FinTech. The money trade is actively introducing chatbot to boost the market competitive advantage. several banks and card issuers within the us have introduced or developed chatbots from 2017 to extend user convenience and assist business promotion of monetary establishments.

Paper 2:

Authors: : Martin Adam, Michael Wessel, Alexander Benlian

Year: 2020

Title: . AI-BASED CHATBOTS IN CUSTOMER SERVICE AND THEIR EFFECTS ON USER COMPLIANCE

Methodology: Communicating with clients through live chat interfaces has become associate progressively common suggests that to supply time period customer service in several e-commerce settings. Today, human chat service agents are oftentimes replaced by informal code agents or chatbots, that are systems designed to speak with human users by suggests that of language usually supported AI (AI).

Paper 3:

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.

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

[1].Mohamed Hussain Thowfeek,Et Al.,[2020],Drivers Of Artificial Intelligence In Banking Service Sectors. August 2020.

[2].Mehmet Ateş.,[2017],Artificial Intelligence In Banking - A Case Study About The Introduction Of A Virtual Assistant Into Customer Service. September 2017

[3].Praveen Kumar Donepudi.,[2017] Machine Learning And Artificial Intelligence In Banking July 2017

[4].Kamal Singh.,[2020]Banks Banking On Ai, November 2020

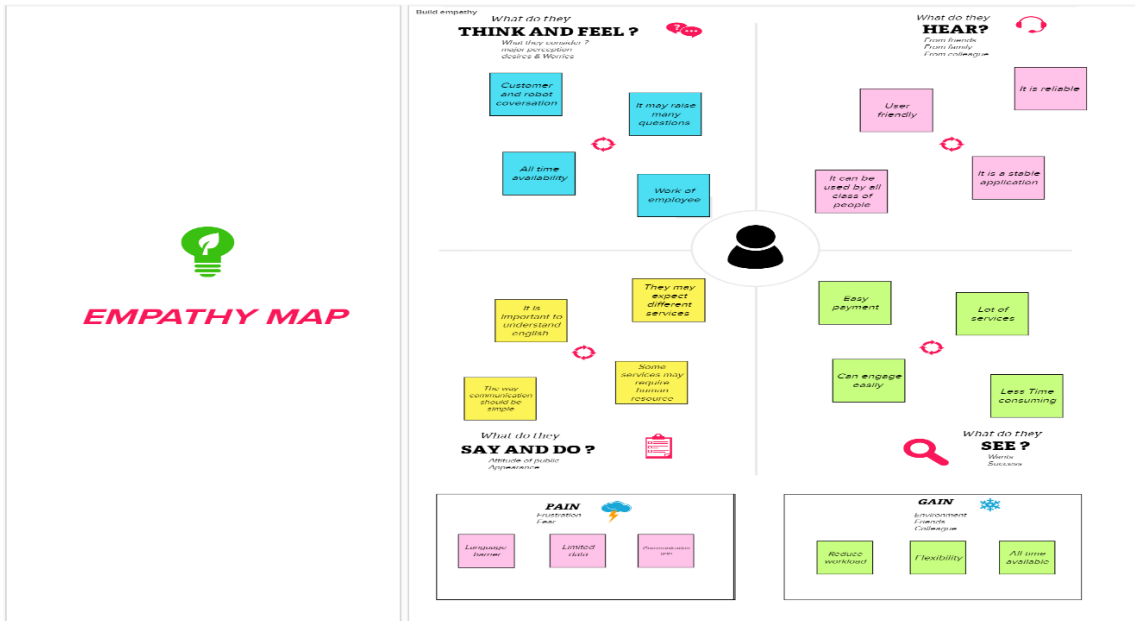
[5].Praveen Kumar Donepudi.,[2019] Automation And Machine Learning In Transforming The Financial Industry, December 2019.

2.3 Problem Statement definition:

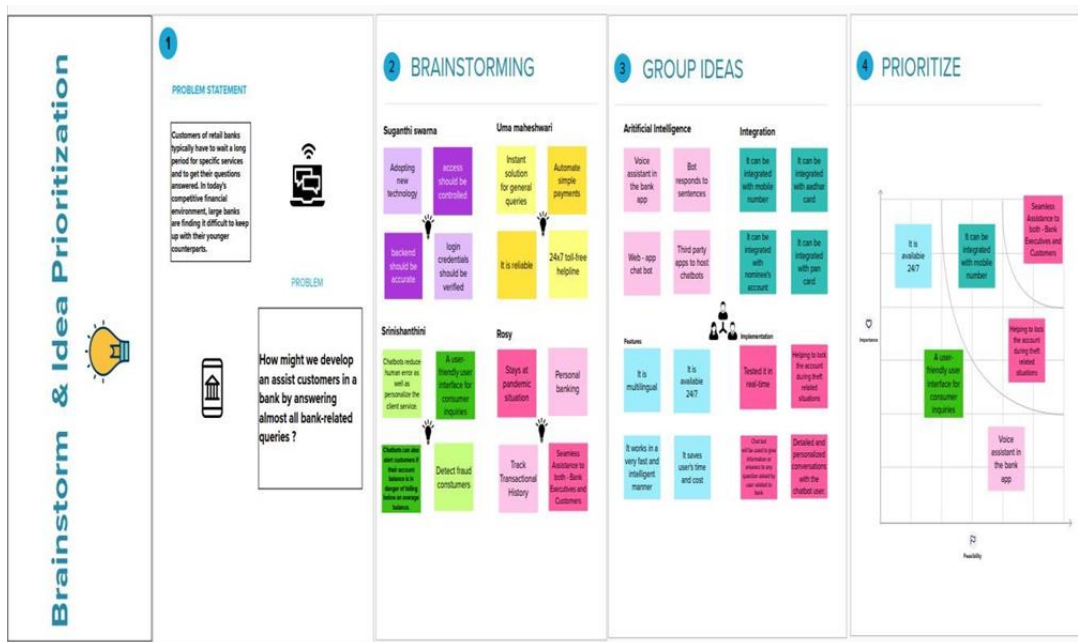
- ✓ Banking is one the crucial sectors, it deals with financial transactions which can be availed by everyone, but banks are not able to resolve the queries of customers at all times related to the products or services in a satisfactory way in turn hinders the customer satisfaction. In order to guide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

3 IDEATION AND PROPOSED SOLUTION:

3.1 Empathy Map Canvas



3.2 Ideation & Brainstorming



3.3 Proposed Solution:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	<p>To build an efficient AI based banking chatbot or banking assistant to effectively to curb out the following constraints:</p> <ul style="list-style-type: none"> Guiding customer on account creation, net banking, etc., Answering queries regarding financial and loan instantly.
2.	Idea / Solution description	<p>The following approaches are used to <u>built</u> an efficient chatbot for banking industry:</p> <ul style="list-style-type: none"> IBM Watson Assistant – To build Chatbot interface Flask – Web framework for the chatbot NLP – Answering customer queries AI, DL – To Automate the banking process
3.	Novelty / Uniqueness	By answering questions and saving time and effort, an AI-powered chatbot provides <u>a 24 hours</u> a day, seven days a week, efficient automated banking process to both clients and staff.
4.	Social Impact / Customer Satisfaction	Chatbot will offer personalised and effective contact between the user and the bank in order to address the user satisfaction issues related to banking services. It is intended to serve as the all-encompassing virtual assistant that enables users to ask banking-related queries without going to the bank or calling customer care centres and to offer pertinent recommendations.
6.	Scalability of the Solution	AI chatbots are available around-the-clock to answer all consumer questions and walk them through the entire banking procedure. It maintains a private dialogue with clients and provides voice help features. It can be adjusted to the bank's specifications to include responses to inquiries about any new feature or
		service the bank introduces.

