AI BASED DISCOURSE FOR BANKING INDUSTRY

A PROJECT REPORT

Submitted by

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ANNA UNIVERSITY : CHENNAI 600 025

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CHAPTER 1
INTRODUCTION

1.1 PROJECT OVERVIEW

A chatbot is a computer software program that conducts a conversation via textual. Chatbots are programs that work on Artificial Intelligence (AI) & Machine Learning Platform. The present study advances the understanding of human-AI interactions by producing new knowledge on chatbot affordances and customer value creation.

In this project, we used Watson's assistant to create a chatbot. This chatbot has the following capabilities:

- This chatbot can guide a customer through creating a bank account.
- This chatbot can answer loan queries.
- This chatbot can be used to answer general banking queries.
- This chatbot can answer queries regarding net banking.

1.2 PURPOSE

In banks, at user care centres, and at inquiry desks, humans are insufficient and usually take a long time to process a single request, which results in wastage of time and also reduces the quality of user service. The main purpose of this chatbot is that users can interact by mentioning their queries in plain English, and the chatbot can resolve their queries with an appropriate response in return. The chatbot will be used to give information or answers to any question asked by the user related to banking. It is more like a virtual assistant; people feel like they are talking with a real person.

Furthermore, this chatbot is intended to provide consumers with prompt assistance while also improving the bank's and its employees' operating efficiency. Also, conversational AI in banking helps employees distribute their workload. It assists consumers in the majority of banking settings, from responding to them immediately to aiding them with anything they need. It recognises human languages and allows for text-based communication. These banking chatbots converse with humans in a very natural manner in order to handle their queries and provide support as needed.

CHAPTER 2

LITERATURE SURVEY

2.1 EXISTING PROBLEM

The fundamental problem with banking chatbots in customer support comes with interpreting the messages and understanding the user's intention. Unlike machines, who know the one and only possible way of saying things, people do it in a variety of ways. Another thing that needs to be considered is the style of the chatbot. The user doesn't really like to deal with an answering machine. They want a little bit more effective interaction. That means chatbots need to have some attitude. The big problem that comes with customizing and adjusting chatbot behaviour is understanding the limits of natural language processing (NLP). The current state of natural language processing is not advanced enough to tackle everything. The synonyms and the extraction of entities have been taken care of, but what about the mixing of local language and the words and slang being added to the vocabulary at a speed we are not matching with? As a result, chatbots have to deal with a lack of personality and conversational flow. Chatbots can't solve everything. Even though chatbot development challenges can be cost-effective in their operation and labour, they could be costly as they require a high level of coding.

2.2 REFERENCES

2.2.1 Artificial intelligence powered banking chatbot (2018)

K. Satheesh Kumar, S. Tamilselvan, B. Ibrahim Sha, S. Harish

The dataset, architecture, and methodology used to create such a chatbot are all defined in this paper. The dataset was created from FAQs on bank websites. This study compares seven machine learning (ML) classification algorithms that are used to categorize input for chatbots. It reduces the response time and increases the availability of services.

Link:
https://ijesc.org/upload/4a63d52eda62397d8c051e687773e6d0.Artificial%20Intelligence%20Powered %20Banking%20Chatbot.pdf

2.2.2 Chatbot in python (2019)

Akshay Kumar, Pankaj Kumar Meena, Debi Prasanna Panda, Ms. Sangeetha

Using Artificial Intelligence Markup Language (AIML) and Latent Semantic Analysis (LSA) on a Python platform, researchers present the design of a chatbot that responds to each enquiry with a sincere and accurate response

Link: https://www.irjet.net/archives/V6/i11/IRJET-V6I1174.pdf

2.2.3 Chatbot development using python (2020)

Shreyashkar Sharma

The primary goal that will be covered in this article is the creation of a web API as well as some sample web and text messaging interfaces that show how to use API. Researchers are attempting to comprehend these chatbots and their drawbacks in this research work.

Link: https://www.studypool.com/documents/6540002/chatbot1

2.2.4 Conversation to automation in banking through chatbot using artificial intelligence language (2020)

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

This paper examines some of the most recent AI patterns and activities before offering alternate theories of change for some of the most well-liked and commonly accepted postulates of the present. based on fundamental artificial intelligence System-chatbots, also known as chatterbots, are created by structuring and working with (artificial intelligence) for this purpose. The study demonstrates how AI is always developing. There isn't enough knowledge on AI at the moment, but this study introduces a novel idea that deals with machine intelligence and illuminates the possibilities of intelligent systems.

Link:

https://www.researchgate.net/publication/344285556_Conversation__Automation_in_Banking_Thr ough_Chatbot_Using_Artificial_Machine_Intelligence_Language

2.2.5 Banking chatbot (b-bot) (2021)

Dr. C. Punitha Devi, Dr. S. Geetha, N. Nagalakshmi, S. Karthiga, V. Suvidhaa

The purpose of this article is to construct a chatbot that can respond to client inquiries, look up answers in the knowledge base, and offer a solution. In the end, less human work is required because the chatbot can manage the requests.

Link:https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwitie5qq7AhXrTWwGHXMxCxEQFnoECA4QAQ&url=https%3A%2F%2Fwww.turcomat.org%2Findex.php%2Frkbilmat%2Farticle%2Fdownload%2F5394%2F4501%2F10006&usg=AOvVaw2sikb8uiydK0s-LS4IFZeb

2.2.6 Chatbot using python (2022)

Susmitha Mary, Sweety Sahani

Researchers are attempting to understand these chatbots and their drawbacks in this research work. A user-submitted query or declaration that gives the user control over the displayed content

Link: https://doi.org/10.22214/ijraset.2022.43045

2.2.7 Banking bot (2018)

K. Khavya

This study covers the four fundamental bank transactions: adding and viewing a beneficiary, transferring funds, viewing the balance, and generating a small statement.

Link: https://www.ijntr.org/download_data/IJNTR04070041.pdf

2.2.8 Bank chatbot using python (2021)

Uttam Kumar Singh, Himanshi Goyal, Monica Kumari

This paper exemplifies the chatbot, which is capable of performing every task a bank can, including withdrawing money, making deposits, and learning about the bank's various products.

Link:https://www.proquest.com/openview/54dcf271505dd83259072714a7b92304/1.pdf?pqorig

site=gscholar&cbl=2045096

2.3 PROBLEM STATEMENT DEFINITION

Traditional banks charge fees for a wide range of financial services, like checking the balance. Although traditional banks provide face-to face customer service, it sometimes takes longer to resolve customer complaints. This procedure also necessitates a slew of paperwork and bureaucracy, which can be time-consuming. Traditional banks have set once hours and days when they are open. This means you can only visit banks during this time. Banks may encounter a wide range of problems, both simple and complex. Customer service representatives are frequently overburdened, and they fail to give each customer the attention they require. This frequently results in negative experiences and may even cause them to leave.

Therefore, the goal of this project is to create a chatbot that can handle all simple queries. This banking chatbot responds to specific customer queries that are related to various loan information, answers banking queries, and answers questions regarding net banking. It also instructs the customers on how to open a savings or current account.

