M.I.E.T EGINEERING COLLEGE

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TRICHY-620007.

PROJECT

AI BASED DISCOURSE FOR BANKING INDUSTRY

DONE BY

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1. INTRODUCTION

1.1 Project Overview

The Internet Banking Industry has seen tremendous growth in recent years mainly due to the massive advancement in technology. The thing with the internet is that everyone connected to it can access almost anything around the world. The involvement of the internet in the banking sector has made it more viable and user friendly than ever before. Customers of any bank could access their account details and the transactions across the world with ease and can work with ease around any branches. So, an enhanced and smarter way of interaction with the customers has to be built to ensure efficient delivery of service. In order to overcome the user satisfaction issues associated with banking services, a chatbot will provide personal and efficient communication between the user and the bank. It is built to be the overall virtual assistant that can facilitate customers to ask banking- related questions without visiting the bank or calling up customer service centres as well as providing them with relevant suggestions.

1.2 Purpose

The main purpose of the chatbot is to provide the customers with all the information possible regarding any banking queries. It is built to be the overall virtual assistant that can facilitate customers to ask banking- related questions without visiting the bank or calling up customer service centres as well as providing them with relevant suggestions. Hence it essentially tries to eliminate the purpose of visiting a banking for basic queries and procedures.

2. LITERATURE SURVEY

2.1 Existing problem

Project Title	Algorithms used	Advantages	Disadvantages

Impact Of Online Banking Services: A Study.	Usage of Technology Acceptance Model (TAM)	A basic overview of how the system of Online banking works	Lacks the detailed explanation of the networks and clients involved.
Impact of E-Banking on Traditional Banking Services. International Journal of Computer Science and Communication Networks	Usage of B2C Disbursement On Net, Client Service on the queries, Account Management	It recommends suitable banking option for every option the user selects	No working model or a framework has been provided
An Evaluative Study on Internet Banking Security among Selected Indian Bank Customer	Analyses the customers' perceptions and awareness towards Internet banking security. Knows impact of the internet banking securities among the selected customers in Coimbatore	Gives a metric on how the services, security and the benefits that are being used in the online banking	Has no involvement of Artificial Intelligence
The Influence of Artificial Intelligence on the Banking Industry & How AI is Changing the Face of Modern Day Banks	Provides an extremely detailed overview of how the machine learning can do in helping banking customers	Findings of the influence of the AI algorithms on the fraud detection and its prevention	No particular algorithm was actually emphasized in the entire study
How Artificial Intelligence is changing the banking sector	Studies the areas where the artificial intelligence is being used by the banks. Studies about the applications of AI in use in the leading commercial banks in India: State Bank of India, HDFC, ICICI and Axis	Provision of Smart Wallets, Underwriting, Voice Assisted Banking and Smart Lending Decisions	Individual Banking solutions for every sector has been given generally for which the queries and responses can differ extensively
Utilization of artificial intelligence in finance	Studies about the application of Artificial intelligence in Banking Sector Understands the problems faced by customers while using internet banking services	Anomaly detection through pattern recognition Market Analysis through data mining	No specific usage of chatbot in the cloud or the usage of any helping service that would serve the banking customers

2.2 References

[1]. Nedumaran, Dr & Kaleeswaran, Baladevi. (2017). Impact Of Online Banking Services: A Study.

[2]. Vyas, Shilpan. (2012). Impact of E-Banking on Traditional Banking Services. International Journal of Computer Science and Communication Networks

[3]. V. Vimala (2015). An Evaluative Study on Internet Banking Security among Selected Indian Bank Customer

[4]. Kaur, Navleen & Sahdev, Supriya & Sharma, Dr. (2020). Banking 4.0: -The Influence of Artificial Intelligence on the Banking Industry & How AI is Changing the Face of Modern Day Banks‖. International Journal Of Management. 11. 577-585. 10.34218/IJM.11.6.2020.049.

[5]. Christian Catalini, Chris Foster and Ramana Nanda (2018), 'Machine Intelligence vs. Human Judgment in New Venture Finance'

[6]. Jewandah S (2018) "How Artificial Intelligence is changing the banking sector"

[7]. Andrew Ng (2016), "What artificial intelligence can do and can't do right now"

[8]. Chan Kok Thim and Eric Seah (2011) , "Optimizing portfolio construction using artificial intelligence"

[9]. Ryoji Kashiwagi (2005), "Utilization of artificial intelligence in finance"

[10]. Vidhya Jolly (2016). The Influence of Internet Banking on the efficiency and cost savings for banks' customers

[11]. Richard Selassie Bebli. The Impact of internet banking service quality on customer satisfaction in the banking sector of Ghana

[12]. Asue EselemValence, Measuring The Impact Of Electronic Banking On Commercial Banking Performance. A Case Study On Uba Bank Cameroon

[13]. Prof. Edwin Agwu, The role of e-banking on operational efficiency of banks in Nigeria

2.3 Problem Statement Definition

In order to guide the customers throughout all the financial services provided by the bank, an intelligent system has to be introduced to provide people with the best solution possible. The users are bank customers who need a service, available 24/7, to clear all their queries and guide them through the various banking processes. So, an enhanced and smarter way of interaction with the customers has to be built to ensure efficient delivery of service. In order to overcome the user satisfaction issues associated with banking services, a chatbot will provide personal and efficient

communication between the user and the bank. It is built to be the overall virtual assistant that can facilitate customers to ask banking- related questions without visiting the bank or calling up customer service centres as well as providing them with relevant suggestions.