3.4 Problem Solution fit

Project Title: AI based discourse for Banking Industry

Project Design Phase-I - Solution Fit

Team ID: PNT2022TMID28540

<p>1. CUSTOMER SEGMENT(S)</p> <ul style="list-style-type: none"> -Bank Account Holders - Net Banking Users - Loan borrower 	<p>6. CUSTOMER CONSTRAINTS</p> <p>Customer should hold a Bank Account</p> <ul style="list-style-type: none"> - Smart Device with active Internet Connection - Customer should have install Banking Application. 	<p>5. AVAILABLE SOLUTIONS</p> <ul style="list-style-type: none"> -simple banking queries can be resolved quickly. -Provides on-time notification and reminders. -Available through 24/7.
<p>2. PROBLEMS/PAINS</p> <ul style="list-style-type: none"> -Customer should manually visit the Bank for creating Account and solving Banking queries which consumes much time. -losing customer insights. -Need to be maintained. 	<p>9. PROBLEM ROOT CAUSE</p> <ul style="list-style-type: none"> -Might have worries under their Account Privacy. -Longer to resolve complaints -Customers don't want to visit bank for every time for bank related functions. 	<p>7. BEHAVIOUR</p> <ul style="list-style-type: none"> -Late response from bank disappoints customers. - Bank Consumes more time for providing banking functionalities to customers.
<p>3. TRIGGERS</p> <p>Banking customers wants to make their life easier, save time from manual banking and want to become smart through technologies.</p>	<p>10. YOUR SOLUTION</p> <p>An automated solution, such a chatbot, which can answer all simple questions, can be used to address this issue. By delegating all straightforward customer requests to a chatbot, you may lighten the effort of your staff. It comprehends human languages</p>	<p>8. CHANNELS of BEHAVIOUR</p> <p>ONLINE:</p> <p>Through Advertising in social medias, news platform makes customer to know and recognize the effectiveness of banking chatbot and their instant and secure features</p> <p>OFFLINE:</p> <p>words of mouth among customers</p>

4 REQUIREMENT ANALYSIS:

4.3 Functional requirement

Functional Requirements: Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Greetings	As soon as consumer joins chat Bot, it should greet them
FR-2	Faster joining	Customers don't need to register in advance to use the bot; it will be available right away.
FR-3	Savings Account Creation Guide	The chatbot should be able to respond to inquiries about Kids Savings Accounts, Regular Savings Accounts, and Zero Balance Savings Accounts. It should also respond to the inquiries about minimum balance, interest rate, credit and debit cards.
FR-4	Current Account Creation Guide	The chatbot should be able to answer questions regarding proprietorship, partnership accounts, type of company, current account closure steps, updated GSTIN and zero balance account.
FR-5	Loan Query Clarification	The chatbot should be able to respond to inquiries on student loan, house loan, gold loan, top-up loan, and car loan. It should respond to queries like type of loan, available loan amounts, loan status and joint loan.
FR-6	General Query Clarification	The chatbot should provide information on a branch finder, bank working days, a list of nearby branches, CIBIL, storage lockers, currency conversion rules, and other subjects.
FR-7	Net Banking Clarification	The chatbot should be able to respond to inquiries regarding the features of net banking, how to sign up for it, daily limit, types of fund transfer, add beneficiary and any issues you might be experiencing.
FR-8	Further assistance	If it was successful in solving the customer's problem or if further help is needed, the bot should inquire once more.

4.4 Non-Functional requirements

Non-functional Requirements: Following are the non-functional requirements of the proposed solution.

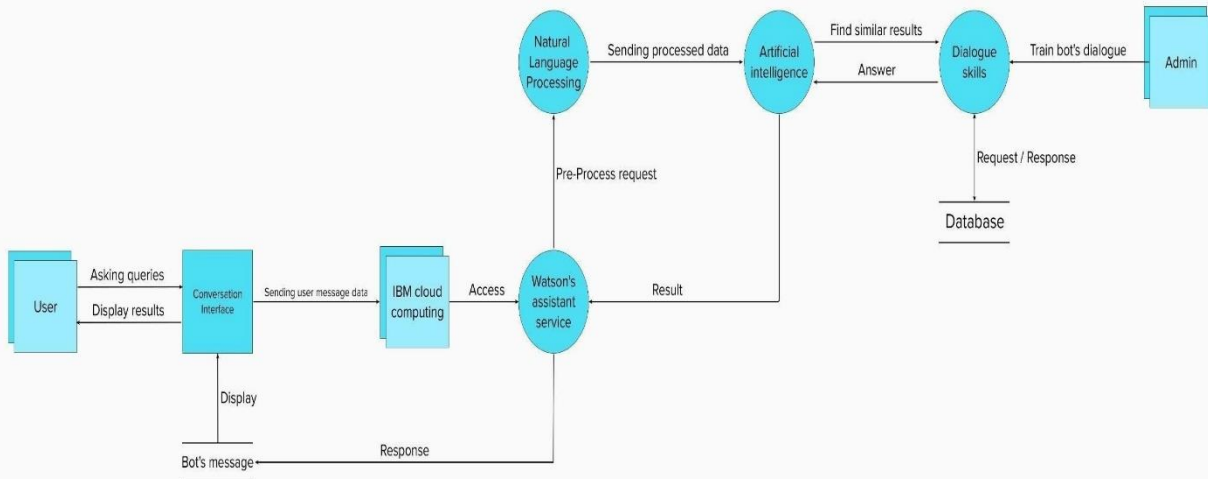
FR No.	Non-Functional Requirement	Description
NFR-1	Usability	To answer questions and provide assistance as needed, AI chatbots interact with people in a manner that is highly natural. Giving consumers timely assistance is the main goal of this chatbot. It addresses the queries of customers immediately and effectively in a <u>cost efficient</u> manner.
NFR-2	Security	The safety and privacy of consumer data is the most crucial aspect of banking. We have to make sure that the client data we collect is only accessible by your bank. 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. Users consider the accuracy of the information supplied by chatbot services to be a key element. <u>Thus</u> AI Chatbots has a reliable end-user experience.
NFR-4	Performance	AI Chatbots <u>are</u> 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. The chatbot should be connected to a knowledge-based database and set up to retrieve data quickly.
NFR-5	Availability	AI Chatbots <u>provide</u> 24/7 service to clear all customer queries and guide them through all the banking processes. They should always be available and ready to answer questions from guests who arrive late at night or who are just in another time zone, whether it is during the day or night.
NFR-6	Scalability	Chatbots have the ability to develop to the point where they can manage difficult questions and resolve a variety of other complex questions that can only be handled by human agents. AI Chatbots <u>are</u> helping banking industry to scale their customer service and to improve customer service satisfaction at the same time. This removes chatbots' restrictions on being useful to a certain set of individuals and boosts their capacity for managing a huge number of people at once.

5 PROJECT DESIGN:

5.1 Data Flow Diagrams

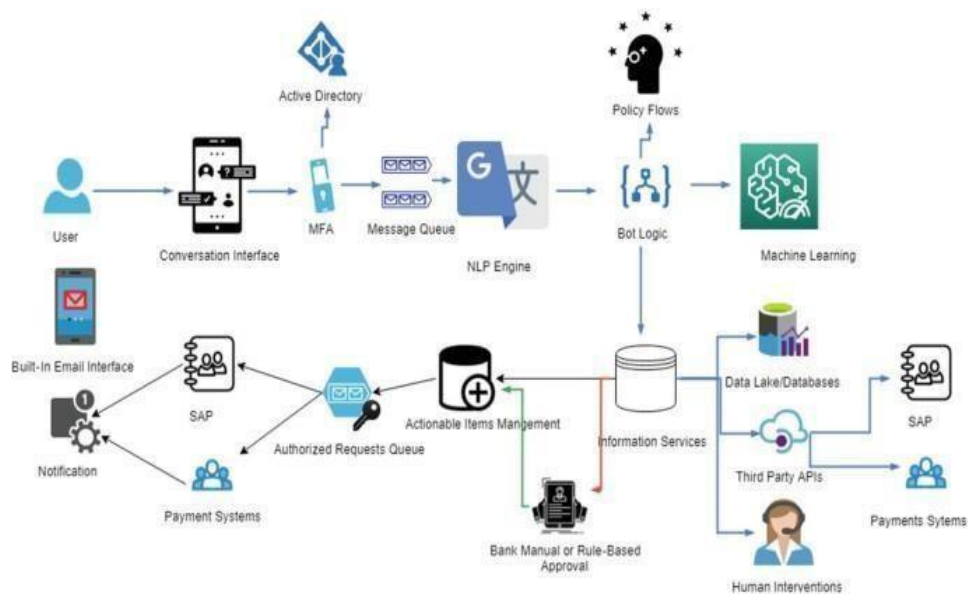
A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