CHAPTER 3
IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

3.2 IDEATION AND BRAINSTROMING

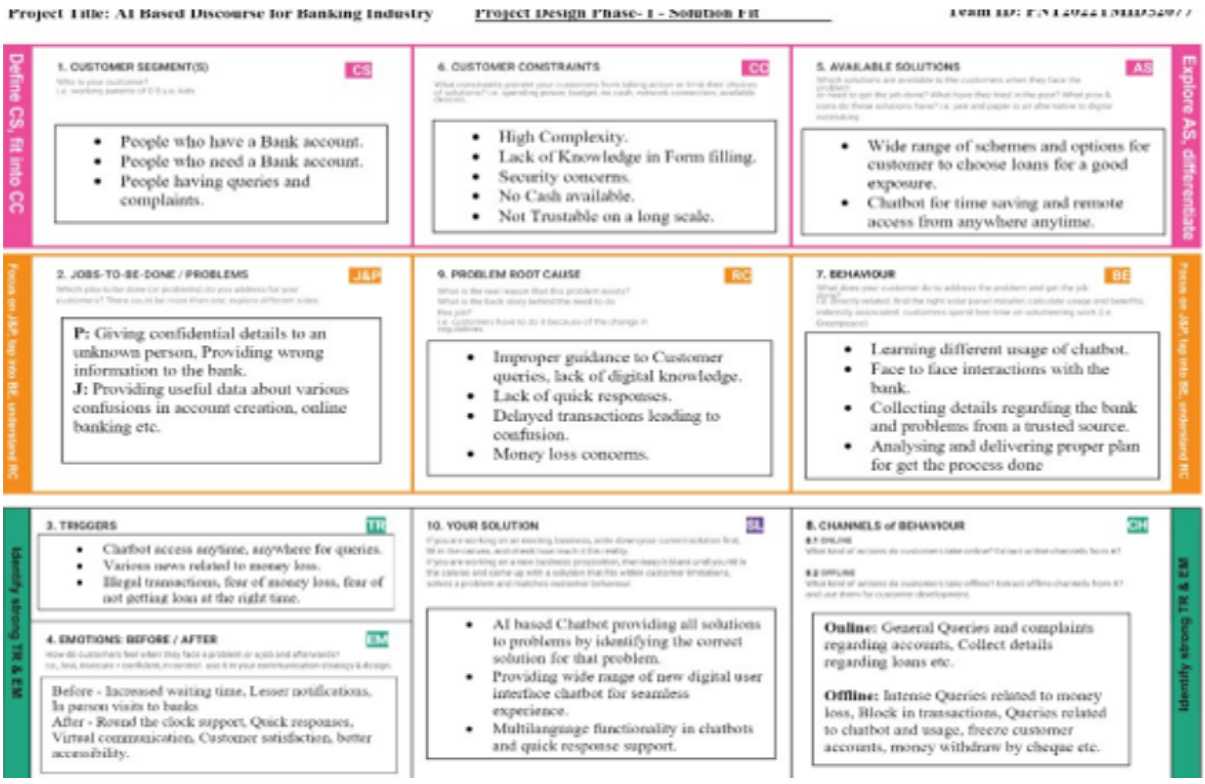
3.3 PROPOSED SOLUTION

S. No.	Parameter	Description
1	Problem Statement (problem to be solved)	Traditional banks charge fees for a wide range of financial services, like checking the balance. Although traditional banks provide face-to face customer service, it sometimes takes longer to resolve customer complaints. This procedure also necessitates a slew of paperwork and bureaucracy, which can be time-consuming. Traditional banks have set once hours and days when they are open. This means you can only visit banks during this time. Banks may encounter a wide range of problems, both simple and complex.
2	Idea / Solution description	This problem can be solved by using an automated solution, such as a chatbot, which can handle all simple queries. You could reduce your employees' workload by having a chatbot handle all of the simple customer requests. As a result, your employees will have more time to deal with more complex issues. AI chatbots communicate with humans in a very natural form to resolve their queries and assist them as required. The core purpose of this chatbot is to provide customers with prompt service. It understands human languages and supports them in text-based communication.
3	Novelty / Uniqueness	With automation, simple banking queries can be resolved in no time. This chat bot responds to specific customer queries that are related to various loans information, answers banking queries and answers queries regarding net banking can be easily automated with this banking chatbot. It also instructs the customers on how to open a savings or current account. Customers don’t need to scroll through the website or application to search for a certain piece of information and would rather just use bot.

4	Social Impact / Customer Satisfaction	Benefiting customers in banking is providing a better customer experience. Chatbots provide 24/7 client support, so existing and potential customers can try and solve their banking problems after work hours and on weekends. This ultimately leads to providing a better personalized experience for clients. Chatbots have access to the full client information even before they start the conversation process. More convenient mode of communication. Chatbots may combine various functionalities that would make them convenient for customers of different age groups. Customers can ask their questions on their convenient devices at any time and from any location, but more importantly, they can ask queries as many times as they want.
5	Business Model (Revenue Model)	The chatbot is the future of digital banking. With the advent of banking chatbots, certain essential aspects of customer care and support – such as speed, access to information, and pleasant encounters – are more feasible. Chatbots in digital banking may save a lot of money each year. By adopting artificial intelligence to banking, it decreases expenses. It increases work efficiency and decreases workload. If an AI chatbot can handle a customer's queries, they won't have to wait in line for a human agent or sit on the phone wringing their hands. Agents assisted by AI chatbots may focus on addressing complicated problems while the chatbots answer basic consumer questions on a large scale.

6	Scalability of the Solution	The AI in chatbots is evolving from rule-based to conversational AI. The banking chatbot's scalability has been increased from simple basic bank queries and checking balances to guiding customers on how to open bank accounts. This chatbot has the potential to grow to the point where it can handle complex queries and solve a wide range of other complex queries that only human agents can handle. This increases the scalability of handling a large number of people at the same time and breaks the limitations of chatbots that are only useful to a specific group of people. Banks need a huge customer support team because of their large customer base. Unlike human agents, banking chatbots can interact with thousands of customers at a time. They can help with query resolution using AI technologies and close tickets within no time.

3.4 PROBLEM SOLUTION FIT



CHAPTER 4
REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENTS

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Greetings	As soon as a consumer joins the chatbot, 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.
FR-4	Current account creation guide	The chatbot should be able to answer questions regarding proprietorship and partnership accounts.
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.
FR-6	General query clarification	The chatbot should provide information on a branch finder, 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, 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.

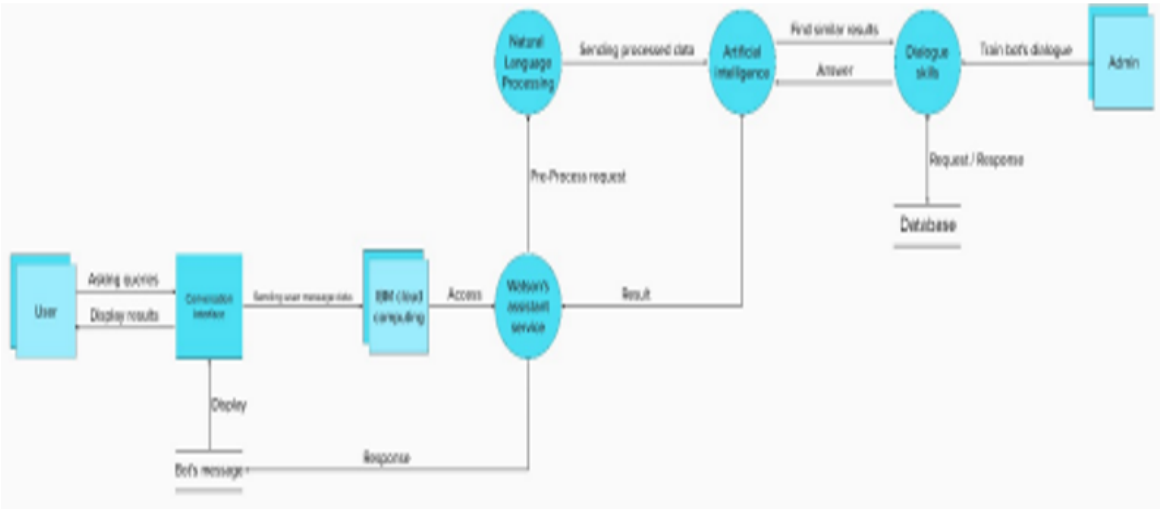
4.2 NON-FUNCTIONAL REQUIREMENTS

FR No.	Non-Functional Requirements	Description
1	Usability	To answer questions and help 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.
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.
3	Reliability	Since delivering dependable performance and information to users is seen to be crucial when employing chatbot-based services, reliability is described as a user's opinion that a chatbot service has the capacity to provide the promised service dependably and accurately. Users consider the accuracy of the information supplied by chatbot services to be a key element.
4	Performance	The speed of the chatbot has to be faster than the time it would take a human to compose the reply. The chatbot should be connected to a knowledge-based database and set up to retrieve data quickly.
5	Availability	Chatbots ought to be awake all the time and not grow weary. 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.
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. 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.

