AI BASED DISCOURSE FOR BANKING INDUSTRY

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Contents

1. INTRODUCTION

In today's world as humble citizens, we find the use and proper management of money to be of top priority. It is conclusive that banks help us in storing, managing and using our hard earned money efficiently, but the process of using these banks and making the best use of the aid provided by them is only possible when the customer/end-user has a proper understanding of the services provided.
It is undeniable how much the field of artificial intelligence has helped in providing human-like assistance through technology. Hence it is only wise that we incorporate the mechanisms of artificial intelligence to provide human-like assistance to bank clients and help them use the available banking services efficiently.

1.1 Project Overview

Our project "AI based discourse for banking industry" aims to build a smart chatbot that could seamlessly respond to basic bank related queries and assist the client. The project makes use of IBM's Watson assistant to build the chatbot, and firebase to deploy our website along the chatbot.

1.2 Purpose

The main purpose of our project is to improve the quality of customer care services of a particular bank by making available a smart chatbot to answer basic queries promptly. The availability of such a chatbot also reduces the burden on customer care services which are handled by humans and hence are error prone and time inefficient.

2. LITERATURE SURVEY

2.1 Existing problem

The Existing Conventional Banking System has many Challenges and Problems which needs to be looked upon. The Net Banking User Interface is quite complex which is difficult for Users/Customers to interact with and do various functionalities like Creation of Account,debiting and crediting. Conventional Customer Care Methods are bane to users.

2.1.1 Application of artificial intelligence for successful strategy implementation in india's banking sector

This paper proposes how the impact of the recent major events like demonetization and government sponsored initiatives of developing digital India have not only encouraged India‟s economy to become cashless, but also brought in a massive amount of data in banks, demanding quick, accurate and consistent updation & maintenance of records.

Having traversed the wide literature reviewed on this topic of interest, this study identified the potentials of AI for achieving successful implementation of strategies in India‟s banking sector because AI understands the workflow of the banking system and restructures the processes to automate the same.

AI is a promising technology, researchers were able to gather rich literature from various data sources, tracking & analyzing its evaluation, business opportunities, applications etc. and thoroughly analyzed the contribution of various scholars, to find connect with the research objectives as described above, ultimately reaching out to the conclusions to identify the application of AI with specific reference to India‟s Banking Sector.

2.1.2 Application of artificial intelligence in banking: a study based on SBI-SIA Virtual Assistant

The main significance of this study is that Indian banks are progressively using technologies of the future in order to serve new-age clientele and expand their development potential. AI is supporting Indian banks in upgrading their operations across the board, from accounting to sales to contracts and cybersecurity.

This study is an empirical study based on secondary sources. Emerging Trends in the modern banking system and the introduction of virtual assistant by the State Bank of India to assist the banking customers to do the virtual baking is the theme of this study.

Five metrics are considered as most important tools for the impact analysis of SBI- SIA. Number of customers saved in first month, Interaction per second, Total Number of hours and Support operation in a month are the key metrics used to analyse the impact of SBI- Virtual Assistant (SIA). The following metrics values show the impact of virtual banking and importance of virtual banking in India.

2.1.3 Chatbot response mining using sentiment analysis

This paper proposes how the existing Chatbots or bot assistants are mainly voice based yet face hitches in understanding the intentions of the user and hence become difficult to handle situations. Also these chatbots are unable to keep track of the context and suffer in long-ranging conversations, problem now is that the algorithms powering them are not sensitive enough to handle any situation, thus understanding context and sentiments are essential.

The ChatBot dataset for the present study is retrieved from Kaggle [1]. The data consists of 80 responses received for the query “Describe a time when you have acted as a resource for someone else?” asked by therapy ChatBot. There are two types of responses: ‘*flagged’* and ‘*not flagged’*. ‘*flagged’* denotes the user is referred to help whereas ‘not flagged’ means the user can continue talking to the bot

Sentiment Analysis of responses received by the ChatBot intends to comprehend the sentiments of the writer and what they think about the question. The present analysis is

carried on R, machine learning environment. 80 responses for the query asked by ChatBot is considered as dataset for the present analysis. There are two types of responses: ‘flagged’ and ‘not flagged’. The analysis is carried out for these two classes of data separately and the emotions are compared.

2.1.4 Survey on intelligent chatbots: state-of-the-art and future research directions

This paper proposes chatbots can help customers find useful information for their needs. Thus, numerous organizations are using chatbots to automate their customer service. Thus, the need for using artificial intelligence has been increasing due to the needs of automated services.

This paper has used three large publishers’ databases for identifying research articles on chatbots. These are IEEE, ScienceDirect and Springer. These databases provide a good assortment of peer reviewed articles in the fields of Natural Language Processing, Artificial Intelligence, and Human-Computer Interaction.

AI models, contrary to Rule-based models, are based on Machine Learning algorithms that allow them to learn from an existing database of human conversations. In order to do so, they need to be trained through Machine Learning algorithms that can train the model using a training dataset. Through the use of Machine Learning algorithms, there is no longer the need to manually define and code new pattern matching rules, which allows chatbots to be more flexible and no longer dependent on domain specific knowledge. As stated, AI models can be further categorised into Information Retrieval based models and Generative models

2.1.5 A STUDY ON ARTIFICIAL INTELLIGENCE (AI) IN BANKING AND FINANCIAL SERVICES

The study is descriptive in nature and is based on secondary data. The data are collected from various reports, journals, news articles, various bank portals, and RBI portal and internet sources. There are two main currents in artificial intelligence. Conventional A.I. and Computational Intelligence.
Conventional artificial intelligence is divided into machine learning and statistics. This is also called symbol based, logical, neat A.I. and good old fashioned A.I. It involves an Expert system - This system draws conclusions using causality. This system concludes by analyzing a huge amount of information. Case based reasoning. Basin network. Behavior based intelligence - Departmental method of creating man-made artificial intelligence .

Allowing methods: The computer intelligence method involves frequent sequential creation or learning. Education is based on assumed information and deals with non-symbolic, scruffy A.I. and soft computing. Efforts are also underway to create a hybrid intelligence by combining these two main groups. The rules of proof can be made using highly specialized nerve networks or the rules of creation can be made using statistically trained systems. Artificial Intelligence

Amplification This method suggests how artificial intelligence can be created from the effects of technology on enhancing human intelligence.

2.1.6 THE INFLUENCE OF ARTIFICIAL INTELLIGENCE ON THE BANKING INDUSTRY & HOW AI IS CHANGING THE FACE OF MODERN DAY BANKS

This research mainly focuses on the concept of AI in the field of banking, how it has brought revolutionary changes in banking and its impact on human manpower. As we are aware that humans tend to commit errors, but the world is evolving, so do the innovations, there is a lack of skilled talents required to handle the automation. Several routine and manual tasks which were earlier performed by humans are now being replaced by automated machines with advanced technology.

Given that the business is experiencing noteworthy change at a quick pace, this research is a preview of the current applications of AI in the banking industry and how it is changing the face of banking in India.

The data gathered is Primary data and Secondary data, which is both quantitative and qualitative data, which was further analyzed in order to draw conclusions and suggestions. Primary data was gathered through a survey on awareness of individuals about use of artificial intelligence in the banking sector. A questionnaire was drafted for the survey and random sampling was done. Secondary data collection was done through the internet which includes web, e-magazines, research papers, e-books, newspapers etc.

Fraud detection is one of the fields which has received a massive boost in providing accurate and apt results with the intervention of artificial intelligence. Fraud has been the major issue in the financial sector and fraud detection is one of the crucial areas in the banking sector where artificial intelligence systems have excelled the most. AI helps to gain a better understanding of customer’s behavior thus helps in better detection of new and emerging frauds.

2.2 References

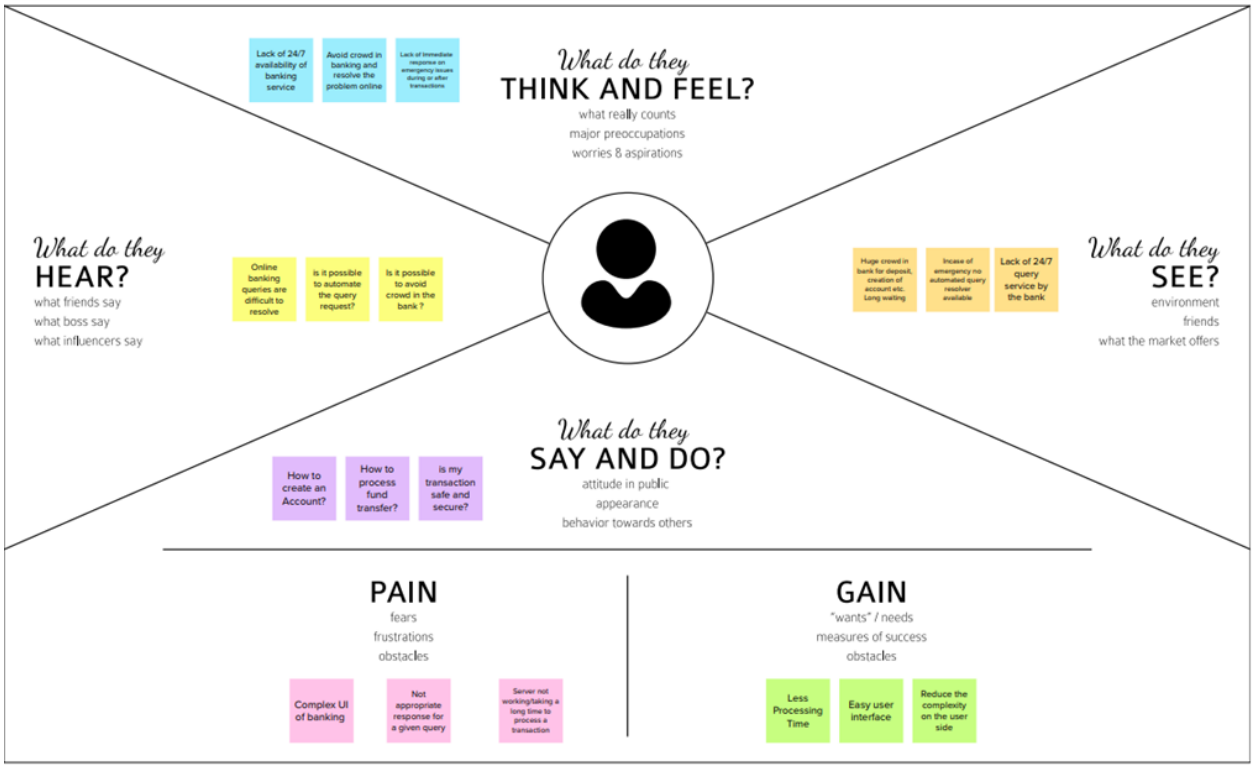
1) Application of artificial intelligence for successful strategy implementation in India's banking sector -Ms. Bhavna Agarwal, Dr. Himanshu Agarwal and Dr. Parvez Talib.-November 2019
2) Application of artificial intelligence in banking: a study based on SBI-SIA Virtual Assistant -2020
3) Chatbot response mining using sentiment analysis- R.S. Kamath, S.S. Jamsandekar M.B. Patil-January 2020

4) Survey on intelligent chatbots: state-of-the-art and future research directions-Ebtesam H. Almansor & Farookh Khadeer Hussain-January 2020
5) A STUDY ON ARTIFICIAL INTELLIGENCE (AI) IN BANKING AND FINANCIAL SERVICES-Dr. Lakshkaushik Dattatraya Puri-September 2021
6) THE INFLUENCE OF ARTIFICIAL INTELLIGENCE ON THE BANKING INDUSTRY & HOW AI IS CHANGING THE FACE OF MODERN DAY BANKS-Dr. Navleen Kaur Supriya Lamba Sahdev Dr. Monika Sharma Laraibe Siddiqui-June 2020

2.3 Problem Statement Definition

3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas



3.2 Ideation & Brainstorming

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

Before you collaborate

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

10 minutes

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

B **Set the goal**
Think about the problem you'll be focusing on solving in the brainstorming session.