DATA FLOW DIAGRAM



5.2 Solution & Technical Architecture

SOLUTION ARCHITECTURE:



TECHNICAL ARCHITECTURE:

TECHNOLOGY ARCHITECTURE

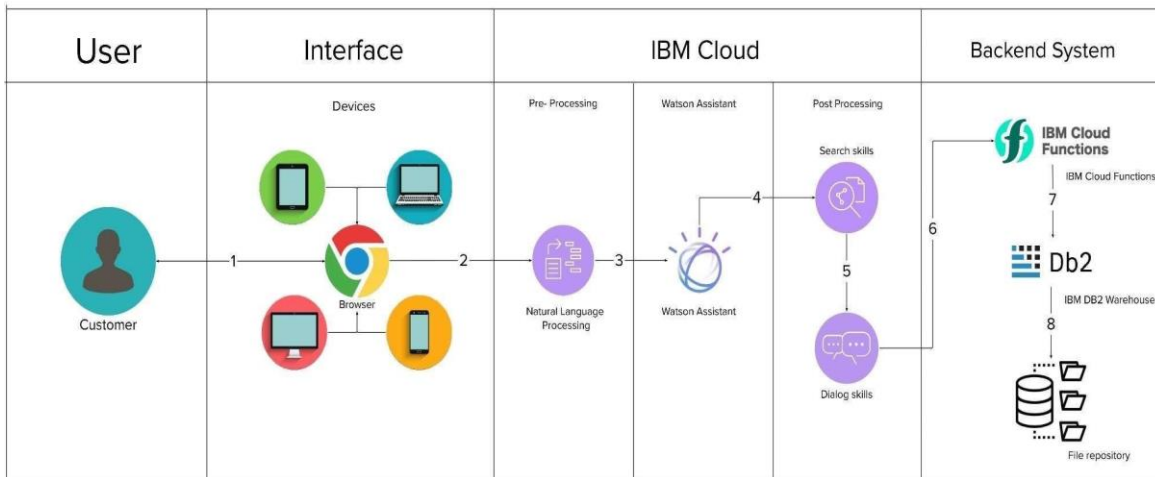


Table-1: Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	Logic for a process in the application	Python
3.	Application Logic-2	Logic for a process in the application	IBM Watson STT service
4.	Application Logic-3	Logic for a process in the application	IBM Watson Assistant
5.	Database	Data Type, Configurations etc.	MySQL, NoSQL, etc.
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloud ant etc.
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	Purpose of External API used in the application	IBM Weather API, etc.
9.	External API-2	Purpose of External API used in the application	Aadhar API, etc.

10.	Machine Learning Model	Purpose of Machine Learning Model Server Configuration: Local System / Cloud Local Application Deployment on	Object Recognition Model, etc.
11.	Infrastructure (Server / Cloud)	Cloud Server Configuration :	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Anaconda Navigator, Tensor flow, Keras, Flask
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	e.g. SHA-256, Encryptions, IAM Controls, OWASP etc.
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Microservices)	Response time, Throughput, CPU and network usages, etc.
4.	Availability	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)	All kind of users.
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc.	Watson Assistant is used to build the chatbot.

5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority
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Customer (Mobile user)	Download the database	USN-1	As a user, I can register for the application by entering my email, and password, and confirming my password.	I can access my account / dashboard	High
	Register	USN-2	As a user, I can register for the application by entering my email, and password, and confirming my password.	I can receive a confirmation email & click confirm	High
	Login	USN-3	As a user, I will receive a confirmation email once I have registered for the application	I can register & access the dashboard with Facebook Login	Low
	Querying	USN-4	User query with a chatbot for clarifications.		Medium
Customer (Web user)	The functional requirements are same as a mobile user	Same as a mobile user	Same as a mobile user	Same as a mobile user	High when compared to mobile users

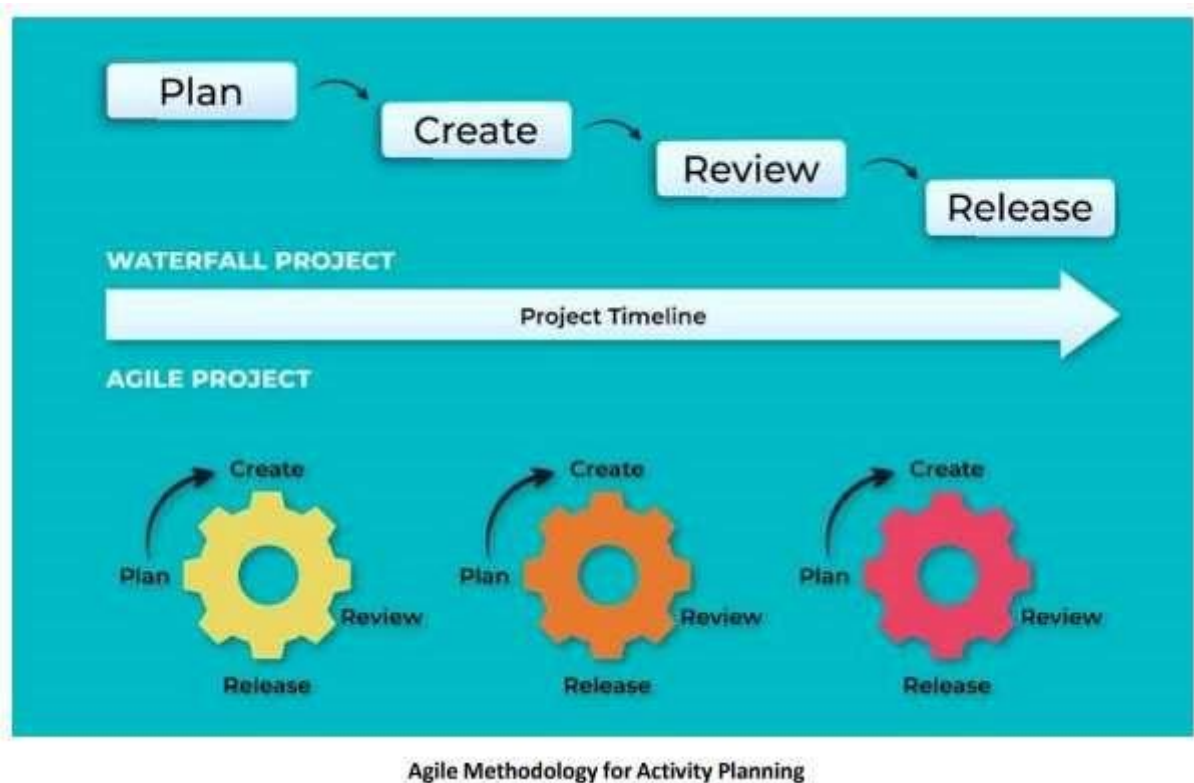
6 PROJECT PLANNING AND SCHEDULING:

6.1 Sprint Planning & Estimation

To accomplish the above task, you must complete the below activities and tasks:

1. Create IBM Services.
2. Creating skills & Assistant for Chatbot.
3. Creating Savings account action.
4. Creating Current account action.
5. Creating Loan account action.
6. Creating a general query action.
7. Creating a Net banking action.
8. Create HTML web page.