CHAPTER 5
PROJECT DESIGN

5.1 DATA FLOW DIAGRAM

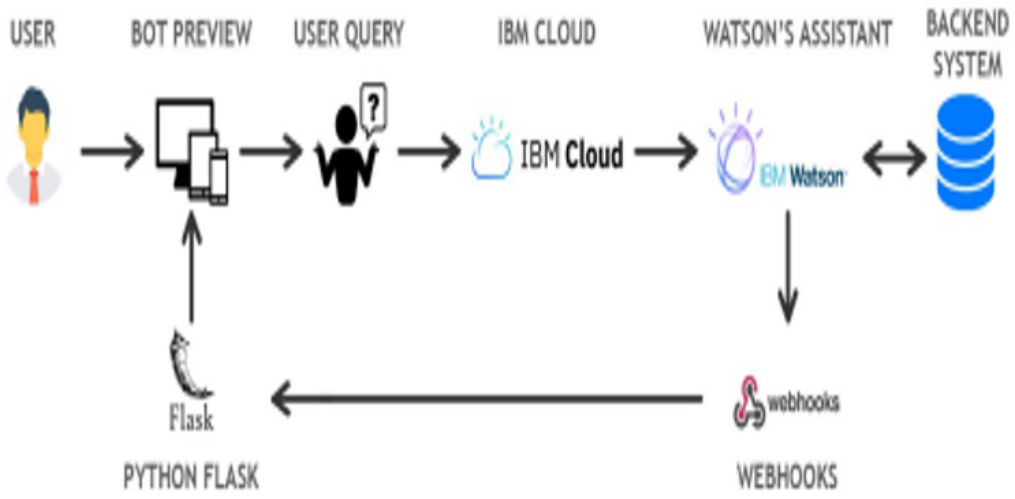
A data flow diagram (DFD) is **a graphical or visual representation using a standardized set of symbols and notations to describe a business's operations through data movement**. They are often elements of a formal methodology such as Structured Systems Analysis and Design Method (SSADM)



5.2 SOLUTION & TECHNICAL ARCHITECTURE

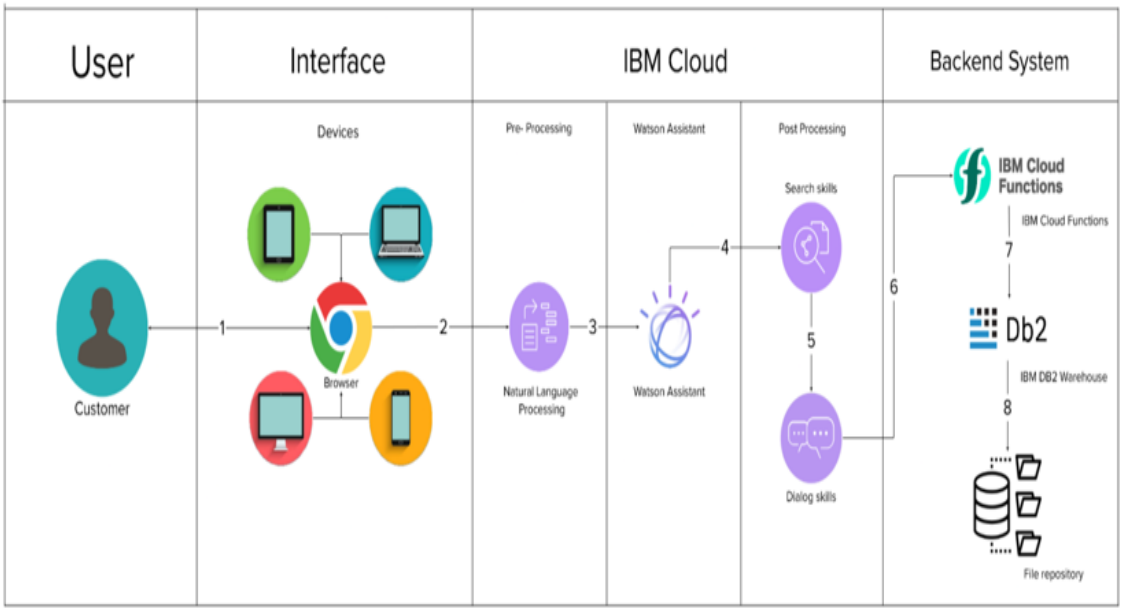
5.2.1 Solution architecture

A solution architecture (SA) is **an architectural description of a specific solution**. SAs combine guidance from different enterprise architecture viewpoints (business, information and technical), as well as from the enterprise solution architecture (ESA). The solution architecture **helps ensure that a new system will fit the existing enterprise environment**. To perform this task, a solution architect has to understand how all parts of the business model work together including processes, operating systems, and application architectures



5.2.2 Technical architecture

Technical Architecture (TA) is **a form of IT architecture that is used to design computer systems**. It involves the development of a technical blueprint with regard to the arrangement, interaction, and interdependence of all elements so that system-relevant requirements are met.



5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer	Dashboard	USN- 1	As a user, I need to access the chatbot very quickly without registration	I can question the virtual assistance	Medium	Sprint-1
Customer Care Executive	Creating Skills & Assistant for Chatbot	USN- 2	As a user, I want a chatbot to be able to greet, suggest queries and end of the conversation properly	I can start a conversation with chatbot	Medium	Sprint-1
Customer Care Executive	Creating Skills & Assistant for Chatbot	USN- 3	As a user, I want the chatbot to guide me through the creation of a savings account	I can inquire about opening a savings account.	High	Sprint-2
Customer Care Executive	Creating skills & Assistant for Chatbot	USN- 4	As a user, I want the chatbot to guide me through the creation of a current account	I can inquire about opening a current account.	High	Sprint-2
Customer Care Executive	Creating Skill & Assistant for Chatbot	USN- 5	As a user, I want the chatbot to be able to answer loan queries	I can ask a chatbot about loan questions.	High	Sprint-2
Customer Care Executive	Creating Skills & Assistant for Chatbot	USN- 6	As a user, I want the chatbot to be able to answer general banking queries	I can ask a chatbot about general banking questions.	High	Sprint-3
Customer Care Executive	Creating Skills & Assistant for Chatbot	USN- 7	As a user, I want the chatbot to be able to answer queries regarding net banking	I can ask a chatbot about net-banking questions.	High	Sprint-3

Customer Care Executive	Deployment	USN- 8	As a user, I want to access the chatbot in my web browser as well as in our local browser	I can access the chatbot in my browser	Medium	Sprint-4
Administrator	Moderation	USN-9	As an admin, I will moderate the chatbot responses	Ican moderate chatbot responses	Medium	Sprint-4
Administrator	Moderation	USN-10	As an admin, I can add an inquiry and its appropriate response to the chatbot	I can add an inquiry and answers to the chatbot	Medium	Sprint-4

CHAPTER 6

PROJECT PLANNING AND SCHEDULING

6.1 SPRINT PLANNING AND EXECUTION

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Member
Sprint-1	Dashboard	USN- 1	As a user, I need to access the chatbot very quickly without registration / Create IBM Watson Assistant Service	10	Medium	KEERDHANA K
Sprint-1	Chatbot Skills	USN-2	As a user, I want a chatbot to be able to greet, suggest relevant queries, and end the conversation properly / Create greetings, query suggestions, and end-of conversation skills	10	Medium	JAMES SALOMAN J
Sprint-2	Chatbot Skills	USN-3	As a user, I want the chatbot to guide me through the creation of a savings account / Creating Saving Account Action	7	High	JAMES SALOMAN J
Sprint-2	Chatbot Skills	USN-4	As a user, I want the chatbot to guide me through the creation of a current account / Creating Current Account	7	High	KEERDHANA K