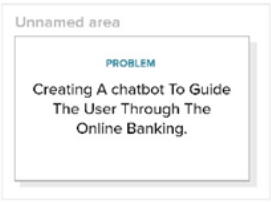
C **Learn how to use the facilitation tools**
Use the Facilitation Superpowers to run a happy and productive session.

Open article →

Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

5 minutes



Step-2: Brainstorm, Idea Listing and Grouping

2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

10 minutes

Person 1

- Manually identify existing issues with the GUI
- Identify FAQ's
- Use chatbot to solve problems using NLP
- Customer Insights

Person 2

- What are the actual problems faced by the customers
- Customer Analysis
- Conversation Summary
- Route queries that can only be answered by humans to customer service

Person 3

- Sentimental Analysis
- Fast Response
- Provide standard verified solutions to problems
- Allow only authorized queries (chatbot should not reveal sensitive data about the bank)

Person 4

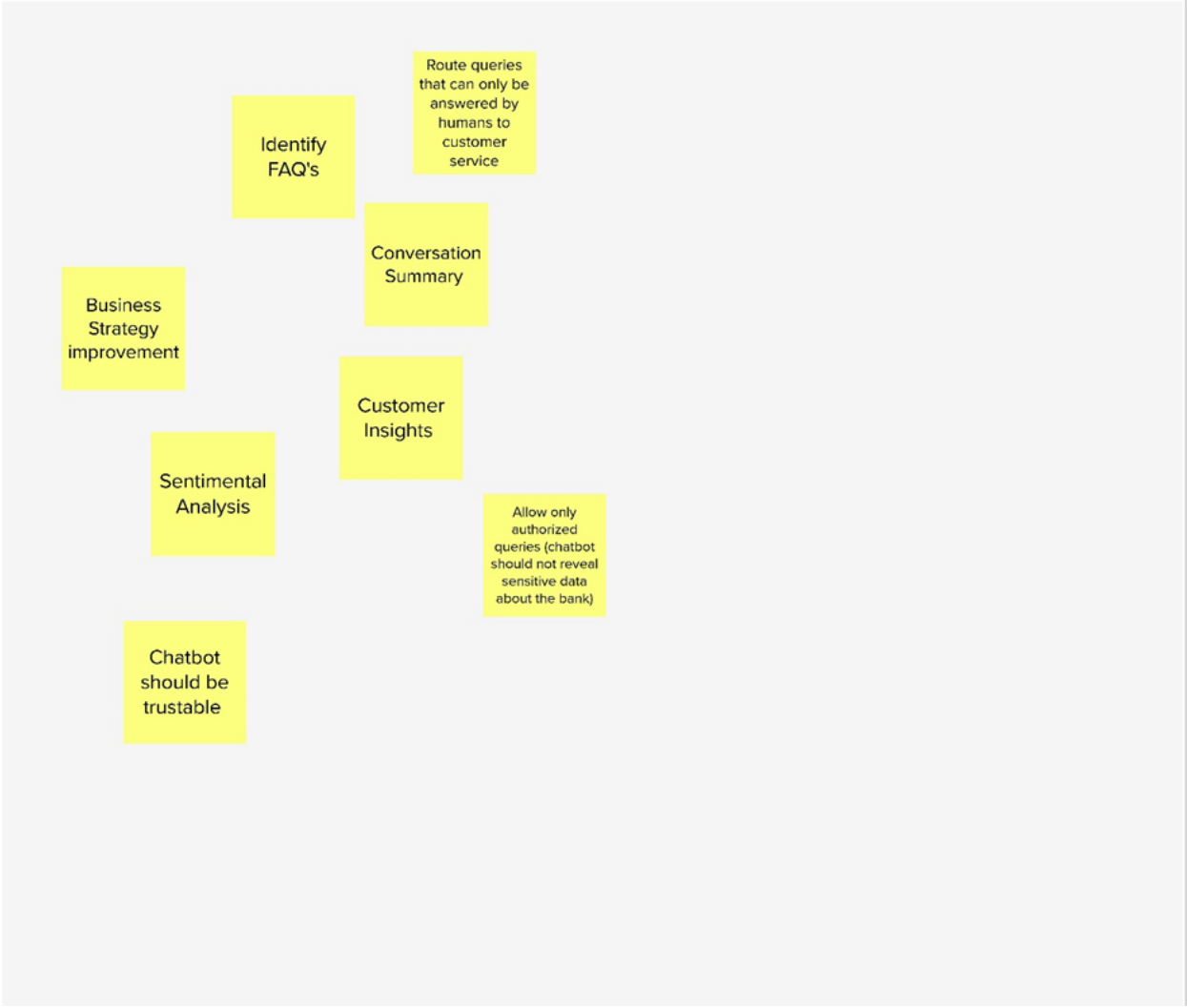
- Business Strategy improvement
- Feedback Analysis
- Chatbot should be trustable
- Chatbot should be available at all times

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

20 minutes



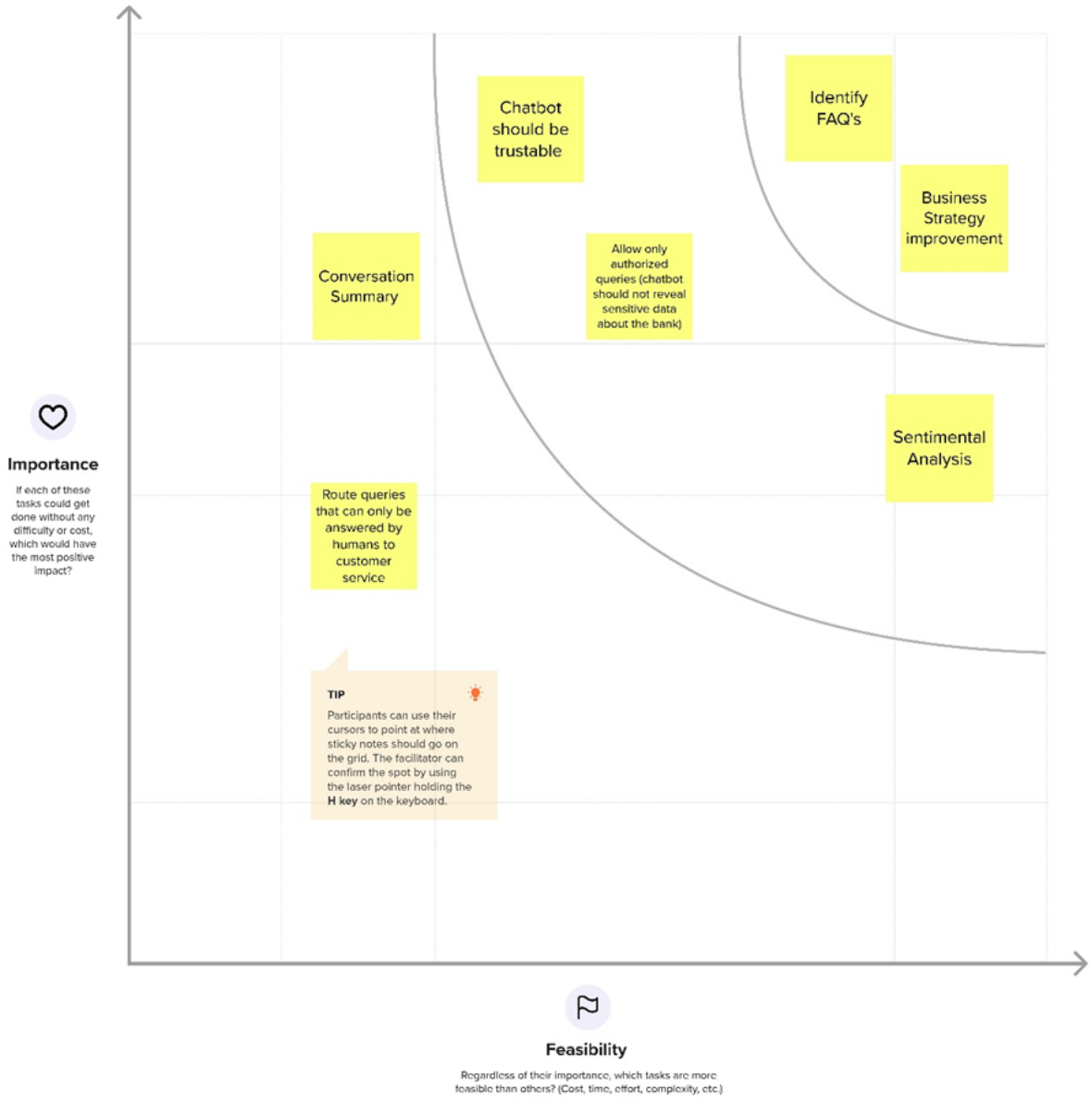
Step-3: Idea Prioritization

4

Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes

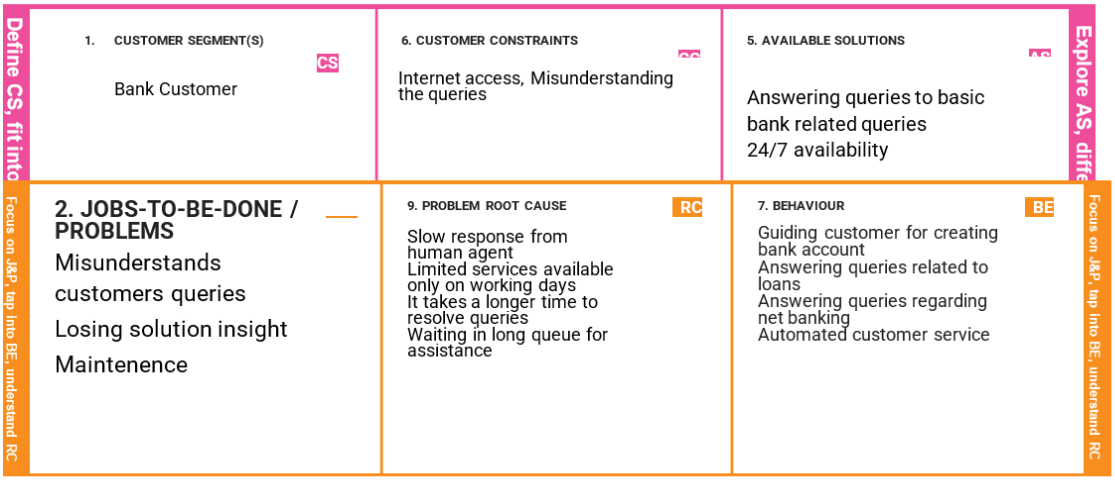


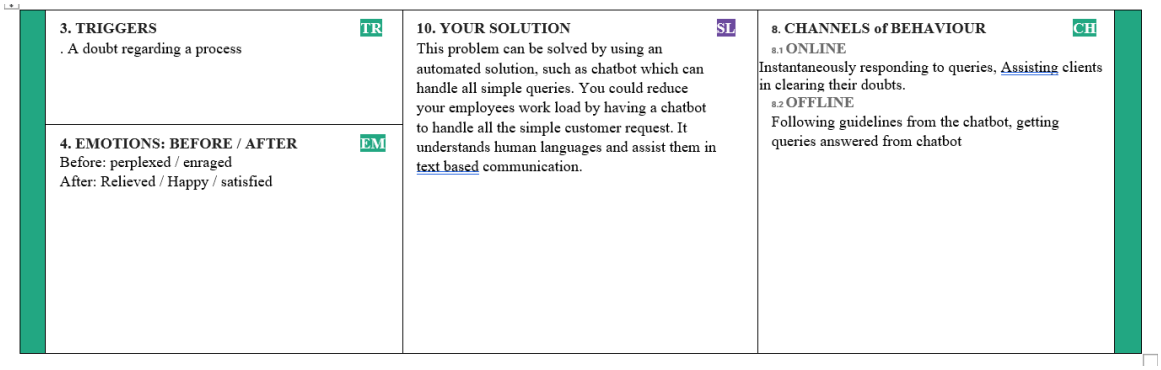
3.3 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	
2.	Idea / Solution description	· Available around the clock for conversation with customers · Instant answers to questions · Capable of remembering the individual customers interaction on the banking website · Handle huge number of customers without any inconveniences · Learning from customers feedback and enhance the working of bank · Sales of banking products using bots · Reduces the workload for bank employers
3.	Novelty / Uniqueness	· The proposed project works on providing the above features. With automation, Banking queries can easy be solved within seconds and is available around the clock and many customers queries can be solved concurrently. · We are aiming to extend the base idea by collecting the feedbacks from the customers and process that data to understand the negative feedbacks that help improvise the current banking nature. This would help the bank improve

		their performance to satisfy the customer needs.
4.	Social Impact / Customer Satisfaction	• Better customer satisfaction • Personalized experience for each customer • 24/7 availability • Instant and apt solutions for he queries
5.	Business Model (Revenue Model)	
6.	Scalability of the Solution	. Usually, the customer details are not retained by the chatbot, to improve customer satisfaction chatbot an ideal solution would be to incorporate customer query history and to enhance the quality of the chatbot.