9. Integrate the Watson Chatbot with web page.



6.2 Sprint Delivery Schedule

Product Backlog, Sprint Schedule, and 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	SUGANTHI SWARNA P
Sprint-1	Chatbot Skills Creation	USN-2	As a user, I will see the Chatbot having banking related skills.	1	high	UMA MAHESHWARI K
Sprint-2	Creating Saving Account Action	USN-3	As a user, I can converse with the chatbot regarding saving account-related queries.	2	Medium	SUGANTHI SWARNA P
Sprint-2	Creating Current Account Action	USN-4	As a user, I can converse with the chatbot regarding current account-related queries.	2	Medium	UMA MAHESHWARI K

Sprint-3	Creating Loan Account Action	USN-5	As a user, I can converse with the chatbot regarding loan account-related queries.	2	High	SRINISHANTHINI RB
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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	ROSY S
Sprint-3	Creating Net Banking Action	USN-7	As a user, I can converse with the chatbot regarding net banking-related queries.	2	high	SRI NISHANTHINI R.B
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	ROSY S
Sprint-4	Build HTML Code	USN-9	As a user, I can web pages integrated with a chatbot.	1	Medium	UMA MAHESHWARI K
Sprint-4	Run The Application	USN-10	As a user, I can communicate with the chatbot 24*7.	1	Low	SUGANTHI SWARNA P

Project Tracker, Velocity & Burndown Chart:

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

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)

$$AV=20/2=10$$

$$AV=10$$

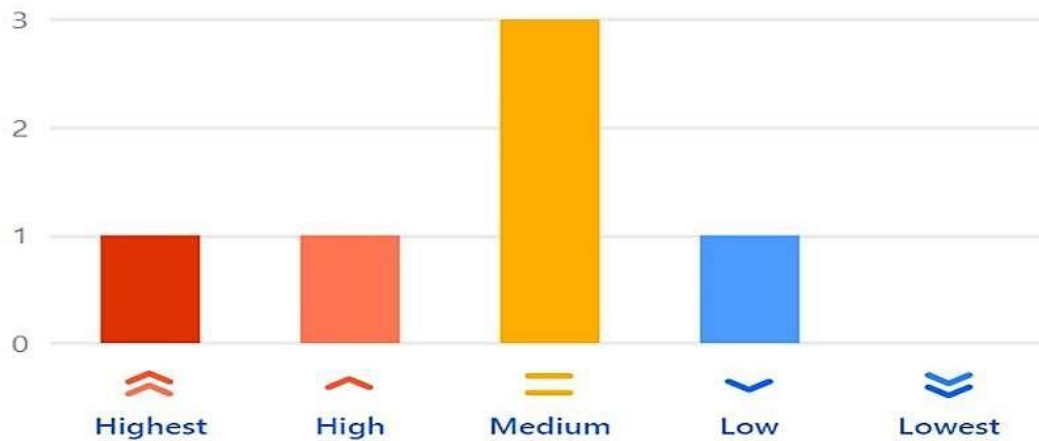
Burndown Chart:

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

Get a holistic view of how work is being prioritized within your project. To check if the team's focusing on the right work, go to the list view.



6.3 Reports from JIRA

	OCT	NOV
Sprints	ABDF...	ABDF... ABDF... ABDF...
> <u>ABDFBI-26 Savings Account Related Actions</u> DONE		
> <u>ABDFBI-27 Current Account Related Actions</u> DONE		
> <u>ABDFBI-28 Loan Account Related Actions</u> DONE		
> <u>ABDFBI-29 General Queries Related Actions</u> DONE		
> <u>ABDFBI-30 Net Banking Related Actions</u>		
> <u>ABDFBI-31 Web Application</u> DONE		
> <u>ABDFBI-32 User Interface and Web Pages</u> DONE		

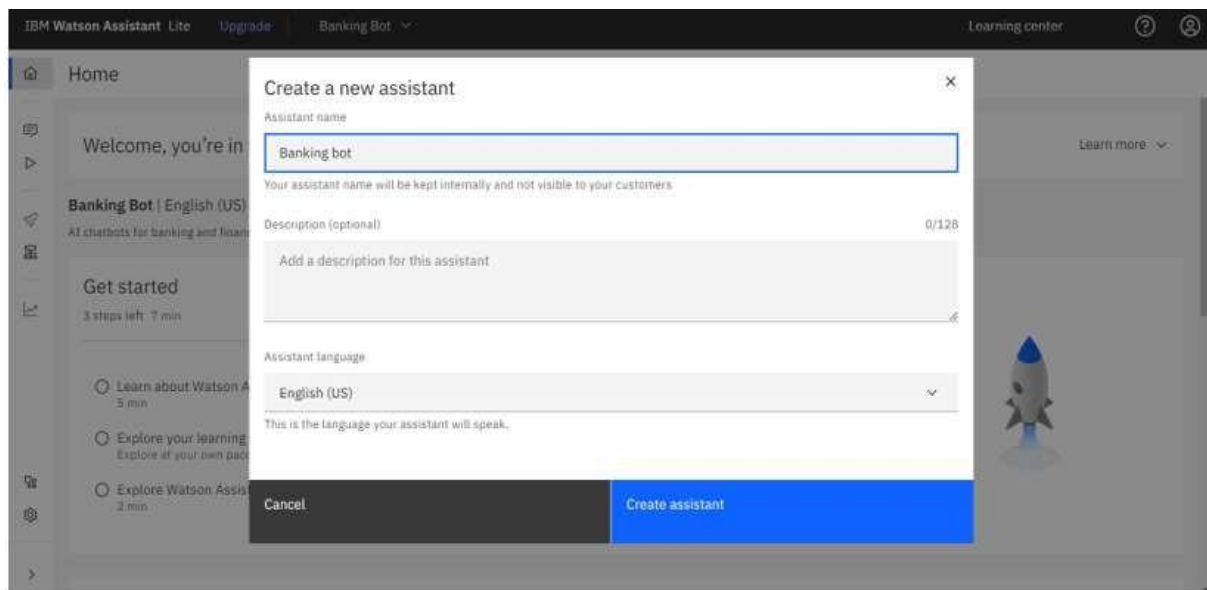
7 CODING & SOLUTIONING:

7.1 Feature 1

Create IBM Service

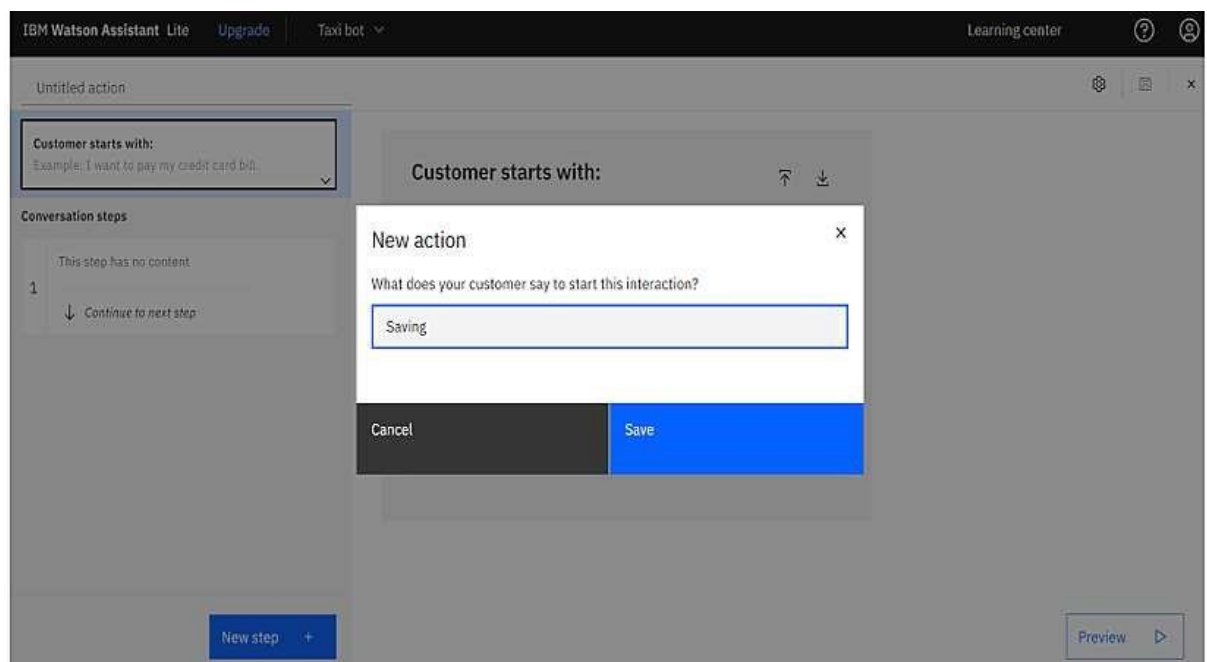
In this activity, you will be creating the Necessary IBM service. The following are the service that you have to create.