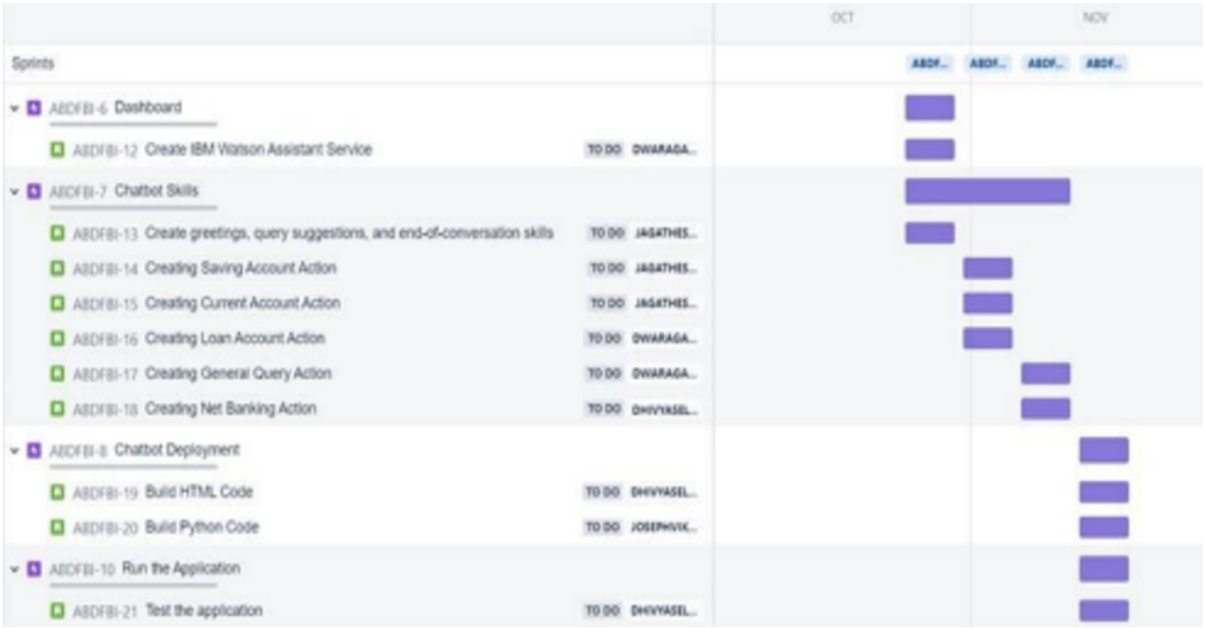
			Action			
Sprint-2	Chatbot Skills	USN-5	As a user, I want the chatbot to be able to answer loan queries / Creating Loan Account Action	6	High	KEERDHANA K
Sprint3	Chatbot Skills	USN-6	As a user, I want the chatbot to be able to answer general banking queries / Creating General Query Action	10	High	KEERDHANA K
Sprint-3	Chatbot Skills	USN-7	As a user, I want the chatbot to be able to answer queries regarding net banking / Creating Net Banking Action	10	High	SWATHI K
Sprint-4	Chatbot Deployment (HTML Website)	USN-8	As a user, I want to access the chatbot in my web browser / Build HTML Code	7	Medium	SWATHI K
Sprint-4	Chatbot Deployment (Python Flask)	USN- 9	As a user, I want the application to run in our local browser with a user interface / Build Python Code	7	Low	PRATHAB J
Sprint-4	Run the Application	USN-10	As a user, I want to use the final product of the chatbot / Test the application	6	Medium	PRATHAB J

6.2 SPRINT DELIVERY SCHEDULE

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint -1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