3.4 Problem Solution fit





4. REQUIREMENT ANALYSIS

4.1 Functional requirement

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Greetings	· To introduce the functions of the bot with a pop-up message that greets the user and gives instructions.
FR-2	Account creation	· Explain about how to create a bank account: documents required, procedure etc.
FR-3	Support Provided	· FAQ's · Queries related to net banking loan Savings account creation Checking balance of the account

FR-4	Feedback	· To improve quality of the bot · A separate form to collect feedback from customers

4.2 Non-Functional requirements

Following are the non-functional requirements of the proposed solution.

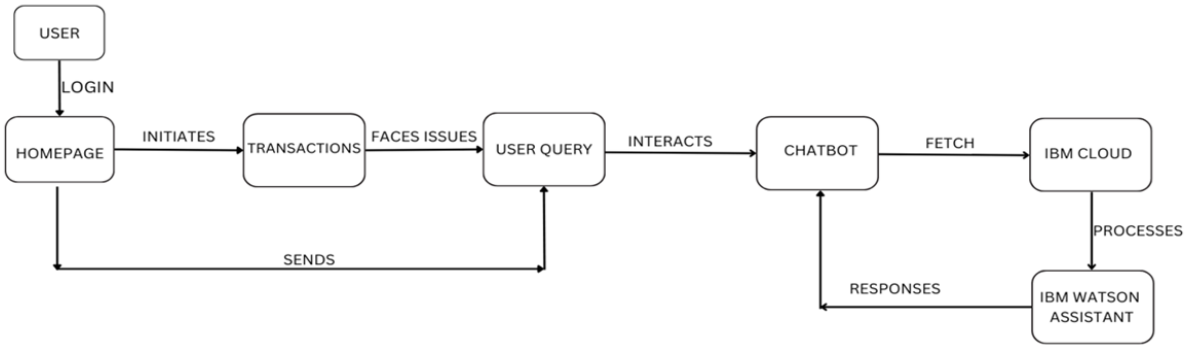
FR No.	**Non-Functional Requirement**	**Description**
NFR-1	**Usability**	· Answering user queries · GUI friendly
NFR-2	**Security**	· Encryption · Prevent unauthorized access · Provide details only with respect to their account · No human intervention hence better security. · Protect sensitive data access from illegal users
NFR-3	**Reliability**	· 24X7 access · More accurate · Fast response · Availability
NFR-4	**Performance**	· Accuracy · Personalized · Instant response

NFR-5	**Availability**	· Available around the clock · Functions even during holidays
NFR-6	**Scalability**	· To help business growth and scale with ease and best in terms of profit. · IBM Watson Assistant also produces quick and accurate responses and meets customer's expectations. · It introduces deep and broad perspectives in the bank's global features.

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

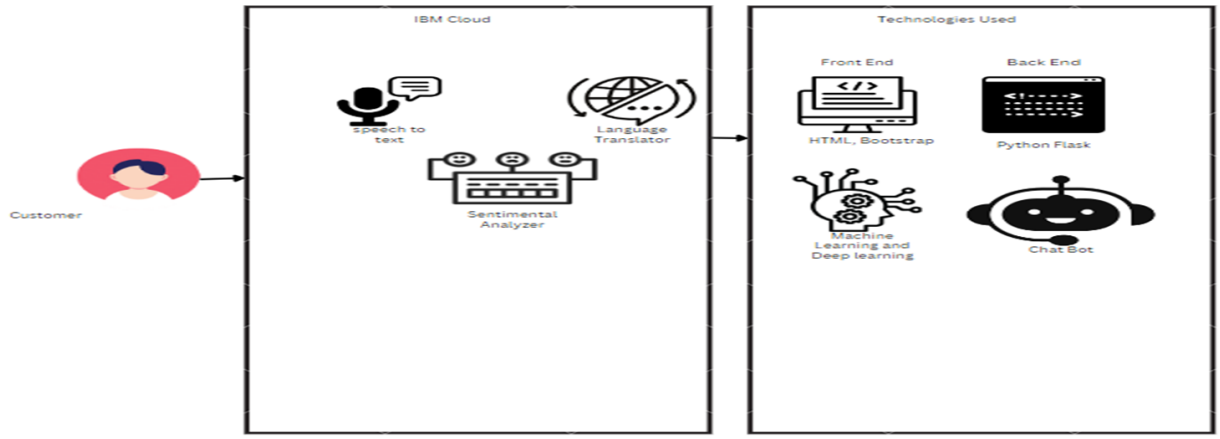


Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript
2	Application Logic-1	Chat Bot that allows to resolve the queries of the user. Automated generation of questions as the user types.	Python, IBM Watson Assistance
3	Application Logic-2	Personalized questions and frequently asked questions.	IBM Watson STT service

4	Application Logic-3	Real time fetching of data from the cloud and automated updating of user information. Improvised and customisable user interface with fresh updates and versions.	IBM Watson Assistant
5	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
6	External API-1	Users can sends query with the help of chatbot which is processed by IBM Watson Assistant and stored in IBM Cloud Database	IBM Weather API, etc.
7	External API-2	Cloud Database is secure, automatic and scalable database which is used by Watson Assistant and sends response back to the user.	Aadhar API, etc.
8	Deep Learning or NLP	It learns to execute classification task directly from text. It is used to do text in mining and pattern recognition. It also does sentimental analysis on the feedback.	Python / R
9	Infrastructure (Server / Cloud)	On the cloud server we will deploy the chat bot using python flask API	Python Flask

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1	Open-Source Frameworks	Different open source frameworks used	Bootstrap, Python flask
2	Security Implementations	Encryption, Assess Control, User authentication, authorization and other firewalls.	IBM Watson Assistant, IBM Cloudant DB
3	Scalable Architecture	The scalability consists of 3 tiers – Web server, Application server, Cloud server	Docker, IBM Watson assistance, cloud server-cloud DB
4	Availability	Available 24/7 and around the globe using load balancers and distributed servers.	IBM Cloud
5	Performance	No limit on the number of customers.	IBM Load balancer

5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile/Web user)	Bot Preview	USN-1	As a user, I can see the chatbot preview to ask inquiries, which includes a message box where I can type queries	I can access the chatbot's message box.	High	Sprint-1

		USN-2	As a user, I can view the Frequently Asked Questions (FAQ)	I get access to the Frequently Asked Questions (FAQ).	High	Sprint-1
	Updates	USN-3	As a user, I can see the updates and search for further information about them.	I can able to view and access the updates.	Medium	Sprint-2
Administrator	Edit Options	USN-4	As an admin, I can add / edit greeting messages, FAQs to the Bot.	I can access to add options like greeting messages, etc.	High	Sprint-1
		USN-5	As an admin, I have the authority to provide ideas and alternatives to the Bot.	I can deliver ideas and alternatives.	Medium	Sprint-2
		USN-6	As an admin, I can make a post regarding new updates.	I can post new updates.	Medium	Sprint-2
Developer	Support	USN-7	As a developer, I can implement Bot for bank conveniently using IBM Watson Assistant.	I can easily access Watson Assistant.	High	Sprint-1
	Upcoming Features	USN-8	As a developer, I can implement new features for the Bot.	I can able to perform new features to the bot.	Medium	Sprint-2
	Design	USN-9	As a developer, I can create as well as design the chatbot's UI.	I can design the chatbot's UI.	High	Sprint-1

6. PROJECT PLANNING & 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 an admin, I must create the required IBM service, Watson Assistant.	2	High	Varshaa KS Sreeharini ER
Sprint-1	Chatbot Skill Creation	USN-2	As an admin, I can add welcoming messages, customer care executive contact information to the bot.	3	Medium	Abirami Rathina Srividhya V
Sprint-1	Creating Saving Account Action	USN-3	As an admin, I can add a response to create a new saving account.	5	High	Abirami Rathina Srividhya V
Sprint-1	Creating Current Account Action	USN-4	As an admin, I can add a response to create a new current account.	5	High	Sreeharini ER Varshaa KS
Sprint-1	Greeting Message	USN-5	As a user, I can receive welcoming messages from the bot.	2	Low	Varshaa K.S Sreeharini ER

Sprint-2	Creating Loan Account Action	USN-6	As an admin, I can add a response to create a new loan account.	5	High	Sreeharini ER Varshaa KS
Sprint-2	Creating General Query Action	USN-7	As an admin, I can insert responses to general banking queries.	5	High	Srividhya V Abirami Rathina
Sprint-3	Creating Net-Banking Action	USN-8	As an admin, I can insert responses to net-banking queries.	5	High	Sreeharini ER Varshaa KS
Sprint-3	Integrate With Flask Webpage	USN-9	As an admin, I will integrate with the Flask webpage using Python code following the establishment of Assistant.	5	High	Varshaa KS Sreeharini ER
Sprint-3	Bot Preview	USN-10	As an admin, I employ HTML code to design the front-end of the website.	5	High	Abirami Rathina Srividhya V

Sprint	**Functional Requirement (Epic)**	**User Story Number**	**User Story / Task**	**Story Points**	**Priority**	**Team Members**

Sprint-4	Bot Preview	USN-11	As a user, I can view the bot preview, and it has a user-friendly UI.	2	High	Varshaa KS Sreeharini ER
Sprint-4	Run The Application	USN-12	An admin can also access the bot at any time.	2	High	Srividhya V Abirami Rathina
Sprint-4	Ask Queries	USN-13	As a user, I can see the bot preview asking for guidance to create a saving bank account.	2	Medium	Srividhya V Abirami Rathina
Sprint-4		USN-14	As a user, I can see the bot preview asking for guidance to create a current bank account.	2	Medium	Varshaa KS Sreeharini ER
Sprint-4		USN-15	As a user, I can type loan-related queries.	2	Medium	Srividhya V Abirami Rathina
Sprint-4		USN-16	As a user, I can type general banking queries.	2	Medium	Srividhya V Abirami Rathina
Sprint-4		USN-17	As a user, I can type net-banking queries.	2	Medium	Varshaa KS Sreeharini ER