- Watson Assistant

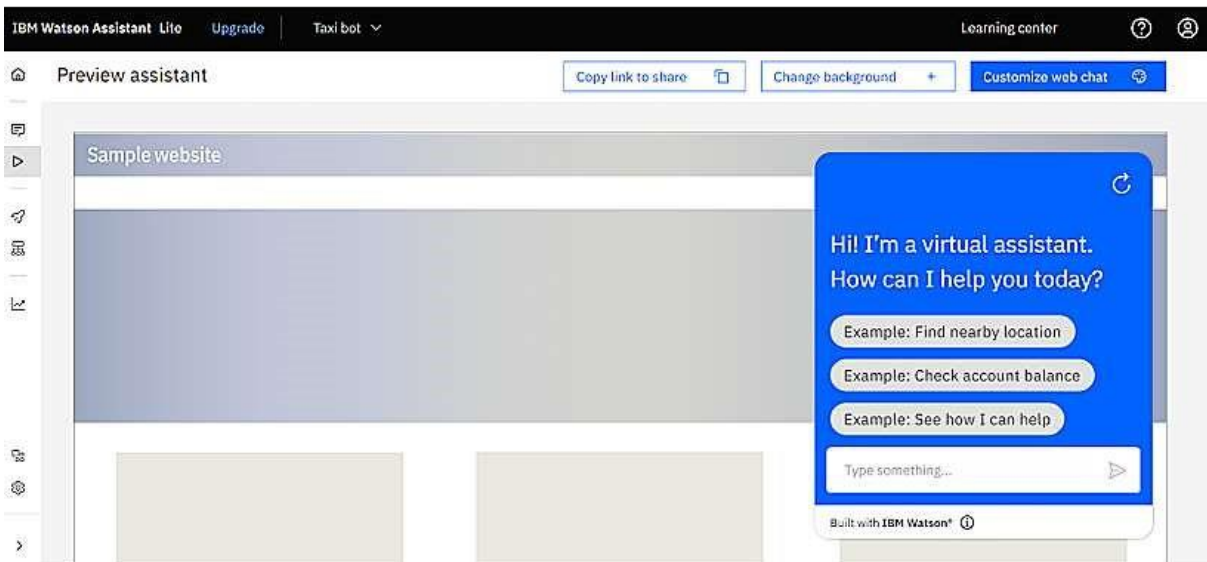
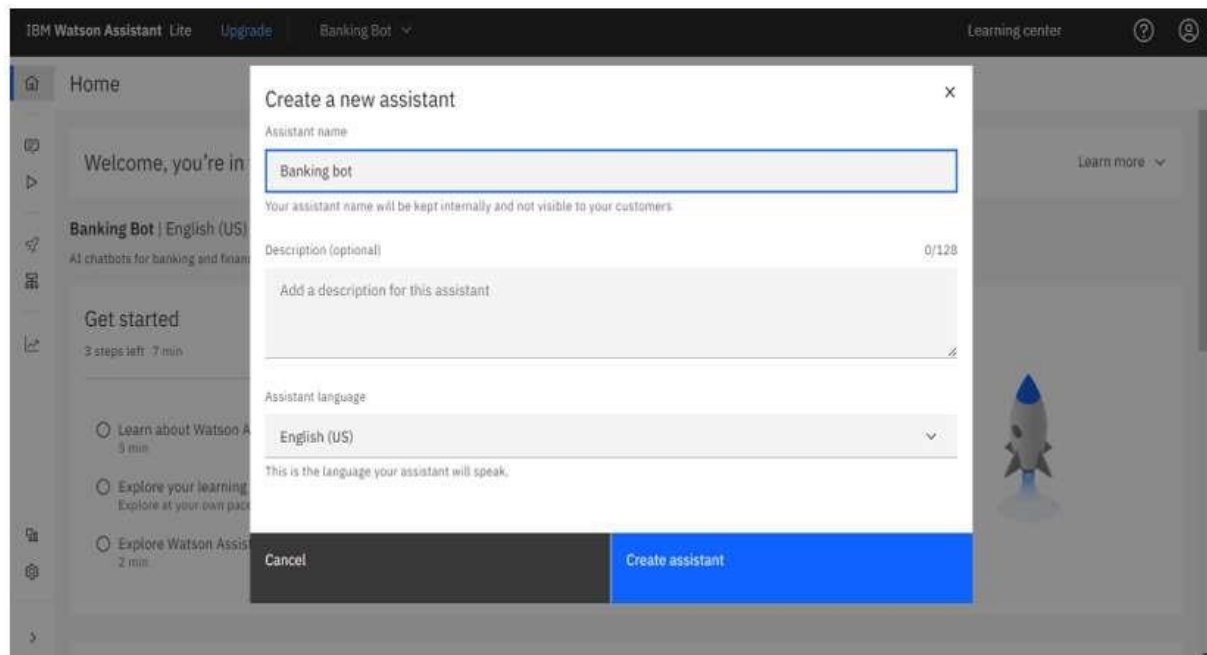


Creating Skills & Assistant For Chatbot

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

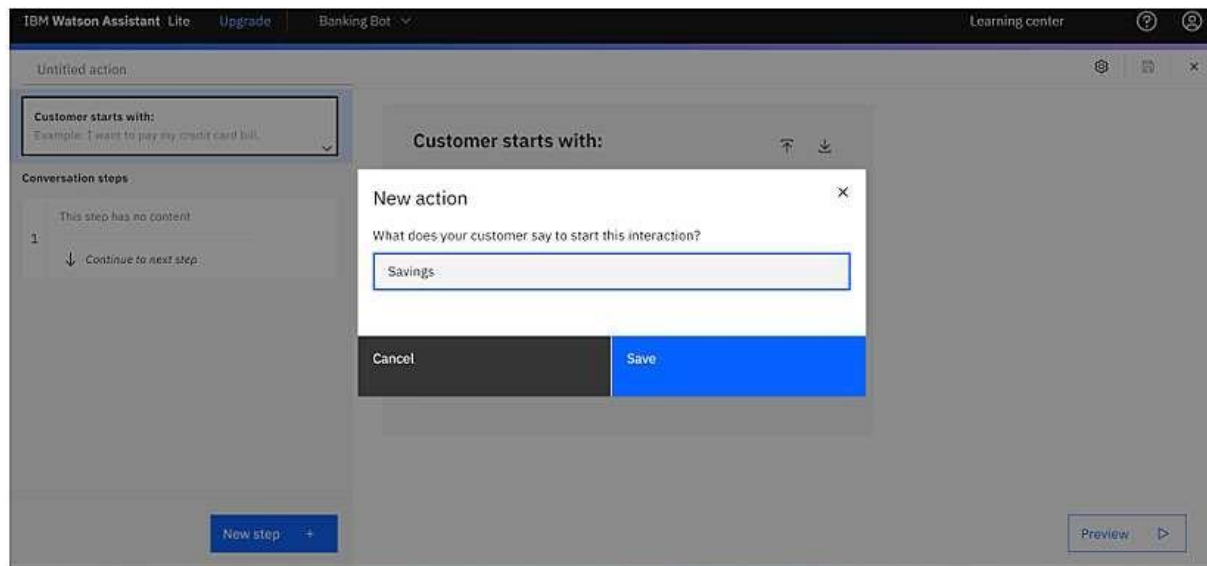


A default template chatbot is created. Need to add actions.