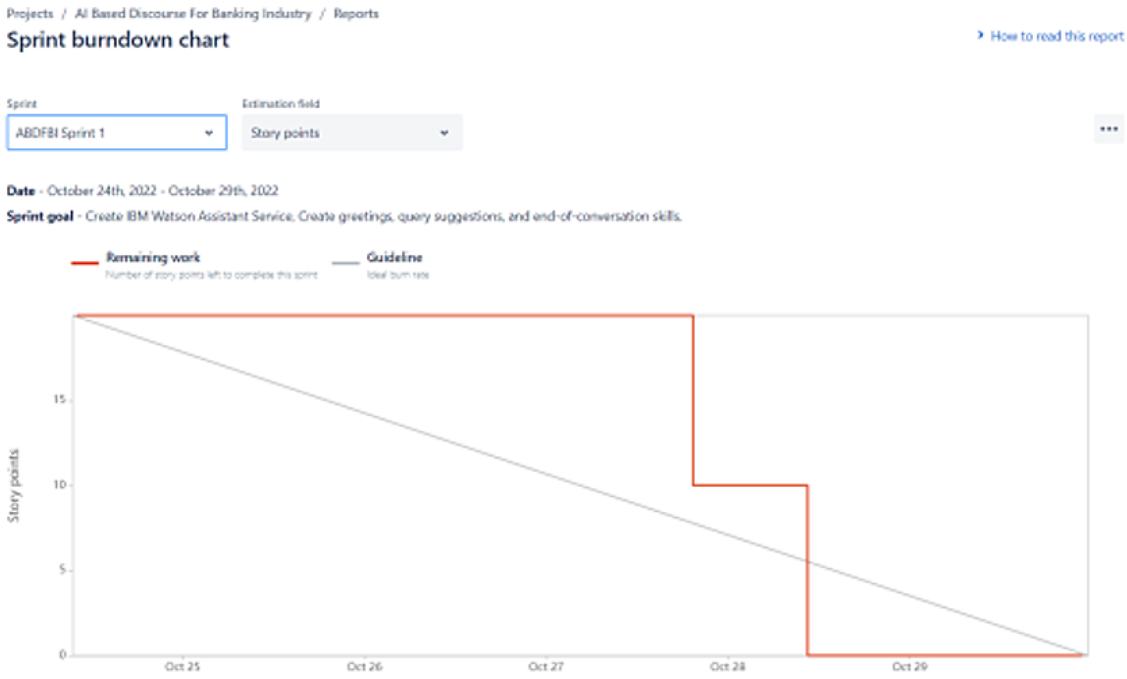
6.3 REPORT FROM JIRA

ROADMAP

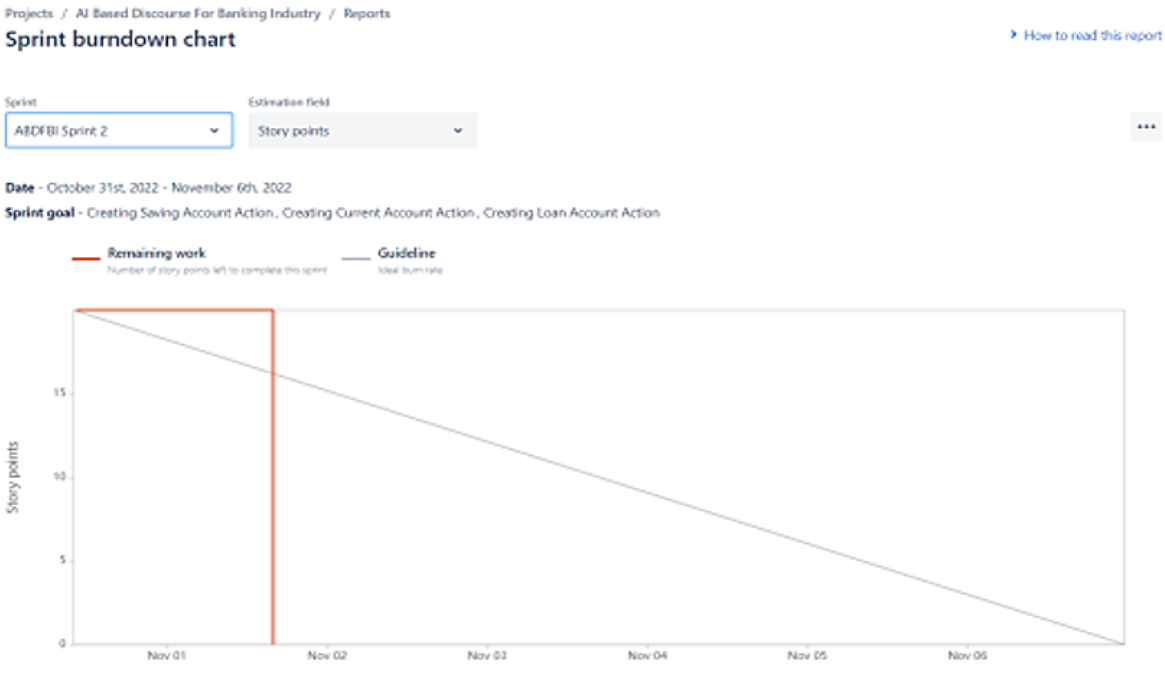


BURNDOWN CHART SPRINT 1

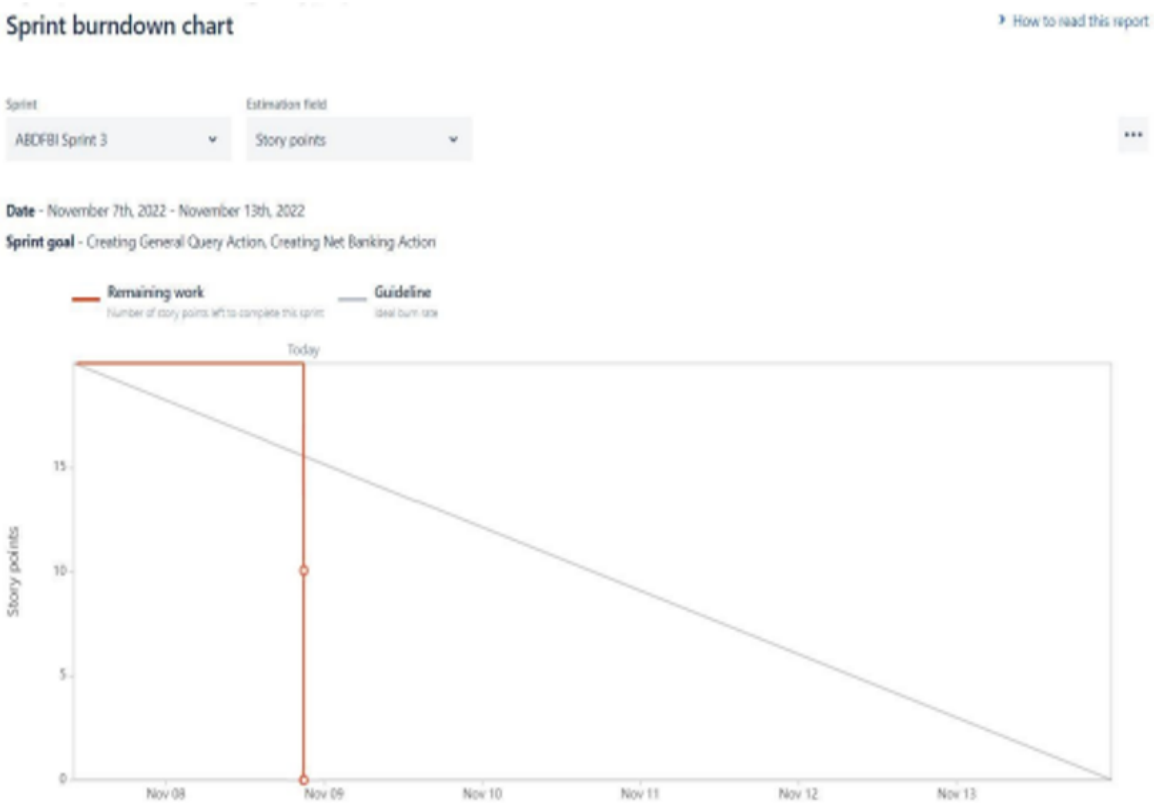
BURNDOWN CHART SPRINT-1



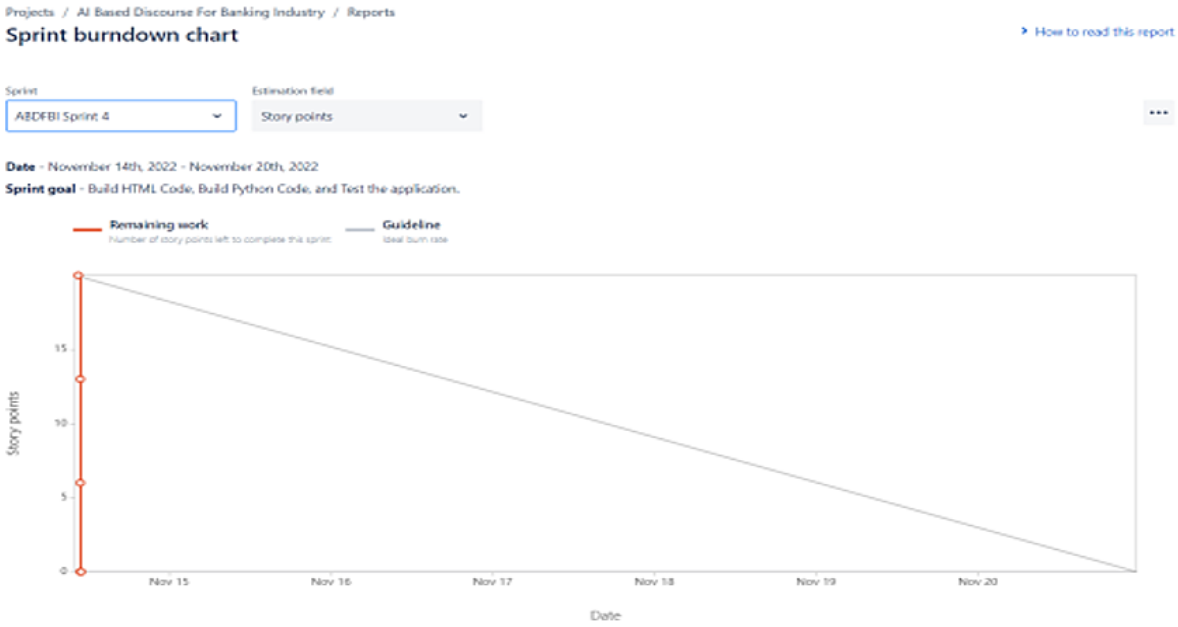
BURNDOWN CHART SPRINT 2



BURNDOWN CHART SPRINT 3



BURNDOWN CHART SPRINT 4



CHAPTER 7

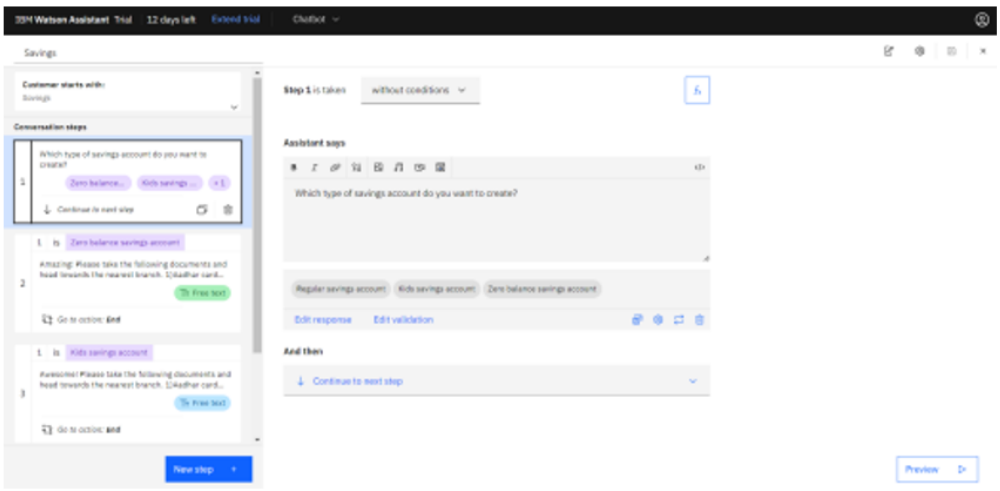
CODING AND SOLUTONS

7.1 CHATBOT SKILL CREATION

The chatbot is trained to suggest a list of FAQs, which the user can select from drop-down list.