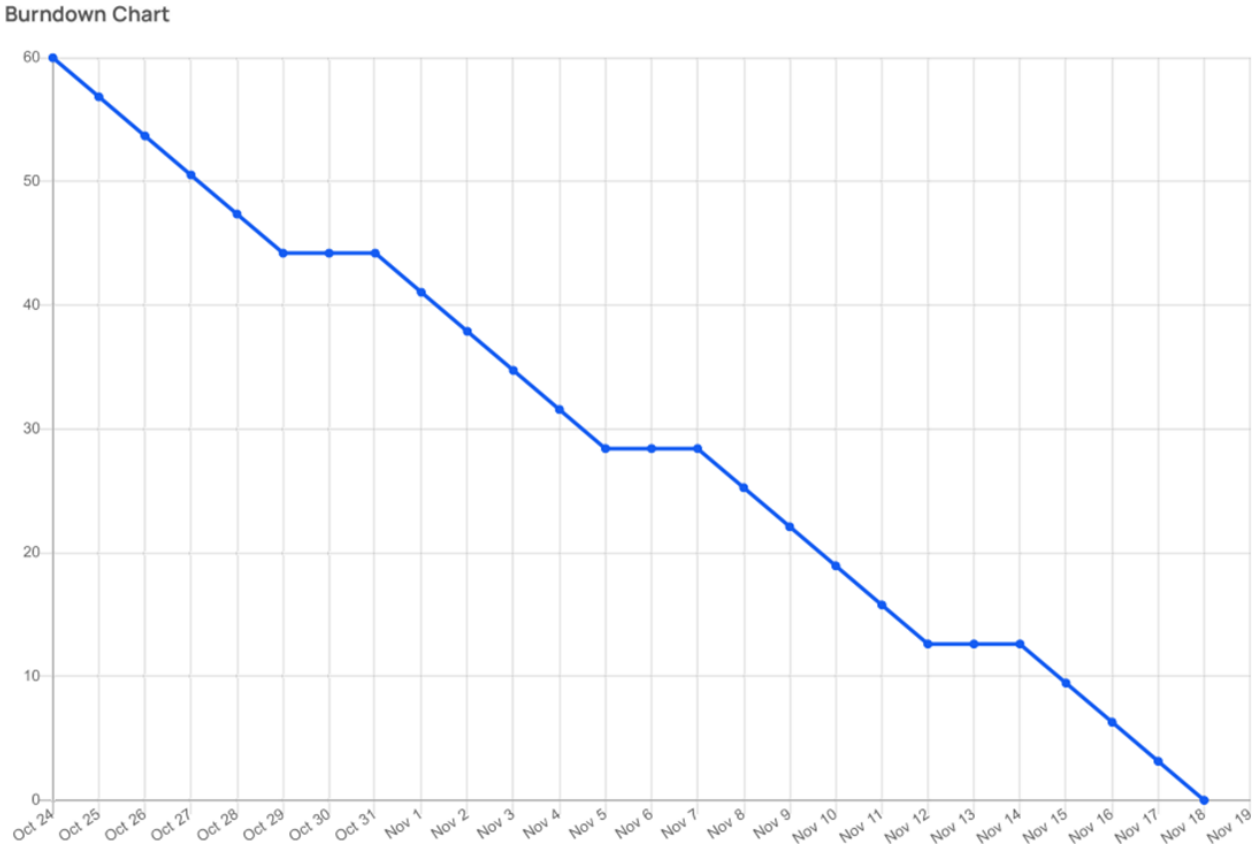
Sprint-4	Customer Support	USN-18	As a user, I can receive contact information from customer care executive through the bot.	2	Medium	Abirami Rathina Srividhya V
Sprint-4	Run The Application	USN-19	A user can access the bot at any time.	2	High	Srividhya V Abirami Rathina

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	17	6 Days	24 Oct 2022	29 Oct 2022	17	31 Oct 2022
Sprint-2	10	6 Days	31 Oct 2022	05 Nov 2022		
Sprint-3	15	6 Days	07 Nov	12 Nov 2022		

			20 22			
Spr int-4	18	6 Days	14 Nov 20 22	19 Nov 2022		

6.3 Reports from JIRA

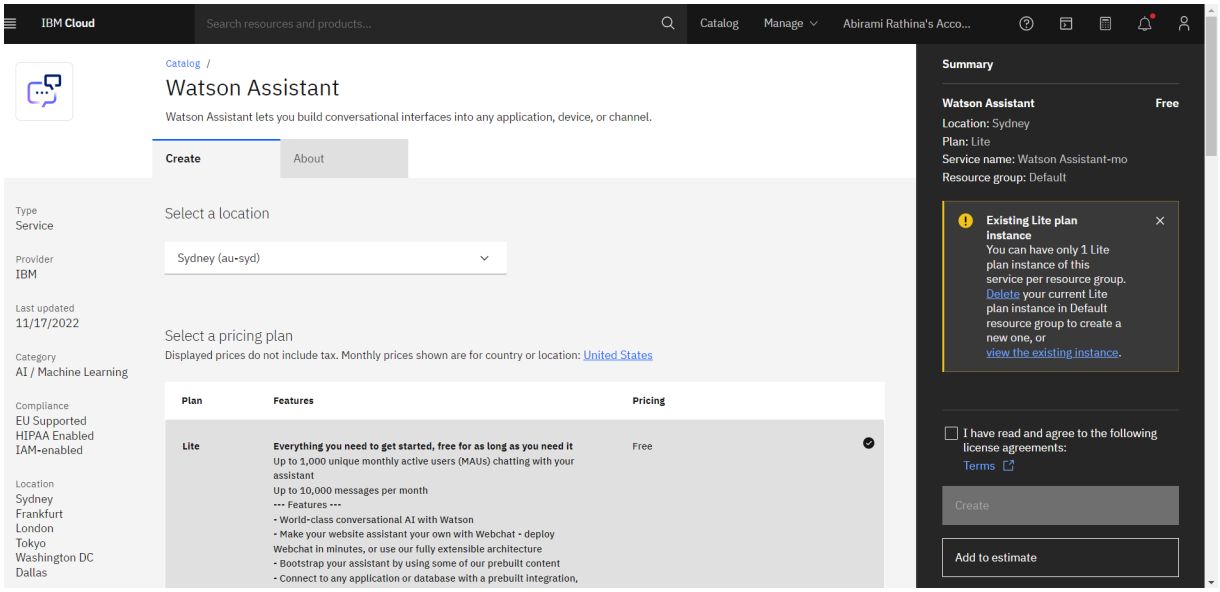


7. CODING & SOLUTIONING (Explain the features added in the project along with code)

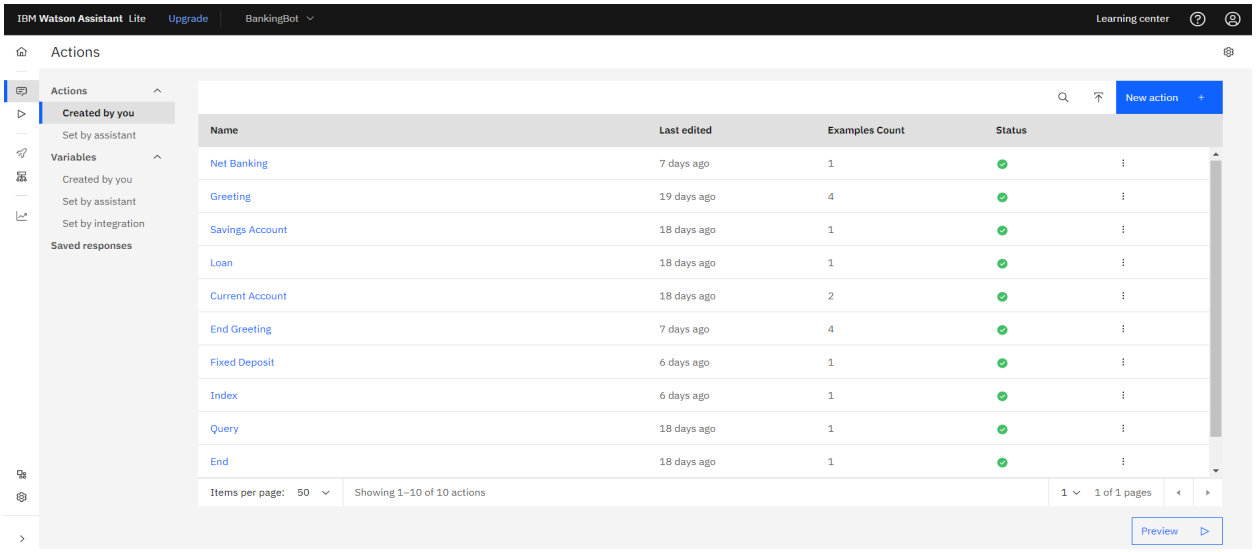
7.1 Feature 1

Building the chatbot using IBM watson assistant

1. Create IBM Watson Assistant Service



2. Create Skills for your Bot
3. Add Actions to your Bot
    a. Greetings : used to display greeting messages to the user
    b. Index : displays the list of queries
    c. Savings Account: provides details about opening a savings account
    d. Loan: provides information regarding loan
    e. NetBanking: provides information on netbanking
    f. Current Account: provides details regarding current account
    g. Fixed Deposit (added on our own): provides details about the documents required to open a fixed deposit account
    h. Query: provides details about different branches



7.2 Feature 2

Building the site and integrating the chatbot

1. Building a static website: Our site consists of
    a. home page
    b. FAQ page
    c. about page
2. Adding the bot to each page

7.3 Feature 3

Deploying the site: we have used firebase to deploy our website.

1. Create a new project of type website
2. Navigate to the hosting option
3. Install node js
4. Install requires firebase tools into our system
5. After logging into our gmail loginInitialize our project
6. Deploy the site.

8. TESTING

8.1 Test Cases

Test Case ID	Feature Type	Component	Test Scenario	Steps To Execute	Test Data	Expected Result	Actual Result	Status
HomePage_TC_OO1	UI	Home Page	Verify user is able to see the homepage when user clicks on the Get Started button	1.Enter URL (https://savbank-4a591.web.app/) and click go 2.Click on Get Started button 3.Verify homepage is displayed or not	https://savbank-4a591.web.app/	Homepage should be displayed	Working as expected	Pass
WebPage_TC_OO2	UI	FAQ Page	Verify the UI elements in FAQ page	1.Enter URL (https://savbank-4a591.web.app/) and click go 2.Click on FAQ button in the navigation bar 3.Verify FAQ page for UI element for all the questions.	https://savbank-4a591.web.app/faq/	Application should display answers when clicked on the question	Working as Expected	Pass

WebPage_TC_OO3	UI	About Page	Verify users are able to see the about page and navigate to other pages.	1.Enter URL (https://savbank-4a591.web.app/) and click go 2.Click on about page button in the navigation bar	https://savbank-4a591.web.app/about.html	Users should be able to see the about page and navigate to other pages.	Working as expected	Pass
Page_TC_OO4	Functional	Chatbot	Verify users are able to view the chatbot and verify if the chatbot is popped up when clicked on the icon.	1.Enter URL (https://savbank-4a591.web.app/) and click go 2.Click on the chatbot icon in the right bottom of the page. 3.Select the appropriate category related to the query. 4.Click on the minimize button in the top right corner of the chatbot interface to close the chatbot.		The bot responds appropriately to the query selected by the user.	Working as expected	Pass
Page_TC_OO5	Functional	Queries	Verify user is able to see the dropdown box with a list of available queries	1.Enter URL(https://savbank-4a591.web.app/) and click go 2.Click on the chatbot icon in the bottom right corner of the page. 3.Enter greetings. 4.Select the query from the dropdown list.	Greetings eg: hi, hey, hello. Queries such as, Savings Account, Loan Enquiry, NetBanking, Current Account Fixed Deposit and General Query.	Chatbot should show a dropdown list of available queries.	Working as expected	Pass
Page_TC_OO6	Functional	Subqueries	Verify users are able to see a list of subqueries for each query.	1.Enter URL(https://savbank-4a591.web.app/) and click go 2.Click on the chatbot icon in the	Query: NetBanking The following are the subqueries related to	Chatbot should show a list of available subqueries	Working as expected	Pass

				bottom right corner of the page. 3.Enter greetings. 4.Select the query from the dropdown list. 5.Select the subquery displayed for the selected query.	netbanking : 1. What is netbanking? 2. How do I register for netbanking? 3. What are the features of netbanking? 4. What are the errors faced in netbanking?	for the selected query.		
Page_TC_OO7	Functional	Content	Verify user is able to see an answer explaining the subquery selected from the list of queries.After the details have been provided, verify user is given an option to go back to the list of queries or to finish the conversation	1.Enter URL(https://savbank-4a591.web.app/) and click go 2.Click on the chatbot icon in the right bottom of the page. 3.Enter greetings. 4.Select the query from the dropdown list. 5.Select the subquery displayed for the selected query.	Subquery: what is netbanking? The facility offered by the bank allows customers to use banking services over the internet. Customers need not visit their bank's branch office to avail each and every small service.	Chatbot should show an answer explaining the selected subquery. Chatbot should also show an option whether to go back or finish the conversation.	Working as expected	Pass
Page_TC_OO8	Functional	Navigation	Verify users are able to continue the conversation while navigating across web pages.	1.Enter URL(https://savbank-4a591.web.app/) and click go 2.Click on the chatbot icon in the right bottom of the page. 3.Enter greetings. 4.Select a query from the dropdown list. 5.Navigate to a different webpage and open the chatbot.		Chatbot should continue from the conversation left in a different webpage.	Working as expected	Pass

Test Scenarios

1	Verify user is able to see home page
2	Verify user is able to see about page
3	Verify user is able to see FAQ page
4	Verify user is able to see the bot on each page
5	Verify user is able to continue the conversation across all pages

Search

1	Verify user is able to click on the drop down menu
2	Verify user is able to view the response of the bot
3	Verify user is able to continue the conversation
4	Verify user receives the right response for the query

8.2 User Acceptance Testing

User Acceptance Testing (UAT) is a type of testing performed by the end user or the client to verify/accept the software system before moving the software application to the production environment.