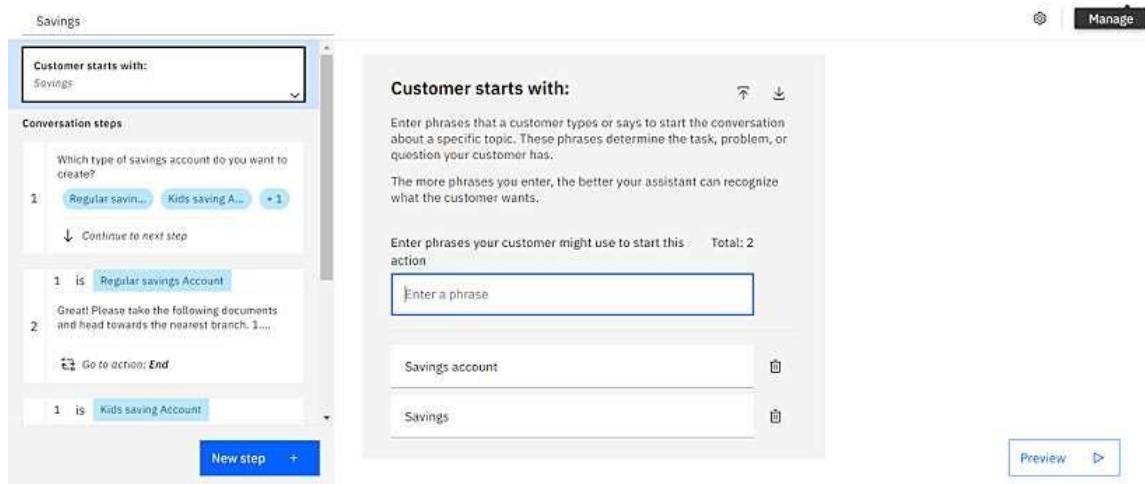


Creating Saving Account Action

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

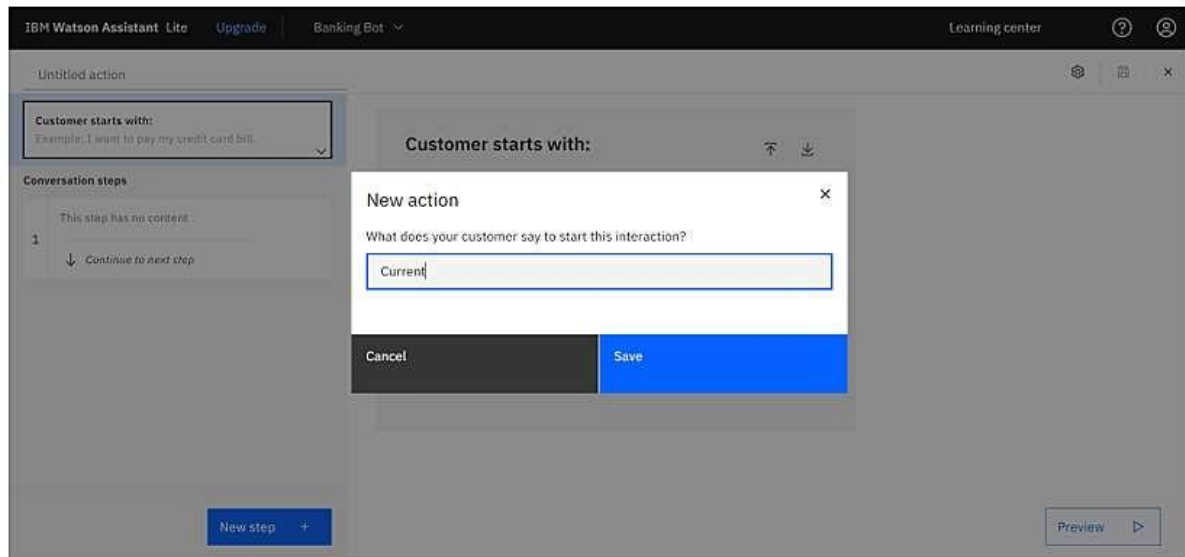


Add steps in savings action.

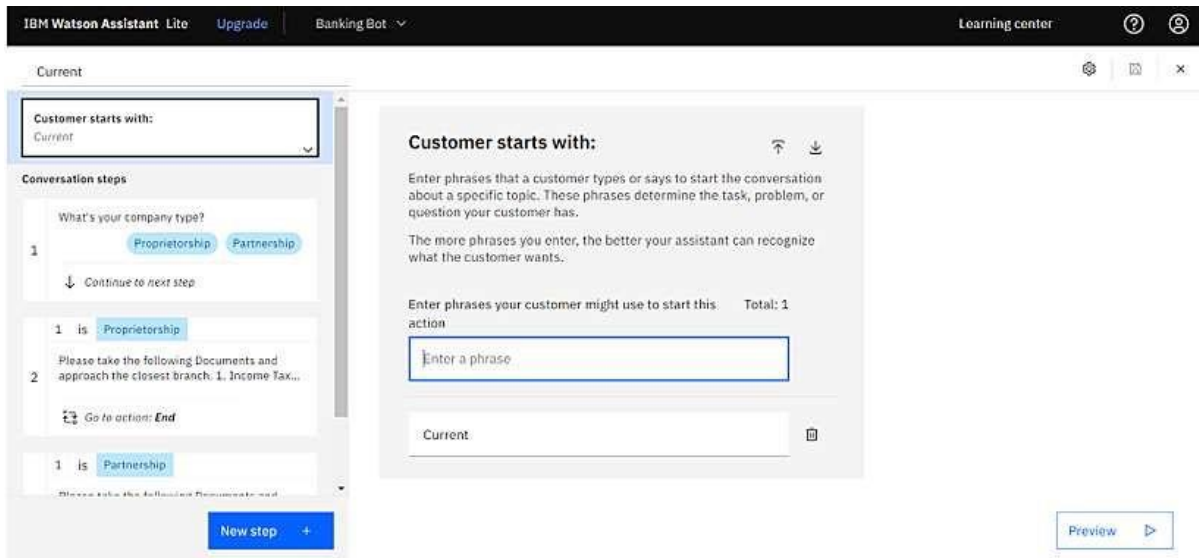


Creating Current Account Action

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

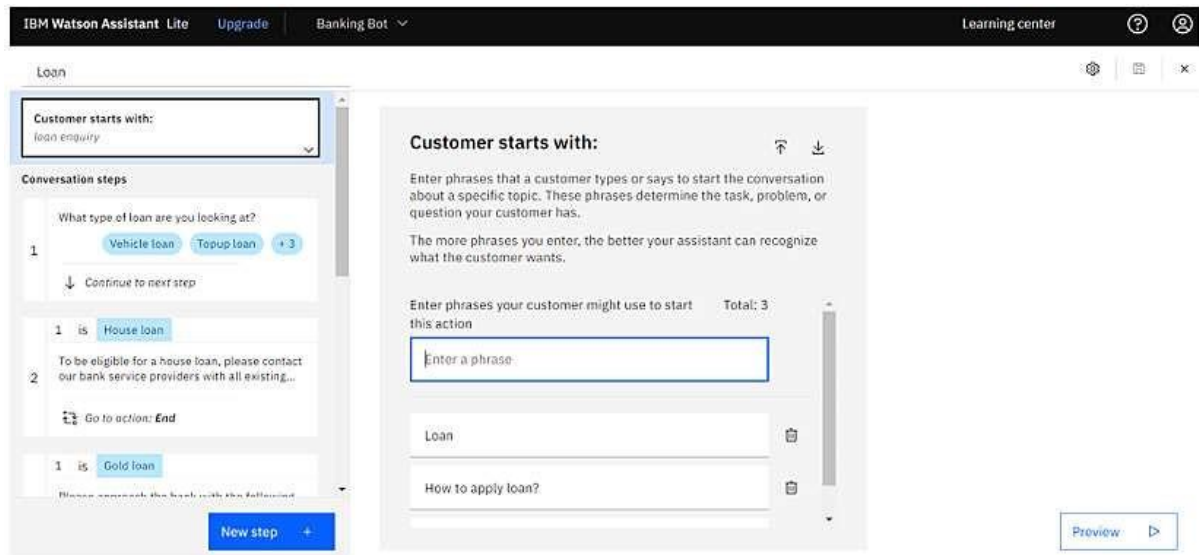


Add steps in current action.