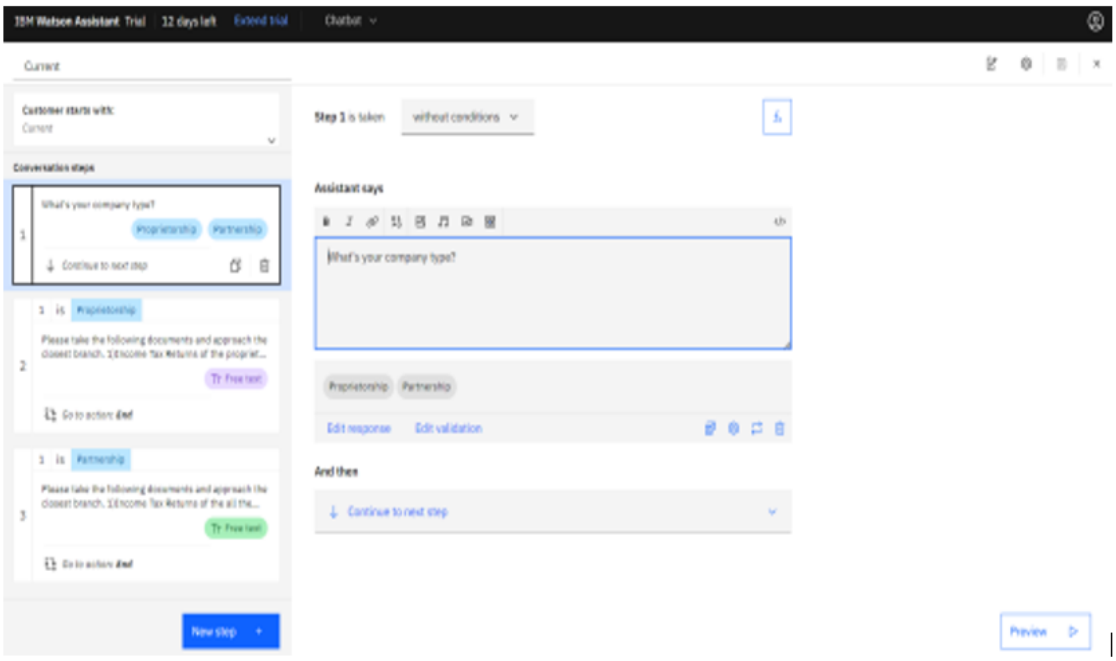
7.2 SAVING ACCOUNT ACTION

The chatbot is trained to assist users in opening savings accounts by presenting a variety of options in a drop-down menu



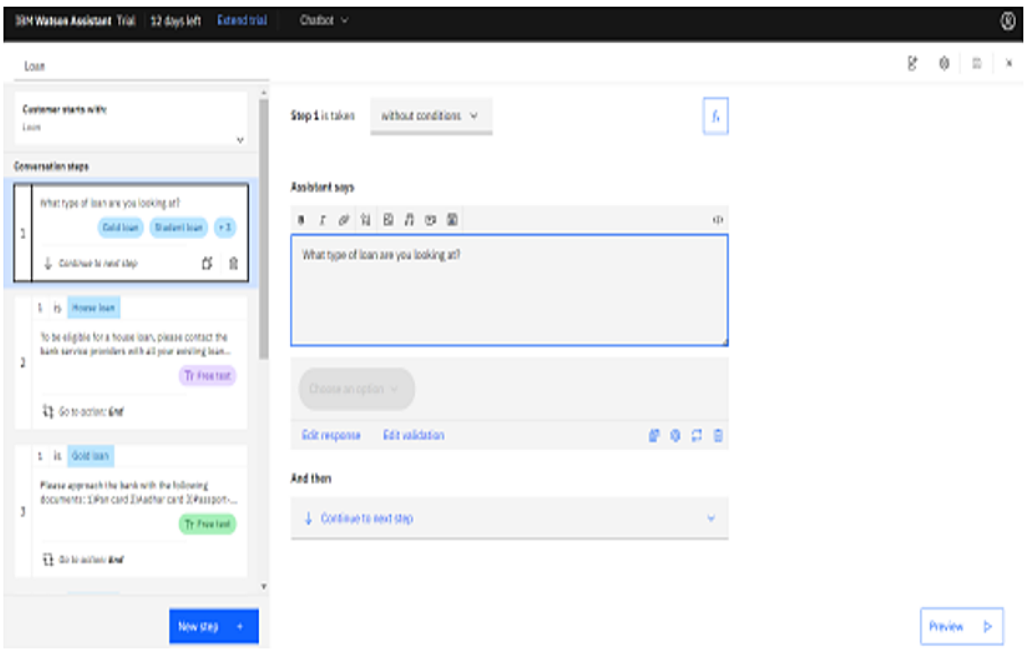
7.3 CURRENT ACCOUNT ACTION

The chatbot is trained to help customers open current accounts by offering a variety of options via a drop-down menu.



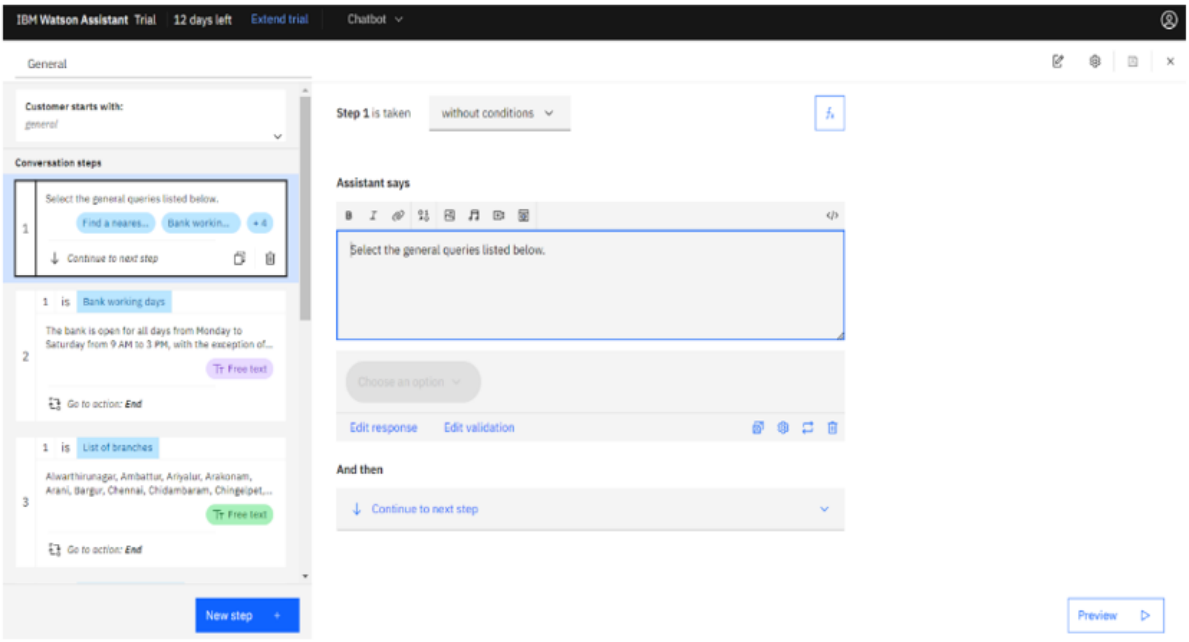
7.4 LOAN ACCOUNT ACTION

The chatbot has been trained to offer customers a variety of options to clarify their loan questions via a drop-down menu.