Defect Analysis

The table 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	1	5	7	8	21
Duplicate	1	0	0	0	1
External	2	3	0	1	6

Fixed	5	2	3	10	20
Not Reproduced	2	0	0	0	2
Skipped	0	0	0	4	4
Won't Fix	0	5	3	1	9
Totals	11	15	13	24	63

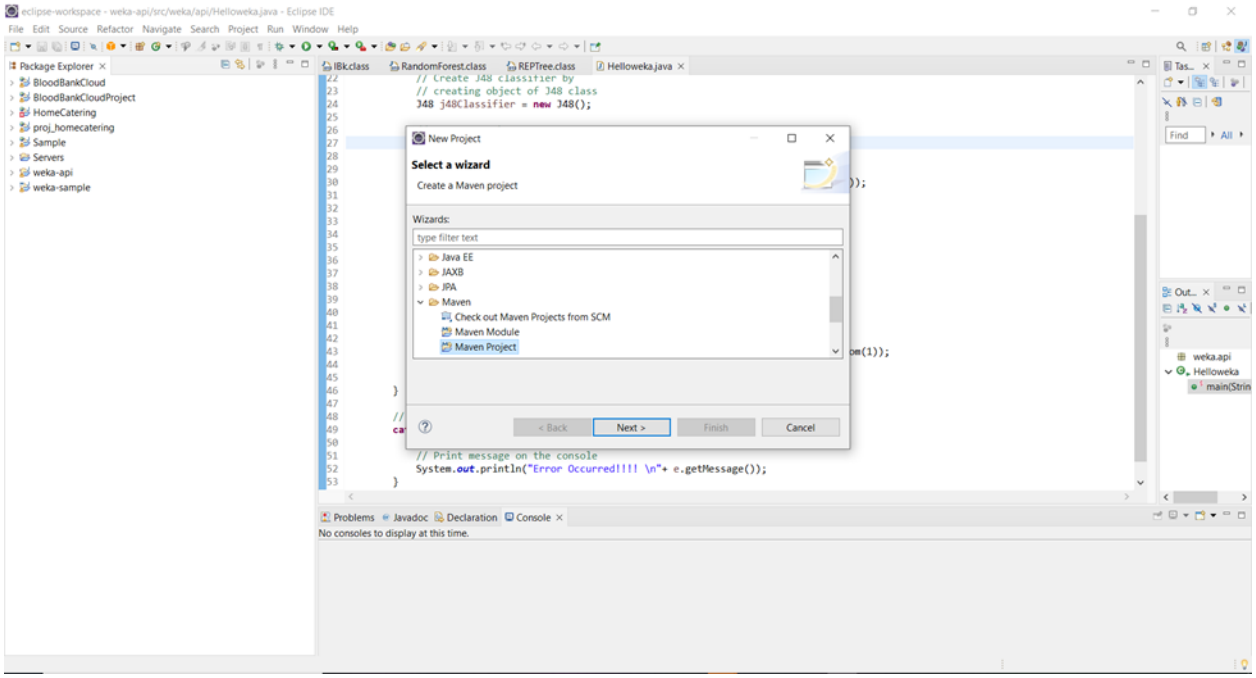
Test Case Analysis

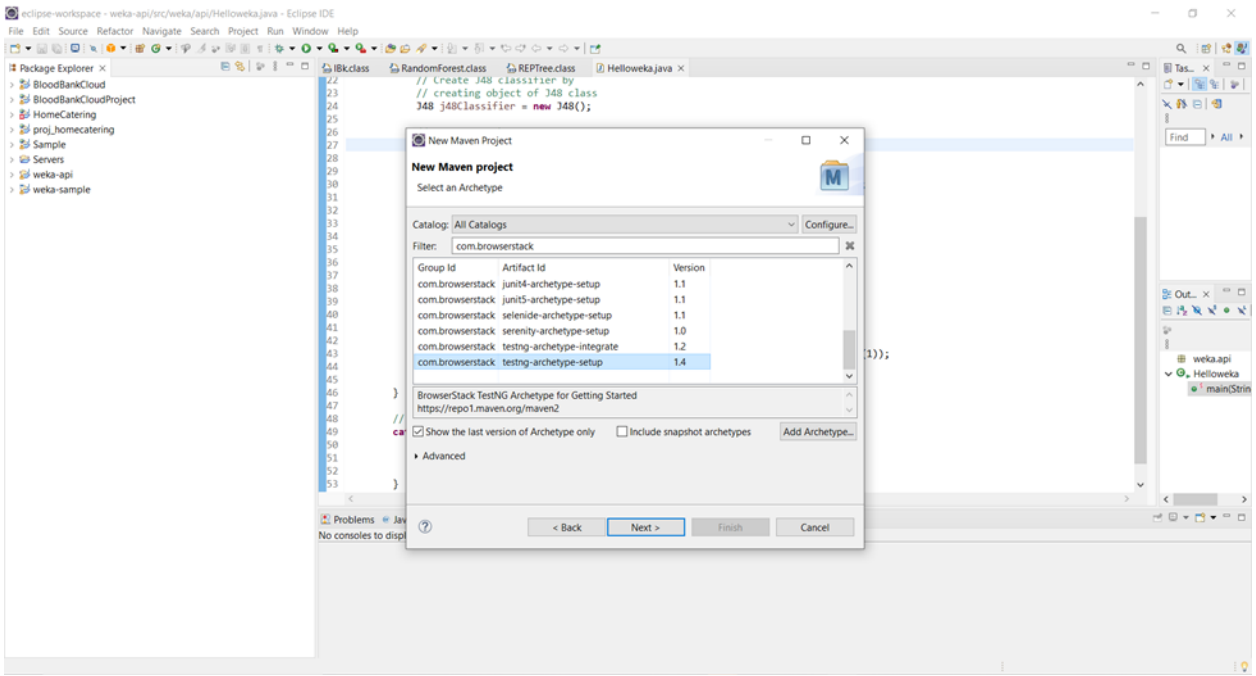
The table shows the number of test cases that have passed, failed, and untested.

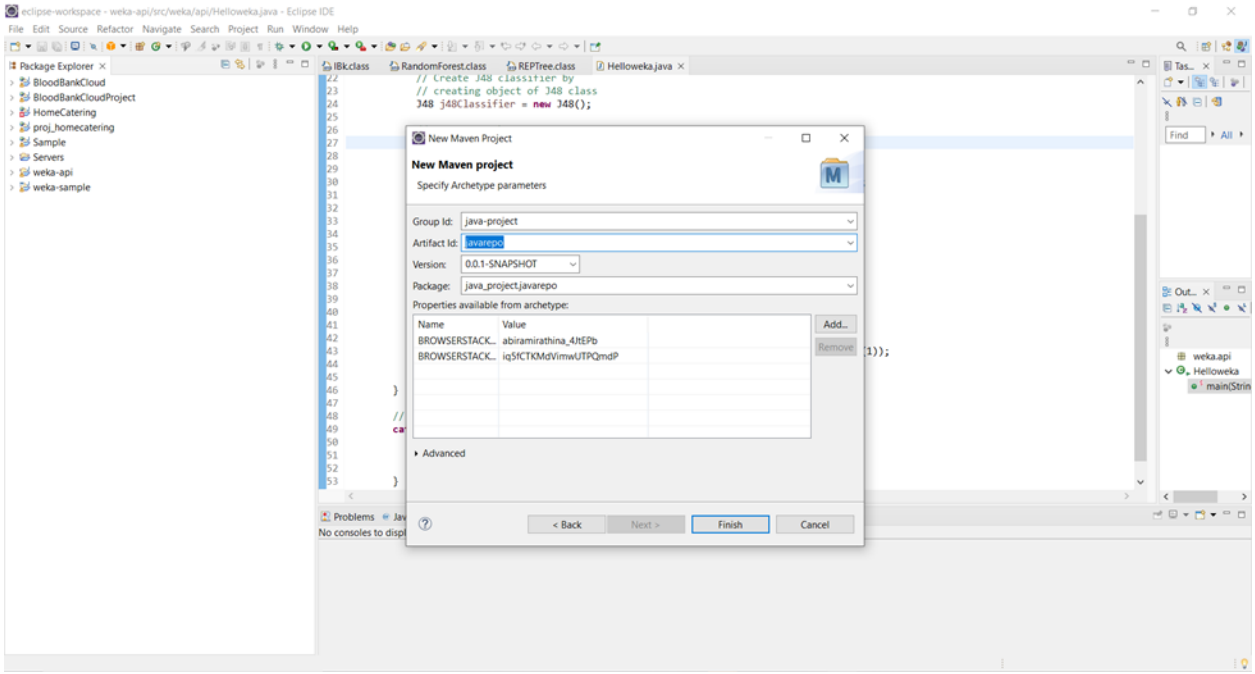
Section	Total Cases	Not Tested	Fail	Pass
Print Engine	7	0	0	7
Client Application	4	0	0	4
Security	1	0	0	1
Outsource Shipping	5	0	0	5
Exception Reporting	2	0	0	2
Final Report Output	8	0	0	8
Version Control	2	0	0	2

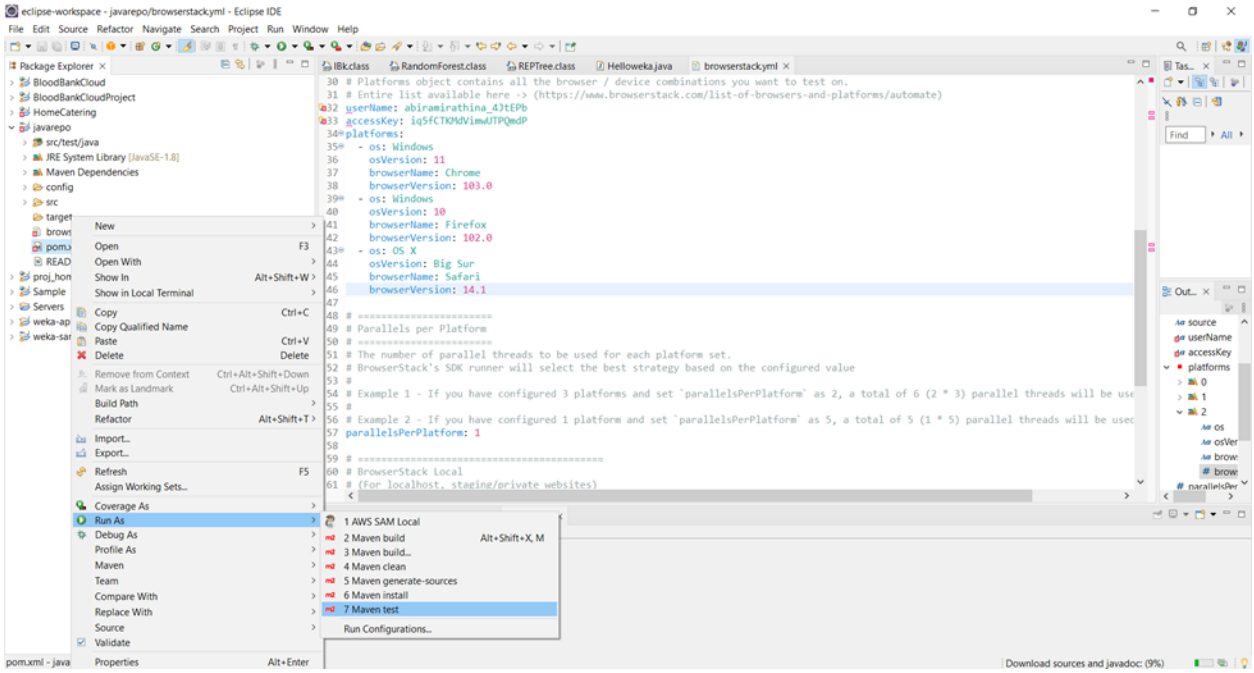
User Acceptance testing using Appium

Creating a maven project


eclipse-workspace - weka-api/src/weka/api/Helloweka.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help
Package Explorer
BloodBankCloud
BloodBankCloudProject
HomeCatering
proj_homecatering
Sample
Servers
weka-api
weka-sample
IBk.class
RandomForest.class
REPTree.class
Helloweka.java
// Create J48 classifier by
// creating object of J48 class
J48 j48Classifier = new J48();
New Project
Select a wizard
Create a Maven project
Wizards:
type filter text
Java EE
JAXB
JPA
Maven
Check out Maven Projects from SCM
Maven Module
Maven Project
< Back
Next >
Finish
Cancel
// Print message on the console
System.out.println("Error Occurred!!!! \n"+ e.getMessage());
Problems
Javadoc
Declaration
Console
No consoles to display at this time.
weka.api
Helloweka
main(Strin