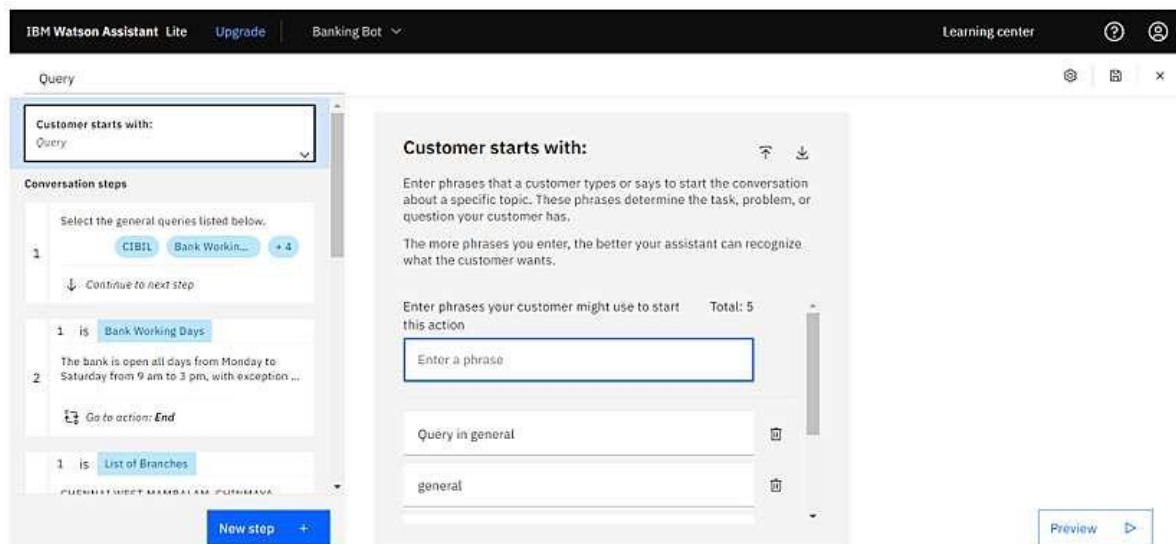
Creating Loan Account Action

Loan action is created with the necessary steps.



Creating General Query Action

General query action is created with the necessary steps.



Creating Net Banking Action

Net banking action is created with the necessary steps.

IBM Watson Assistant Lite

Upgrade

Banking Bot

Learning center

Net Banking

Customer starts with:

Net Banking

Conversation steps

What queries do you have regarding Net banking?

1

What are the ...

What is Net B...

+ 2

Continue to next step

1 is

What is Net Banking?

The facility offered by the bank allows customers to use banking services over the...

2

Go to action: End

1 is

How do I register for Net Banking?

New step +

Customer starts with:

Enter phrases that a customer types or says to start the conversation about a specific topic. These phrases determine the task, problem, or question your customer has.

The more phrases you enter, the better your assistant can recognize what the customer wants.

Enter phrases your customer might use to start this action

Total: 1

Enter a phrase

Net Banking

Preview



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

Q

↑

New action +

Name	Last edited	Status
Current	2 days ago	✓
Index	2 days ago	✓
Register	3 days ago	✓
Greeting	2 days ago	✓
End Greeting	2 days ago	✓

			  New action +
Name	Last edited	Status	
Net Banking	3 minutes ago		
End	2 days ago		
Loan	2 days ago		
Query	a few seconds ago		
Savings	16 minutes ago		
Current	2 days ago		
Items per page: 50 ▾ Showing 1–10 of 10 actions			1 ▾ 1 of 1 pages  

Creating Assistant & Integrate With Flask Web Page

You will be 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.

7.2 Feature 2

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.

8 TESTING

8.1 Test Cases

- ✓ Verify user is able to see the chatbot icon when website is launched
- ✓ Verify the UI elements in chatbot icon popup
- ✓ 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"
- ✓ Verify user is able to type query in text field.
- ✓ Verify user is able to get the response from chatbot
- ✓ Verify user whether get the response if the user enter the wrong query also

8.2 User Acceptance Testing

Defect Analysis

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

Resolution n	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

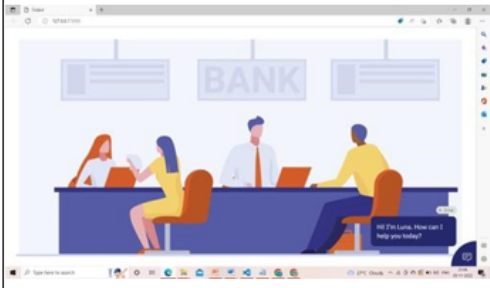

Test Case Analysis




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

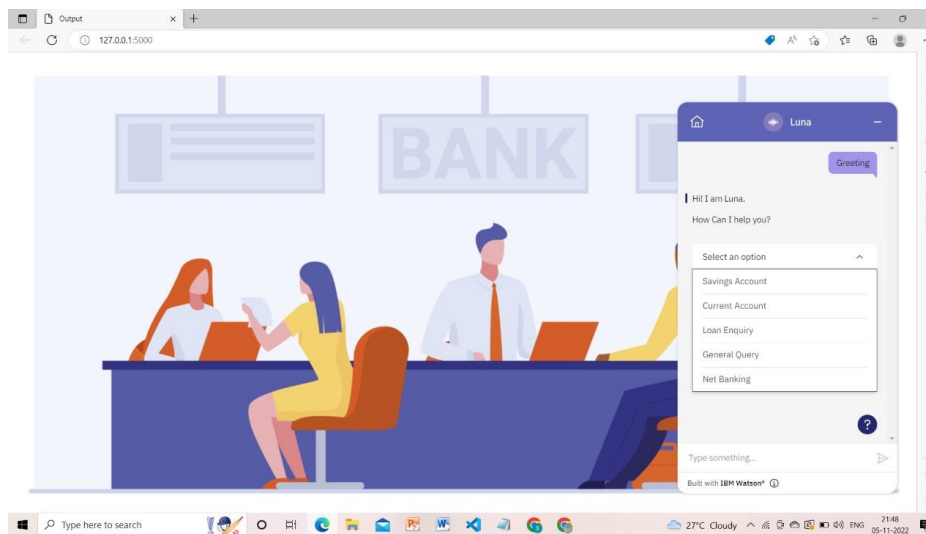
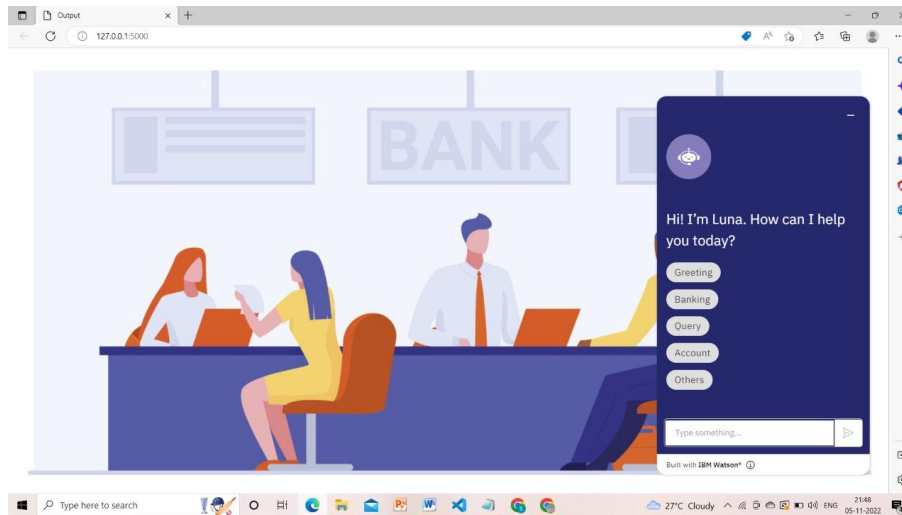
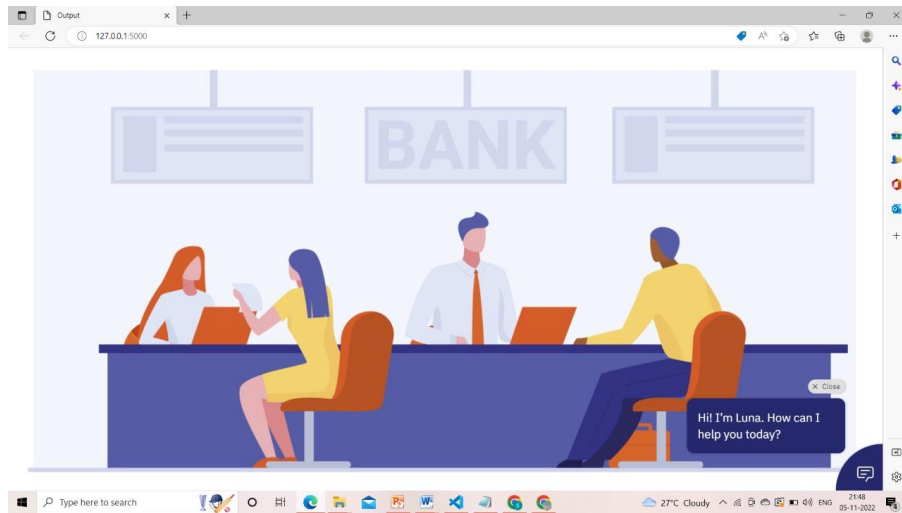
9 RESULTS:

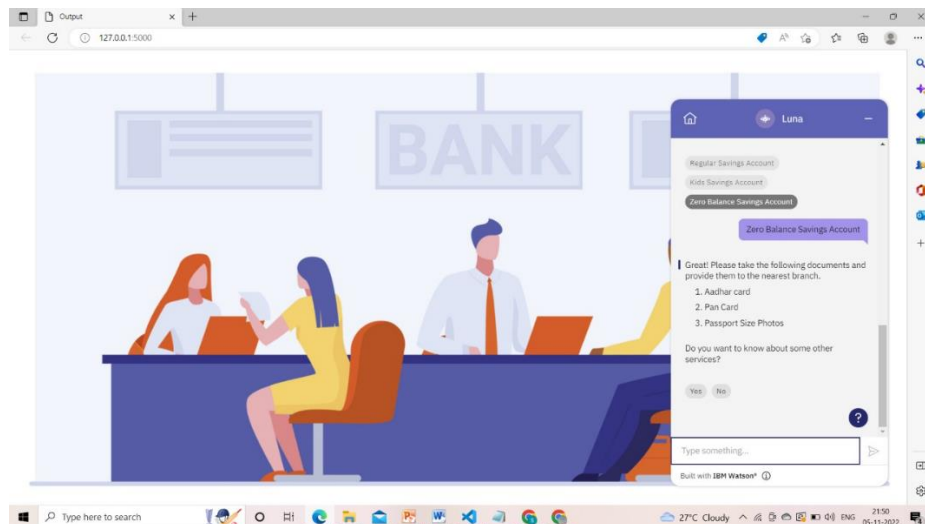
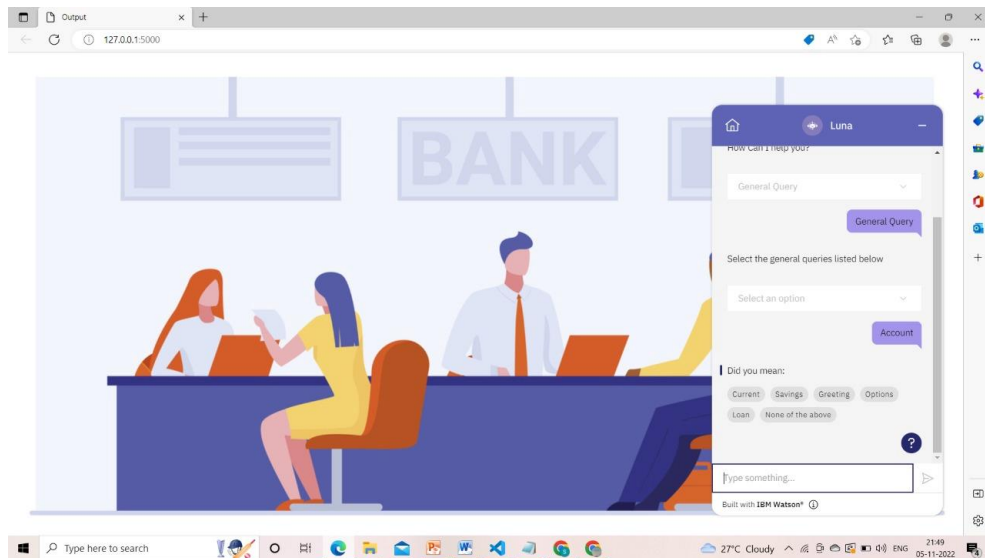
9.1 Performance Metrics

S.No	Parameter	Values	Screenshot
1.	Model Summary	The user interacts with the chatbot and chooses from a list of frequently asked questions by banking customers. A single chatbot may ask different users at different times in different scenarios. When a consumer asks a question that is regularly asked, the chatbot will rapidly react with the expected response. The chatbot includes responses to questions about any feature or service the bank offers..	 

			 
2.	Accuracy	<p>Training Accuracy – 100%</p> <p>Validation Accuracy – 100%</p>	

9.2 Output





10 ADVANTAGES & DISADVANTAGES:

Advantages:

- Round-the-clock service.
- Brand Consistency.
- Increased Productivity.
- Reduced Staffing Needs.
- Consistent Response Rate and Availability.
- Helps with Fraud Prevention.

- Chats can be saved.
- Lower costs.

Disadvantages:

- Questions must be programmed beforehand.
- Impersonal
- Must keep information up-to-date.
- Technology issues.
- Needs additional measures to protect identities.

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 modelling 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:

- ✓ The share of banks that use AI solutions and chatbots in particular is constantly rising. As another factor, the use of smartphones and other smart devices is also a rapidly growing trend. These two driving forces determine the near future of artificial intelligence assistants in the banking industry.
- ✓ More and more banks tend to integrate chatbots into their mobile apps. This is a convenient way to stay in touch with their clients and, at the same time, reduce the involvement of human personnel. According to estimations calculated by Juniper Research, in 2023, chatbot interactions will save 862 million hours for banks, which equals to \$7.3 billion cost savings worldwide.

13 APPENDIX:

13.1 Source Code:

HTML CODE:

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<title>Output</title>
<link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/css/bootstrap.min.css">
<style>
body
{
background-image: url("https://i.postimg.cc/W4H9BzNW/image.jpg"); background-
size: cover;
}
</style>
</head>
<body>
<script>
  window.watsonAssistantChatOptions = {
    integrationID: "fcd8c7f8-333c-4518-9c8a-53d9b5ad1073", // The ID of this
integration.
    region: "us-south", // The region your integration is hosted in.
    serviceInstanceID: "8980c29e-0ec5-4b3f-b3ca-d81d8ec41e2b", // The ID of your
service instance.
    onLoad: function(instance) { instance.render(); }
  };
  setTimeout(function(){
    const t=document.createElement('script');
    t.src="https://web-chat.global.assistant.watson.appdomain.cloud/versions/" +
(window.watsonAssistantChatOptions.clientVersion || 'latest') +
"/WatsonAssistantChatEntry.js";
    document.head.appendChild(t);
```

```
});  
</script>  
</body>  
</html>
```

PYTHON CODE:

```
from flask import Flask, render_template  
app = Flask(__name__, template_folder = 'template')  
  
@app.route('/')  
def bot():  
    return render_template("chatbot.html")  
  
if __name__ == '__main__':  
    app.run()
```

13.2 GitHub & Project Demo Link

DEMO VIDEO: [https://drive.google.com/drive/folders/1VjYHjX-L6iweEkFeXnKnqkFSad5JBUvE?usp=share link](https://drive.google.com/drive/folders/1VjYHjX-L6iweEkFeXnKnqkFSad5JBUvE?usp=share_link)

PROJECT: <http://127.0.0.1:5000>

GitHub Link : <https://github.com/IBM-EPBL/IBM-Project-35339-1660283665>

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-8980c29e-0ec5-4b3f-b3ca-d81d8ec41e2b%3A%3A15a6900d-b12d-4882-926e-8e65badc9abc&integrationID=fcd8c7f8-333c-4518-9c8a-53d9b5ad1073®ion=us-south&serviceInstanceID=8980c29e-0ec5-4b3f-b3ca-d81d8ec41e2b>