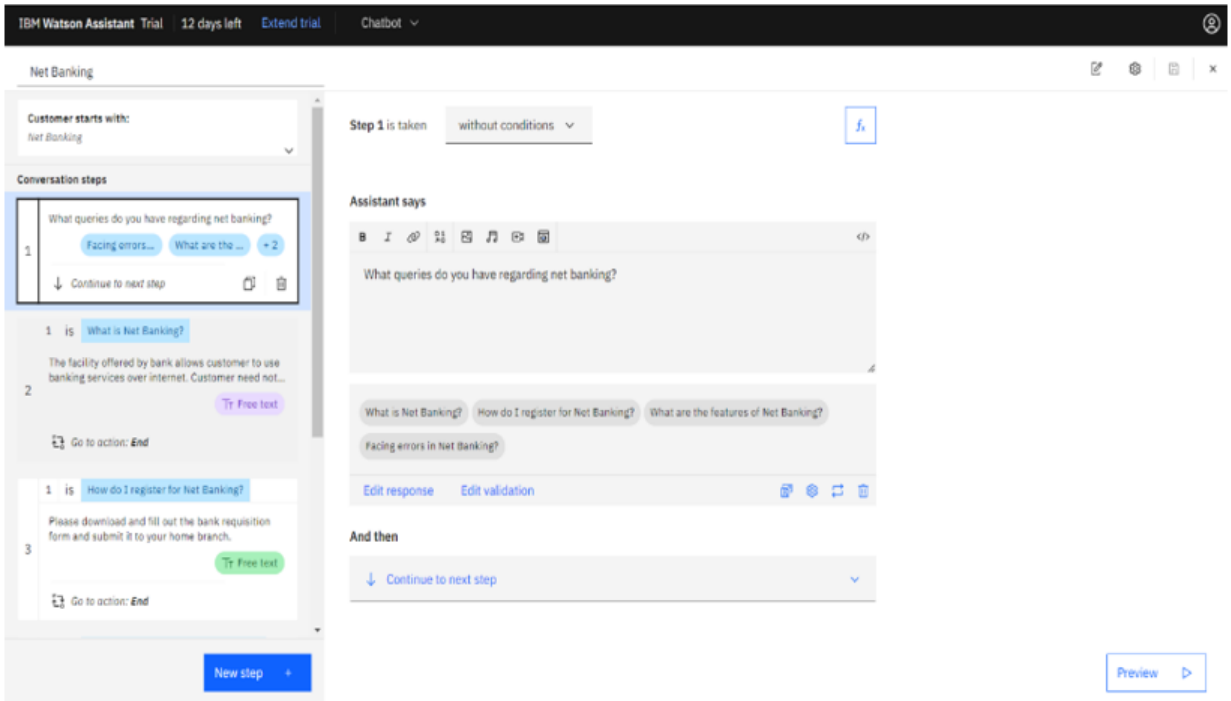
7.5 GENERAL QUERY ACTION

The chatbot has been trained to offer customers a variety of options to clarify their general questions via a drop-down menu.



7.6 NET BANKING ACTION

The chatbot has been trained to offer customers a variety of options to clarify their net banking questions via a drop-down menu.



7.7 HTML & PYTHON CODE

HTML

In this project, HTML coding is solely utilised to display the chatbot, and Watson Assistant is successfully integrated with the webpage using JavaScript. Using the URL, background images were added to the webpage.

```
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Banking Chatbot</title>
    <style>
      body{
        margin:0px;
      }
    </style>
</head>
<body>
  <img src="https://apptunix.wpenginepowered.com/blog/wp-
content/uploads/sites/3/2021/04/show-chatbots-for-banking.jpg" width= "100%"
height="100%">
  <script>
    window.watsonAssistantChatOptions = {
      integrationID: "ae0f9217-668d-4bf7-a600-5554746f8bf3",
      region: "au-syd",
      serviceInstanceID: "3588054f-8f31-4f51-977a-31b2b502e7e2",
      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

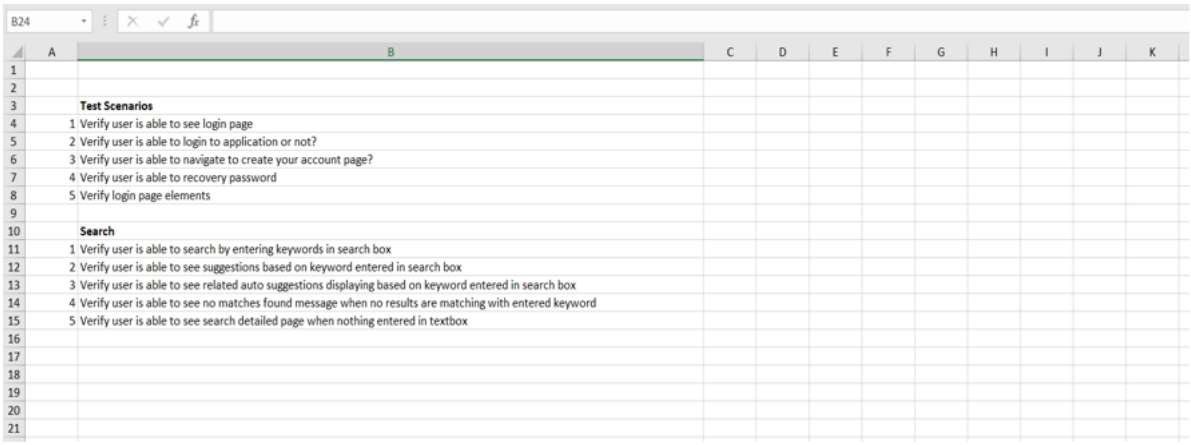
Python Flask is used for hosting the Watson Assistant chatbot webpage on a local machine.

```python
from flask import Flask, render_template


app = Flask(__name__, template_folder='templates')


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


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

CHAPTER 8

TESTING

8.1 TEST CASES



	A	B
1		
2		
3		**Test Scenarios**
4	1	Verify user is able to see login page
5	2	Verify user is able to login to application or not?
6	3	Verify user is able to navigate to create your account page?
7	4	Verify user is able to recovery password
8	5	Verify login page elements
9		
10		**Search**
11	1	Verify user is able to search by entering keywords in search box
12	2	Verify user is able to see suggestions based on keyword entered in search box
13	3	Verify user is able to see related auto suggestions displaying based on keyword entered in search box
14	4	Verify user is able to see no matches found message when no results are matching with entered keyword
15	5	Verify user is able to see search detailed page when nothing entered in textbox
16		
17		
18		
19		
20		
21		

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	**Severity 1**	**Severity 2**	**Severity 3**	**Severity 4**	**Subtotal**
By Design	7	0	0	2	9
Duplicate	0	0	0	0	0
External	0	0	0	0	0
Fixed	0	3	2	2	7
Not Reproduced	2	3	2	2	9
Skipped	1	1	1	1	4
Won't Fix	0	0	0	0	0

TEST CASE ANALYSIS

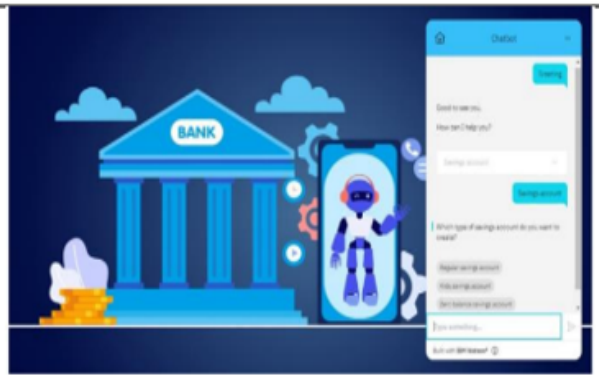
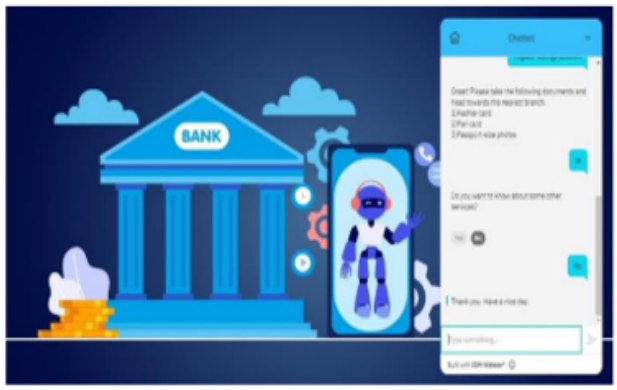
This report shows the number of test cases that have passed, failed, and untested.