eclipse-workspace - weka-api/src/weka/api/Helloweka.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help
Package Explorer
BloodBankCloud
BloodBankCloudProject
HomeCatering
proj_homecatering
Sample
Servers
weka-api
weka-sample
IBk.class
RandomForest.class
REPTree.class
Helloweka.java
// Create J48 classifier by
// creating object of J48 class
J48 j48Classifier = new J48();
New Maven Project
New Maven project
Select an Archetype
Catalog: All Catalogs
Configure...
Filter: com.browserstack
Group Id
Artifact Id
Version
com.browserstack junit4-archetype-setup 1.1
com.browserstack junit5-archetype-setup 1.1
com.browserstack selenide-archetype-setup 1.1
com.browserstack serenity-archetype-setup 1.0
com.browserstack testng-archetype-integrate 1.2
com.browserstack testng-archetype-setup 1.4
BrowserStack TestNG Archetype for Getting Started
https://repo1.maven.org/maven2
Show the last version of Archetype only
Include snapshot archetypes
Add Archetype...
Advanced
< Back
Next >
Finish
Cancel
Problems
No consoles to displ
weka.api
Helloweka
main(Strin


eclipse-workspace - weka-api/src/weka/api/Helloweka.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help
Package Explorer
BloodBankCloud
BloodBankCloudProject
HomeCatering
proj_homecatering
Sample
Servers
weka-api
weka-sample
// Create J48 classifier by
// creating object of J48 class
J48 j48Classifier = new J48();
New Maven Project
New Maven project
Specify Archetype parameters
Group Id: java-project
Artifact Id: javarepo
Version: 0.0.1-SNAPSHOT
Package: java_project.javarepo
Properties available from archetype:
Name
Value
BROWSERSTACK...
abiramirathina_4JtEPb
BROWSERSTACK...
iq5fCTKMdVimwUTPQmdP
Add...
Remove
Advanced
< Back
Next >
Finish
Cancel


eclipse-workspace - javarepo/browserstack.yml - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help
userName: abiramirathina_4JtEPb
accessKey: iq5fCTKMdVimwUTPQmdP
platforms:
- os: Windows
osVersion: 11
browserName: Chrome
browserVersion: 103.0
- os: Windows
osVersion: 10
browserName: Firefox
browserVersion: 102.0
- os: OS X
osVersion: Big Sur
browserName: Safari
browserVersion: 14.1
parallelsPerPlatform: 1
New
Open F3
Open With
Show In Alt+Shift+W
Show in Local Terminal
Copy Ctrl+C
Copy Qualified Name
Paste Ctrl+V
Delete Delete
Remove from Context Ctrl+Alt+Shift+Down
Mark as Landmark Ctrl+Alt+Shift+Up
Build Path
Refactor Alt+Shift+T
Import...
Export...
Refresh F5
Assign Working Sets...
Coverage As
Run As
Debug As
Profile As
Maven
Team
Compare With
Replace With
Source
Validate
Properties Alt+Enter
1 AWS SAM Local
2 Maven build Alt+Shift+X, M
3 Maven build...
4 Maven clean
5 Maven generate-sources
6 Maven install
7 Maven test
Run Configurations...
Download sources and javadoc: (9%)

Java code for testing

```
package com.browserstack;

import java.net.MalformedURLException;

import java.net.URL;

import java.time.Duration;

import java.util.Hashtable;

import java.util.Iterator;

import java.util.Set;

import java.util.concurrent.TimeUnit;

import org.openqa.selenium.By;

import org.openqa.selenium.JavascriptExecutor;

import org.openqa.selenium.WebDriver;

import org.openqa.selenium.WebElement;

import org.openqa.selenium.remote.DesiredCapabilities;

import org.openqa.selenium.remote.RemoteWebDriver;

import org.openqa.selenium.support.ui.ExpectedConditions;

import org.openqa.selenium.support.ui.WebDriverWait;


class TestClass1 implements Runnable {

public void run() {


Hashtable<String, String> capsHashtable = new Hashtable<String, String>();

 capsHashtable.put("browser", "chrome");

 capsHashtable.put("browser_version", "107.0");

 capsHashtable.put("os", "Windows");

 capsHashtable.put("os_version", "10");
```

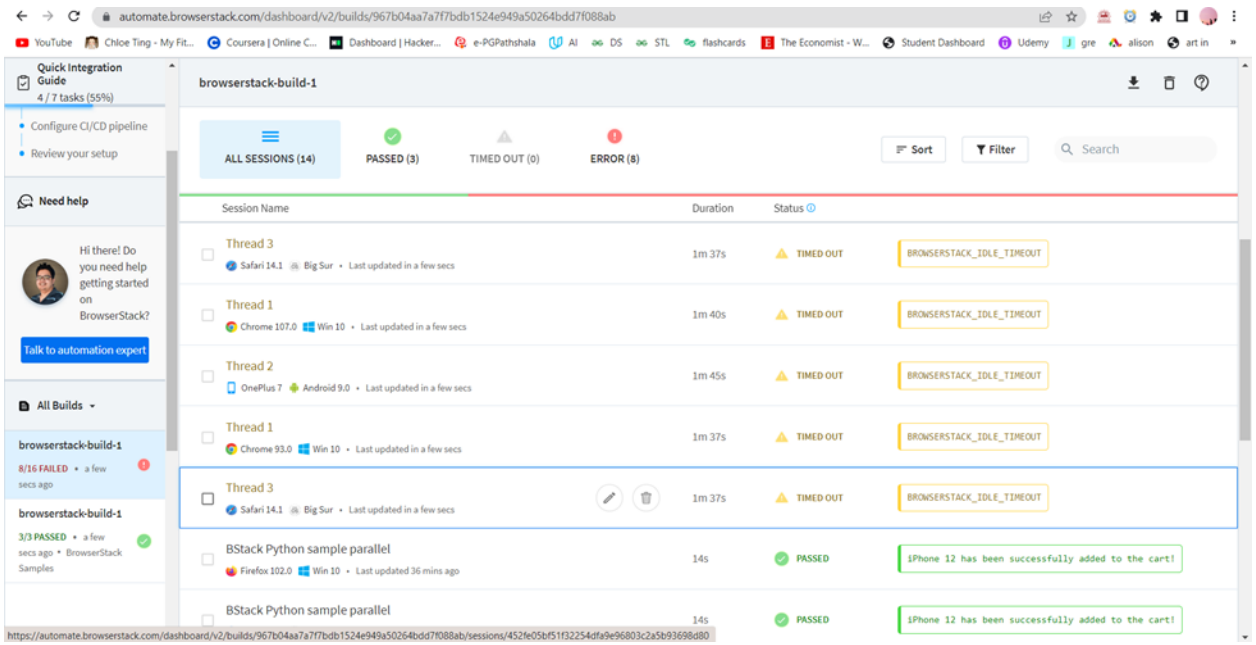
```
        capsHashtable.put("build", "browserstack-build-1");


capsHashtable.put("name", "Thread 1");
        test r1 = new test();
                r1.executeTest(capsHashtable);
  }
}
class TestClass2 implements Runnable {
public void run() {

Hashtable<String, String> capsHashtable = new Hashtable<String, String>();
 capsHashtable.put("device", "OnePlus 7");
 capsHashtable.put("os_version", "7.0");
 capsHashtable.put("browserName", "android");
 capsHashtable.put("realMobile", "true");
 capsHashtable.put("build", "browserstack-build-1");
 capsHashtable.put("name", "Thread 2");
 test r2 = new test();
        r2.executeTest(capsHashtable);
 }
}
class TestClass3 implements Runnable {
 public void run() {

Hashtable<String, String> capsHashtable = new Hashtable<String, String>();
 capsHashtable.put("browser", "safari");
```

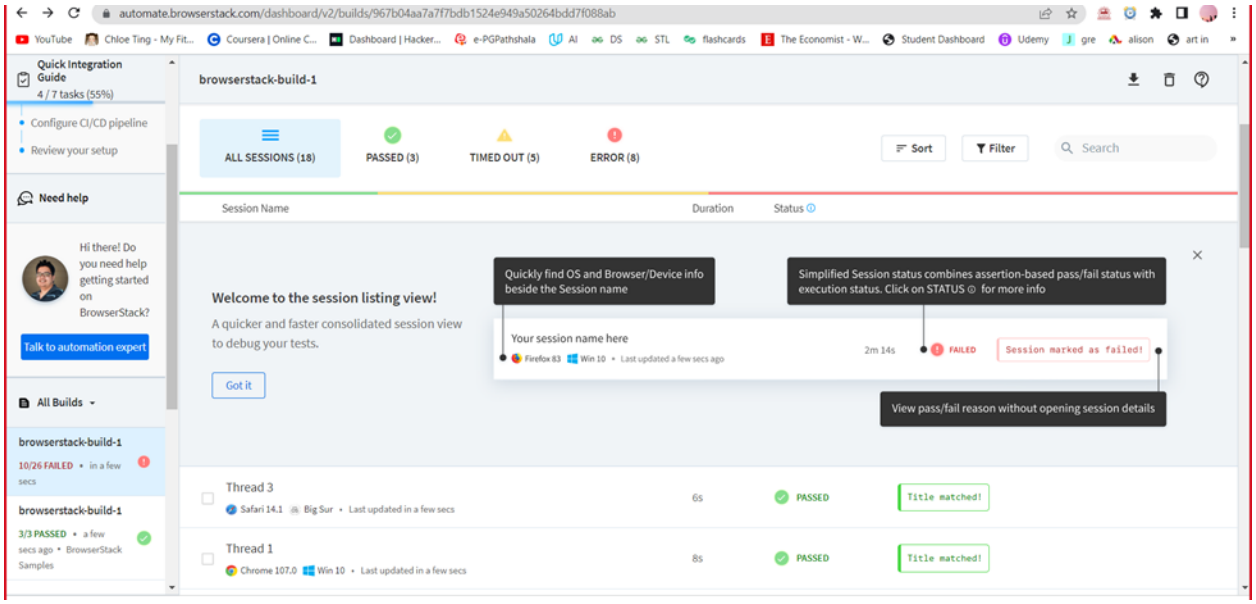
```
capsHashtable.put("browser_version", "latest");

capsHashtable.put("os", "OS X");

capsHashtable.put("os_version", "Big Sur");

capsHashtable.put("build", "browserstack-build-1");

capsHashtable.put("name", "Thread 3");

test r3 = new test();

        r3.executeTest(capsHashtable);

  }

}


public class test {

public static final String USERNAME = "abiramirathina_4JtEPb";

public static final String AUTOMATE_KEY = "iq5fCTKMdVimwUTPQmdP";

public static final String URL = "https://" + USERNAME + ":" + AUTOMATE_KEY +
"@hub-cloud.browserstack.com/wd/hub";

 public static void main(String[] args) throws Exception {

 Thread object1 = new Thread(new TestClass1());

 object1.start();

 Thread object2 = new Thread(new TestClass2());

 object2.start();

 Thread object3 = new Thread(new TestClass3());

 object3.start();

  }

 public void executeTest(Hashtable<String, String> capsHashtable) {


String key;
```

```
                DesiredCapabilities caps = new DesiredCapabilities();
 // Iterate over the hashtable and set the capabilities
                Set<String> keys = capsHashtable.keySet();
                Iterator<String> itr = keys.iterator();
                while (itr.hasNext()) {
                key = itr.next();
                caps.setCapability(key, capsHashtable.get(key));
}

        WebDriver driver;
                try {

driver = new RemoteWebDriver(new URL(URL), caps);
                        JavascriptExecutor jse = (JavascriptExecutor)driver;

driver.get("https://savbank-4a591.web.app/");

        driver.findElement(By.xpath("/html/body/div[2]/div/div[2]/div[1]/div[3]/button")).click();



// Setting the status of test as 'passed' or 'failed' based on the condition;
        WebDriverWait wait1 = new WebDriverWait(driver, Duration.ofSeconds(5));
try {
 WebDriverWait wait = new WebDriverWait(driver,Duration.ofSeconds(60)) ;
driver.findElement(By.xpath("/html/body/nav/div/div/div/div/a[3]")).click();
```

```
System.out.println("Found the button, clicked on that...");

jse.executeScript("browserstack_executor: {\"action\": \"setSessionStatus\", \"arguments\": {\"status\": \"passed\", \"reason\": \"Title matched!\"}}");

 }

        catch(Exception e) {

jse.executeScript("browserstack_executor: {\"action\": \"setSessionStatus\", \"arguments\": {\"status\":\"failed\", \"reason\": \"Title not matched\"}}");

}

System.out.println(driver.getTitle());

                driver.quit();

                } catch (MalformedURLException e) {

                e.printStackTrace();

        }

        }

}
```