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	4	0	0	4
Client Application	29	0	0	29
Security	1	0	0	1
Outsource Shipping	2	0	0	2
Exception Reporting	5	0	0	5
Final Report Output	2	0	0	2
Version Control	1	0	0	1

CHAPTER 9

RESULTS

9.1 PERFORMANCE METRICES

S.No.	Parameter	Values	Screenshot
1.	Model Summary	-	 
2.	Accuracy	Training Accuracy - 95% Validation Accuracy - 90%	This project doesn't support any model or model-based programs. So, there is no model output to submit. The training and validation accuracy have approximate value based on NLP

CHAPTER 10

ADVANTAGES

1.Chatbots have 24/7 Availability - One of the biggest benefits of using chatbots in the banking industry is that it offers 24/7 availability for your customers.

2.Reduce costs - Chatbot is relatively cost-effective and requires basic up-gradation or maintenance costs instead of employee remunerations. They also solve a lot more customer queries in a given time which can ultimately profit organizations.

3.Easy to use - Unlike banking applications, the chatbot does not require customers to download anything. They are simple to use and offer personalised features for a pleasant customer experience.

4.Personalized Banking Experience - Personalized services tailored to a customer's individual needs are the latest trend among customers.

5.Enhance Customer Service - The future of digital banking is conversational AI chatbots. With the advent of banking chatbots, certain essential aspects of customer care and support – such as speed, access to information, and pleasant encounters – are more feasible.

6.Decreased wait times - Chatbots don't just eliminate waits for simple questions. Since chatbots can resolve more than 91% of chats from start to finish without human intervention. With chatbots handling simple customer inquiries, agents can more quickly respond to complex issues that need human intervention.

7. **Improved support efficiency** - Users prefer to interact with chatbots over human agents is their incredibly efficient support. A single AI chatbot can handle an unlimited number of chats at once, responding to each chat without delay.

8.Answer Basic Questions - Chatbots can answer several fundamental questions regarding the accounts of customers or banking products.

9. **Faster customer support:** Connecting to customer representatives of banks can sometimes take a long time. Chatbots can help users get the answer they want without waiting for the available

10. **Feedback Collection** - Long feedback forms and surveys can be a nuisance to complete. A chatbot can engage customers with its natural language understanding and generation. And collect feedback with simple steps.

DISADVANTAGES

1. Questions must be programmed beforehand - When customers use chatbots, they need to ask questions in specific ways to be able to get accurate answers. Chatbots can only answer questions that have been programmed previously. This downside, however, can be eliminated by connecting an effective live agent solution to your CX strategy and adding unresolved questions to your chatbot's knowledge base.

2. **Impersonal** - Most Chatbots use structured flows to provide answers. This can make the experience robotic and feel less personal. Answers that are 100% scripted, don't allow flexibility when it comes to regionalisms and different ways of asking questions.

3. **Must Keep Information Up-To-Date** - Chatbots without artificial intelligence can only provide your customers with answers to questions that they already know. It is up to you to input new information for chatbots to use. If you don't keep this information up to-date, your chatbot may be sending incorrect messages to your customers.

4. **Technology Issues** - There can also be some technical issues when it comes to using chatbots for banking. First, chatbots require your customers to use the internet. If you have customers that do not have access to the internet or are unsure of how to use an online platform, it may not be an ideal customer service solution.

5. Chatbots are not able to give the right answer unless questions are asked exactly how they are set up to interpret user input.

6. **Higher Capacity for Misunderstanding**-When a customer's question isn't clear or is too specific, a bot may have a hard time helping, which is one of the biggest disadvantages of chatbots.

7. **Limited Functionality** - Chatbots were created to respond to simple questions that can be answered with facts. Chatbots have limited responses, so they're not often able to answer multi-part questions or questions that require decisions.

8. **Lack of human emotion and intelligence** - Chatbots still fall behind on human emotions in specific situations and can seem robotic while answering certain complex questions. Fortunately, this gap is decreasing by the day with new and advanced programs.

9. It requires the internet and as such may not be a solution for all of your customers.

10. Chatbots are not known to be able to interpret multiple questions asked at once.

CHAPTER 11

CONCLUSIONS

The latest innovations in artificial intelligence are making it possible to create chatbots that can carry on a conversation with humans even when they aren't under direct human control. This means that they will be able to respond to your questions and requests in increasingly lifelike ways. They will become more secure, capable, and versatile over time as they gain more features and capabilities. Whether you need customer service or need help behind the scenes, the AI chatbots of the future will be accessible and trustworthy communication tools. Chatbots are quickly becoming popular in the banking industry. They are not only employed to answer client questions but also to provide a variety of services. Chatbots are also becoming smarter as natural language processing and machine learning are integrated. By assisting consumers around the clock, they let banking personnel focus on other critical activities.

As a result, we can argue that chatbots have become an indispensable part of the banking system. The administrator must train the chatbot system with information about client questions and broaden the scope of its knowledge base in order to make the responses provided by the chatbot system more accurate and useful. The ultimate in user query response is the banking chatbot. Unlike banking applications, the chatbot does not require customers to download anything. It can help users get the answer they want without waiting for the available customer representative. It can answer several fundamental questions regarding the account-related queries of customers. This will help with cost efficiency and make the customer experience more real. Therefore, the future of chatbots in banking is more virtual than in-person. We can conclude that the role chatbots play in the banking sector will only continue to rise due to the constant improvements being made to their logic and the increased demand for a better customer experience.

CHAPTER 12
FUTURE ENHANCEMENT

Future development will include finishing the foundation and adding more chatbot features. The future system would be a first step toward implementing an intelligent question management programme capable of not only responding but also self-learning to improve itself in subsequent stages, thus not only increasing the quality of user service but also reducing human loads, increasing productivity, and, of course, increasing the number of satisfied users. It can be improved further by including multilingualism and speech recognition. As the website develops, we will be able to add many more tags to the data collection. After the conversation, the chat history of a specific user can be emailed to him or her. This can be accomplished by authorising the users and receiving their email addresses. This project is a minor endeavour to make the website more user-friendly and understandable to the user. We may also improve the chatbot by incorporating responses derived not just from the existing list of FAQs but also from a variety of other sources, such as the internet, databases, and other data sources. We may provide specific recommendations as well as demonstrations of responses in the form of photos, links, and videos.

It all depends on what you expect from them. If you are waiting for a bot that can carry on a conversation like a human being, that is not going to happen in the nearest future. **AI bots are still in the early stages of development and are not yet capable of human-like conversation.** Users can immediately see when they talk to a piece of software and can get annoyed with that. **In fact, *86%* of people prefer humans to AI bots.** You can also check out *this article* to see the advantages and disadvantages of AI bots and rule-based bots.

Therefore, it’s all about what you want from a chatbot. They are not yet ready to replace human beings, but if you do not expect them to, they do their job. Chatbot development is now on the rise with different types of chatbots created for different purposes, and we can expect wider chatbot adoption everywhere.

CHAPTER 13

APPENDIX

SOURCE CODE

HTML

```
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Banking Chatbot</title>
    <style>
      body{
        margin:0px;
      }
    </style>
</head>
<body>
  <img src="https://apptunix.wpenginepowered.com/blog/wp-
content/uploads/sites/3/2021/04/show-chatbots-for-banking.jpg" width= "100%"
height="100%">
  <script>
    window.watsonAssistantChatOptions = {
      integrationID: "ae0f9217-668d-4bf7-a600-5554746f8bf3",
      region: "au-syd",
      serviceInstanceID: "3588054f-8f31-4f51-977a-31b2b502e7e2",
      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

```python
from flask import Flask, render_template


app = Flask(__name__, template_folder='templates')


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


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

LINK :

GitHub : https://github.com/IBM-EPBL/IBM-Project-9973-1659085645

Demo link :

https://drive.google.com/file/d/1onS1Hvi_gQewinzpGly_ovI4CWyykjtf/view?usp=share_link