Result

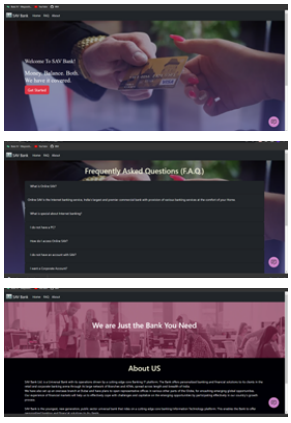


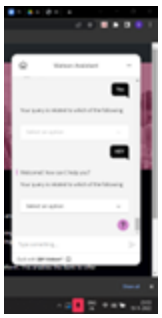
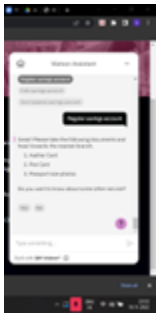
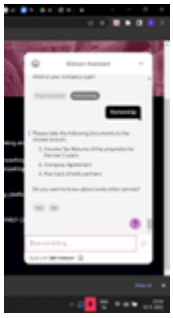
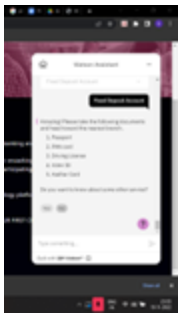
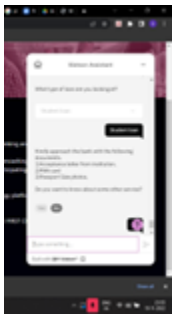


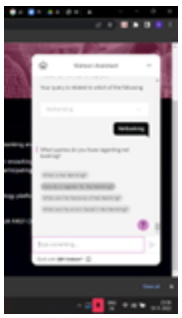
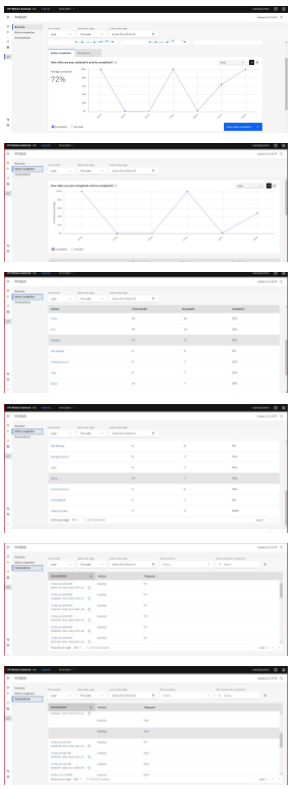
9. RESULTS

9.1 Performance Metrics

Model Performance Testing:

S.No	Parameter	Values	Screenshot
1.	Model Summary		

			
2.	Accuracy	Training Accuracy - 72 Validation Accuracy -100	
3.	Confidence Score (Only Yolo Projects)	Class Detected - Confidence Score -	N/A

10. ADVANTAGES & DISADVANTAGES

Advantages

1) 24/7 Availability
2) 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.

3) Improve Work Efficiency & Reduce Workload

4) Hassle-free Application for Other Services-Users may utilize chatbots to apply for services such as loans, new cards, and reward programs. It can provide consumers with information such as a list of documents that must be provided to complete the procedure smoothly.

5) Customer Support with just One Tap-Chatbots improve operational efficiency by streamlining customer care operations. SmartBots in banking also improves the omni-channel customer experience by reducing response times and allowing consumers to answer their questions in the quickest time possible.

Disadvantages

There can also be some technical issues when it comes to using chatbots for banking.

1) Chatbots require your customers to use the internet

2) People need to be more tech-savvy to use a chatbot than to make a simple phone call or interact with a customer service representative in person.

3) Finally, using a chatbot for your banking services may require additional measures to protect the identities of your users. This is because they may be sharing private or sensitive account information.

11. CONCLUSION

The world of banking is shifting faster than ever, with Artificial Intelligence (AI) leading the way in bringing in sea change in the banking industry. Various AI technologies have been applied in banking in fields such as core banking, operational performance, customer support and analytics. For AI, banking is no longer just physical branches, but a brand-new world of modern banks.

The introduction of new banking services by modern day banks is helping them to grow and expand. Technology is enabling increased penetration of the banking system, increased cost effectiveness and is making small value transactions possible. Effective use of technology has a multiplier effect on growth and development of banks. Hence with the introduction of artificial intelligence, more customers are attracted, and it is helping the banks to grow more.

Banks can apply AI to improve the client experience by empowering frictionless, round the clock client association - however AI in banking applications isn't simply restricted to retail banking services. The back and middle office of investment banking and all other money related supervisions are gaining by AI.

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.

The quality of chatbots will definitely improve over the next few years. They will become more "human," and will learn to interpret requests much better. As a further development, chatbots will predict human behavior more accurately and use this information for self-learning.

The need for well-protected and reliable AI solutions will become a major driving force of digital technologies development

13. APPENDIX

Source Code

INDEX.html

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN"
   "http://www.w3.org/TR/html4/strict.dtd">
<html>
<head>
    <title>Welcome To SAV</title>
    <link rel="stylesheet" href="static\main-sample.css"></link>
                                                                <link
   href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/css/bootstra
   p.min.css"                                          rel="stylesheet"
   integrity="sha384-Zenh87qX5JnK2Jl0vWa8Ck2rdkQ2Bzep5IDxbcnCeuOxjzrPF/
   et3URy9Bv1WTRi" crossorigin="anonymous">

</head>
<body>
    <nav class="navbar navbar-expand-lg navbar-light bg-dark">
        <div class="container-fluid">
            <a class="navbar-brand" href="#">
```

```
                                                                    <img
  src="https://images.pexels.com/photos/351264/pexels-photo-351264.jpe
  g?cs=srgb&dl=pexels-expect-best-351264.jpg&fm=jpg&_gl=1*1uyigic*_ga*
  ODg5MDIyMjI1LjE2Njg1MjgyNTE.*_ga_8JE65Q40S6*MTY2ODUyODI1Mi4xLjEuMTY2
  ODUyOTkyNy4wLjAuMA.."      alt="Logo"      width="30"      height="24"
  class="d-inline-block align-text-top">
              SAV Bank
          </a>
                      <button   class="navbar-toggler"   type="button"
  data-bs-toggle="collapse"        data-bs-target="#navbarNavAltMarkup"
  aria-controls="navbarNavAltMarkup"              aria-expanded="false"
  aria-label="Toggle navigation">
<!--             <span class="navbar-toggler-icon"></span> -->
        </button>
                            <div   class="collapse   navbar-collapse"
  id="navbarNavAltMarkup">
          <div class="d-flex">
              <div class="navbar-nav">
                      <a  class="nav-link  active"  aria-current="page"
  href="/">Home</a>
              <a class="nav-link" href="./faq.html">FAQ</a>
              <a class="nav-link" href="./about.html">About</a>
              </div>
          </div>
        </div>
      </nav>
      <div class="box">
        <div class="container">
            <div class="col-sm">
                <div class="text">
                    <h3>Welcome To SAV Bank!</h3>
                    <br/>
                    <div class="desc">
                                <h2>Money. Balance. Both.<br>We have it
  covered.</h2>
                    </div>
                </div>
                        <a  role="button"  class="btn  btn-danger  btn-lg"
  href="/">Get Started</a>
```

```
        </div>
    </div>
</div>

    <script   src="https://code.jquery.com/jquery-3.2.1.slim.min.js"
integrity="sha384-KJ3o2DKtIkvYIK3UENzmM7KCkRr/rE9/Qpg6aAZGJwFDMVNA/G
pGFF93hXpG5KkN" crossorigin="anonymous"></script>
                                                                <script
src="https://cdn.jsdelivr.net/npm/popper.js@1.12.9/dist/umd/popper.m
in.js"
integrity="sha384-ApNbgh9B+Y1QKtv3Rn7W3mgPxhU9K/ScQsAP7hUibX39j7fakF
PskvXusvfa0b4Q" crossorigin="anonymous"></script>
                                                                <script
src="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/js/bootstrap.
min.js"
integrity="sha384-JZR6Spejh4U02d8jOt6vLEHfe/JQGiRRSQQxSfFWpi1MquVdAy
jUar5+76PVCmYl" crossorigin="anonymous"></script>
 <script>
    window.watsonAssistantChatOptions = {
        integrationID: "dfd870d4-d6b7-49ed-a218-32422a51571e", // The
ID of this integration.
        region: "us-south", // The region your integration is hosted
in.
        serviceInstanceID: "53ae4363-354b-4dd0-ab33-6cedba91d306", //
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/vers
ions/"    +    (window.watsonAssistantChatOptions.clientVersion    ||
'latest') + "/WatsonAssistantChatEntry.js";
      document.head.appendChild(t);
    });
    </script>
</body>
```

ABOUT.html

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN"
   "http://www.w3.org/TR/html4/strict.dtd">
<html>
<head>
    <title>Welcome To SAV</title>
    <link rel="stylesheet" href="static\main-sample.css"></link>
                                                                <link
   href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/css/bootstra
   p.min.css"                                                rel="stylesheet"
   integrity="sha384-Zenh87qX5JnK2Jl0vWa8Ck2rdkQ2Bzep5IDxbcnCeuOxjzrPF/
   et3URy9Bv1WTRi" crossorigin="anonymous">
</head>
<body>
    <nav class="navbar navbar-expand-lg navbar-light bg-dark">
        <div class="container-fluid">
            <a class="navbar-brand" href="#">
                                                                <img
   src="https://images.pexels.com/photos/351264/pexels-photo-351264.jpe
   g?cs=srgb&dl=pexels-expect-best-351264.jpg&fm=jpg&_gl=1*1uyigic*_ga*
   ODg5MDIyMjI1LjE2Njg1MjgyNTE.*_ga_8JE65Q40S6*MTY2ODUyODI1Mi4xLjEuMTY2
   ODUyOTkyNy4wLjAuMA.."      alt="Logo"      width="30"      height="24"
   class="d-inline-block align-text-top">
                SAV Bank
            </a>
                        <button   class="navbar-toggler"   type="button"
   data-bs-toggle="collapse"        data-bs-target="#navbarNavAltMarkup"
   aria-controls="navbarNavAltMarkup"             aria-expanded="false"
   aria-label="Toggle navigation">
<!--             <span class="navbar-toggler-icon"></span> -->
         </button>
                            <div   class="collapse   navbar-collapse"
   id="navbarNavAltMarkup">
            <div class="d-flex">
                <div class="navbar-nav">
                        <a  class="nav-link  active"  aria-current="page"
   href="/">Home</a>
                <a class="nav-link" href="./faq.html">FAQ</a>
```

```
                <!-- <a class="nav-link" href="/customer">Customer
Care</a> -->
            <a class="nav-link" href="./about.html">About</a>
            </div>
        </div>
      </div>
    </div>
 </nav>
 <div class="section1">
    <div class="heading">
        <center><h1>We are Just the Bank You Need</h1></center>
    </div>
 </div>
 <div class="Fields">
    <h1>About US</h1>
    <div class="container">
     <p>SAV Bank Ltd. is a Universal Bank with its operations driven
by a cutting edge core
          Banking IT platform. The Bank offers personalized banking
and financial solutions to
           its clients in the retail and corporate banking arena
through its large network of
           Branches and ATMs, spread across length and breadth of
India.
        <br>We have also set up
             an overseas branch at Dubai and have plans to open
representative offices in various
          other parts of the Globe, for encashing emerging global
opportunities.
          <br>Our experience of financial markets will help us to
effectively cope with challenges
               and capitalize on the emerging opportunities by
participating effectively in our
        country's growth process.
          <br><br>SAV Bank is the youngest, new generation, public
sector universal bank
           that rides on a cutting edge core banking Information
Technology platform.
          This enables the Bank to offer personalized banking and
financial solutions to
```

```
          its clients.
               <br><br>Our vision for the Bank is "TO BE THE MOST
PREFERRED AND
           TRUSTED BANK ENHANCING VALUE FOR ALL STAKEHOLDERS AND YOUR
FIRST
          CHOICE FOR MONETARY NEEDS".</p>
      </div>
  </div>
      <script  src="https://code.jquery.com/jquery-3.2.1.slim.min.js"
integrity="sha384-KJ3o2DKtIkvYIK3UENzmM7KCkRr/rE9/Qpg6aAZGJwFDMVNA/G
pGFF93hXpG5KkN" crossorigin="anonymous"></script>
                                                                  <script
src="https://cdn.jsdelivr.net/npm/popper.js@1.12.9/dist/umd/popper.m
in.js"
integrity="sha384-ApNbgh9B+Y1QKtv3Rn7W3mgPxhU9K/ScQsAP7hUibX39j7fakF
PskvXusvfa0b4Q" crossorigin="anonymous"></script>
                                                                  <script
src="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/js/bootstrap.
min.js"
integrity="sha384-JZR6Spejh4U02d8jOt6vLEHfe/JQGiRRSQQxSfFWpi1MquVdAy
jUar5+76PVCmYl" crossorigin="anonymous"></script>
  <script>
      window.watsonAssistantChatOptions = {
        integrationID: "dfd870d4-d6b7-49ed-a218-32422a51571e", // The
ID of this integration.
         region: "us-south", // The region your integration is hosted
in.
        serviceInstanceID: "53ae4363-354b-4dd0-ab33-6cedba91d306", //
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/vers
ions/"    +    (window.watsonAssistantChatOptions.clientVersion    ||
'latest') + "/WatsonAssistantChatEntry.js";
        document.head.appendChild(t);
      });
    </script>
```

```
</body>
</html>
```

FAQ.html

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN"
   "http://www.w3.org/TR/html4/strict.dtd">
<html>
<head>
    <title>Welcome To SAV</title>
    <link rel="stylesheet" href="static\main-sample.css"></link>
                                                                <link
   href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/css/bootstra
   p.min.css"                                              rel="stylesheet"
   integrity="sha384-Zenh87qX5JnK2Jl0vWa8Ck2rdkQ2Bzep5IDxbcnCeuOxjzrPF/
   et3URy9Bv1WTRi" crossorigin="anonymous">

</head>
<body>
    <nav class="navbar navbar-expand-lg navbar-light bg-dark">
        <div class="container-fluid">
            <a class="navbar-brand" href="#">
                                                                <img
   src="https://images.pexels.com/photos/351264/pexels-photo-351264.jpe
   g?cs=srgb&dl=pexels-expect-best-351264.jpg&fm=jpg&_gl=1*1uyigic*_ga*
   ODg5MDIyMjI1LjE2Njg1MjgyNTE.*_ga_8JE65Q40S6*MTY2ODUyODI1Mi4xLjEuMTY2
   ODUyOTkyNy4wLjAuMA.."      alt="Logo"      width="30"      height="24"
   class="d-inline-block align-text-top">
                SAV Bank
            </a>
                        <button   class="navbar-toggler"   type="button"
   data-bs-toggle="collapse"        data-bs-target="#navbarNavAltMarkup"
   aria-controls="navbarNavAltMarkup"              aria-expanded="false"
   aria-label="Toggle navigation">
<!--              <span class="navbar-toggler-icon"></span> -->
          </button>
                              <div   class="collapse   navbar-collapse"
   id="navbarNavAltMarkup">
            <div class="d-flex">
```

```
            <div class="navbar-nav">
                    <a class="nav-link active" aria-current="page"
href="/">Home</a>
            <a class="nav-link" href="./faq.html">FAQ</a>
                <!-- <a class="nav-link" href="/customer">Customer
Care</a> -->
            <a class="nav-link" href="./about.html">About</a>
            </div>
          </div>
        </div>
      </div>
  </nav>
  <div class="box">
      <div class="container">
                  <h1  class="display"  style="margin-bottom:  30px;
margin-top:30px;color: beige;">
            <center>Frequently Asked Questions (F.A.Q.)</center>
          </h1>
          <div class="faq">
              <div id="accordion">
                  <div class="card bg-dark">
                    <div class="card-header" id="headingOne">
                      <h5 class="mb-0">
                                        <button class="btn collapsed"
data-toggle="collapse"                    data-target="#collapseOne"
aria-expanded="true" aria-controls="collapseOne">
                              <p>What is Online SAV?</p>
                        </button>
                      </h5>
                    </div>

                        <div id="collapseOne" class="collapse show"
aria-labelledby="headingOne" data-parent="#accordion">
                      <div class="card-body">
                                <p>Online SAV is the Internet banking
service, India's largest and premier commercial bank with provision
of various banking services at the comfort of your Home.</p>
                      </div>
                    </div>
                  </div>
```

```
                <div class="card bg-dark">
                  <div class="card-header" id="headingTwo">
                    <h5 class="mb-0">
                                        <button class="btn collapsed"
data-toggle="collapse"                    data-target="#collapseTwo"
aria-expanded="false" aria-controls="collapseTwo">
                                    <p>What is special about Internet
banking?</p>
                      </button>
                    </h5>
                  </div>
                            <div id="collapseTwo" class="collapse"
aria-labelledby="headingTwo" data-parent="#accordion">
                    <div class="card-body">
                         <p>Internet banking is the most convenient
way to bank- anytime, any place, at your convenience.</p>
                    </div>
                  </div>
                </div>
                <div class="card bg-dark">
                  <div class="card-header" id="headingThree">
                    <h5 class="mb-0">
                                        <button class="btn collapsed"
data-toggle="collapse"                    data-target="#collapseThree"
aria-expanded="false" aria-controls="collapseThree">
                        <p>I do not have a PC?</p>
                      </button>
                    </h5>
                  </div>
                          <div id="collapseThree" class="collapse"
aria-labelledby="headingThree" data-parent="#accordion">
                    <div class="card-body">
                     <p>You can access Online SAV from any computer
that has connectivity to the Internet. But make sure your computer
is Malware free.</p>
                    </div>
                  </div>
                </div>
                <div class="card bg-dark">
                    <div class="card-header" id="headingThree">
```

```
                        <h5 class="mb-0">
                                    <button class="btn collapsed"
data-toggle="collapse"                    data-target="#collapseFour"
aria-expanded="false" aria-controls="collapseThree">
                                <p>How do I access Online SAV?</p>
                            </button>
                        </h5>
                    </div>
                                <div id="collapseFour" class="collapse"
aria-labelledby="headingThree" data-parent="#accordion">
                        <div class="card-body">
                            <p>You need to have an account at a branch.
You also need to register for the Internet banking service with the
branch. Branch will provide you a Pre Printed Kit (PPK) containing
username and password for first login. If you are not in a position
to collect PPK in person, the bank will arrange to send a username
through SMS and a mailer containing password to your registered
address. Log in to our website using this username and password. At
the first login, you will need to go through a simple initialization
process. Our Net banking assistant will guide you step by step
through this process on the site.</p>
                        </div>
                    </div>
                </div>
                <div class="card bg-dark">
                    <div class="card-header" id="headingThree">
                        <h5 class="mb-0">
                                    <button class="btn collapsed"
data-toggle="collapse"                    data-target="#collapseFive"
aria-expanded="false" aria-controls="collapseFive">
                                        <p>I do not have an account with
SAV?</p>
                            </button>
                        </h5>
                    </div>
                                <div id="collapseFive" class="collapse"
aria-labelledby="headingThree" data-parent="#accordion">
                        <div class="card-body">
                                <p>You are welcome to open it now. It is
very easy to open an account with SBI. You can apply online for
```

```
opening of a savings bank account. A link 'Online SB Account
Application' is available on the home page of our website or just
walk in to any of our branches nearby. Our staff would be pleased to
assist you.</p>
                    </div>
                  </div>
                </div>
                <div class="card bg-dark">
                  <div class="card-header" id="headingThree">
                    <h5 class="mb-0">
                                    <button class="btn collapsed"
data-toggle="collapse"                    data-target="#collapseSix"
aria-expanded="false" aria-controls="collapseThree">
                          <p>I want a Corporate Account?</p>
                      </button>
                    </h5>
                  </div>
                        <div id="collapseSix" class="collapse"
aria-labelledby="headingThree" data-parent="#accordion">
                    <div class="card-body">
                            <p>We are sorry that this service is
underdevelopment.</p>
                    </div>
                  </div>
                </div>
              </div>
          </div>
      </div>
  </div>
      <script  src="https://code.jquery.com/jquery-3.2.1.slim.min.js"
integrity="sha384-KJ3o2DKtIkvYIK3UENzmM7KCkRr/rE9/Qpg6aAZGJwFDMVNA/G
pGFF93hXpG5KkN" crossorigin="anonymous"></script>
                                                                <script
src="https://cdn.jsdelivr.net/npm/popper.js@1.12.9/dist/umd/popper.m
in.js"
integrity="sha384-ApNbgh9B+Y1QKtv3Rn7W3mgPxhU9K/ScQsAP7hUibX39j7fakF
PskvXusvfa0b4Q" crossorigin="anonymous"></script>
                                                                <script
src="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/js/bootstrap.
min.js"
```

```
   integrity="sha384-JZR6Spejh4U02d8jOt6vLEHfe/JQGiRRSQQxSfFWpi1MquVdAy
   jUar5+76PVCmYl" crossorigin="anonymous"></script>
    <script>
        window.watsonAssistantChatOptions = {
          integrationID: "dfd870d4-d6b7-49ed-a218-32422a51571e", // The
   ID of this integration.
           region: "us-south", // The region your integration is hosted
   in.
          serviceInstanceID: "53ae4363-354b-4dd0-ab33-6cedba91d306", //
   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/vers
   ions/"    +    (window.watsonAssistantChatOptions.clientVersion    ||
   'latest') + "/WatsonAssistantChatEntry.js";
          document.head.appendChild(t);
        });
      </script>
</body>
</html>
```

APP.py

```
from flask import Flask, render_template
app = Flask(__name__)


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


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

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


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

GitHub & Project Demo Link

Github:

https://github.com/IBM-EPBL/IBM-Project-8772-1658929222

Project Demo Link:

Website:

https://savbank-4a591.web.app

Video:

https://drive.google.com/file/d/14bL8dnx4jyfzFyYLRRiRIkB2-YlkNy7P/view?usp=share_link