3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas
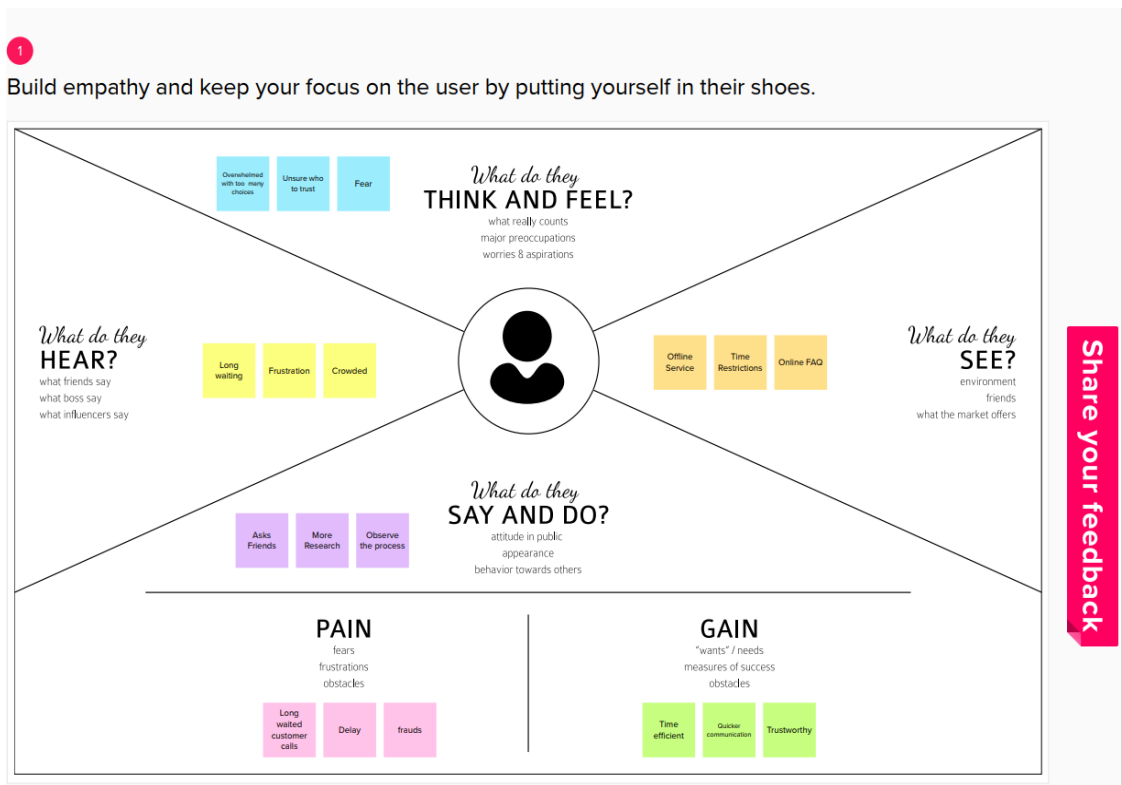
3.2 Ideation & Brainstorming

Ideas laid out by each Team Member

- AHAMED SALMAN A

• Idea 1: Keep the conversation simple and easily understandable by Customers.

• Idea 2: Decrease the response time to the user.

• Idea 3: Build pre-requisite questions for queries regarding some type of loan.

• Idea 4: Make sure every nook and corner is covered.

- BALAJI J

• Idea 1: Make sure it is available 24/7

• Idea 2: The queries should be answered with clear explanation.

• Idea 3: Make sure that account creation task doesn't glitch.

• Idea 4: Collect only the required details from the customer.

- MOHAMED THANVIR A

• Idea 1: Make sure the Bank is notified about the actions.

• Idea 2: Build pre-requisite for Bank account creation to eliminate ineligible accounts.

• Idea 3: Every query that the user can think of should be covered.

• Idea 4: The process of creating an account should be simple.

- ARAVINTH KUMAR A

• Idea 1: Simplify the process of creating an account

• Idea 2: Make sure the explanation is clear.

• Idea 3: Make sure to cover every query that the user can think of.

• Idea 4: Keep the conversation easily understandable by Customers.

- BALAJI J

• Idea 1: Make it user friendly by building the chatbot in different languages.

• Idea 2: Make sure the user is able to navigate around with ease.

• Idea 3: Every query should be answered with apt explanation.

• Idea 4: Make sure every nook and corner is covered.

Shortlisted Ideas

- Idea 1: Make it user friendly by building the chatbot in different languages.

- Idea 2: Collect only the required details from the customer.

- Idea 3: Build pre-requisite questions for queries regarding some type of loan.
-

3.3 Proposed Solution

S.No	Parameter	Description
1.	Problem Statement (Problem to be solved)	Show that your proposed solution is more cost effective, easier to implement, etc. than other proposed solutions
2.	Idea / Solution description	In order to guide the customers throughout all the financial services provided by the bank, an intelligent system has to be introduced to provide people with the best solution possible.
3.	Novelty / Uniqueness	Chatbots developed using AI should be able to answer any general banking queries on account creation, loan, net banking, other services etc. It addresses the queries of customers immediately and effectively in a cost efficient manner.
4.	Social Impact / Customer Satisfaction	In order to attain the user satisfaction issues associated with banking services, chatbot will provide personal and efficient communication between the user and the bank. It is built to be the overall virtual assistant that can facilitate customers to ask banking- related questions without visiting the bank or calling up customer service centers as well as providing them with relevant suggestions.
5.	Business Model (Revenue Model)	Employing a chatbot will be a cost-effective solution to clear customer queries for banks. It eliminates the need for a massive customer care workforce and even reduces the workload of the bank employees whose efforts can be used elsewhere.

6.	Scalability of the Solution	AI Chatbots provides 24/7 service to clear all customer queries and guide them through all the banking processes. It supports voice assistance feature and maintains a confidential conversation with customers. It can be scaled as per the requirements of the bank to include answers to queries related to any new feature or service introduced by the bank.

3.3 Problem Solution fit
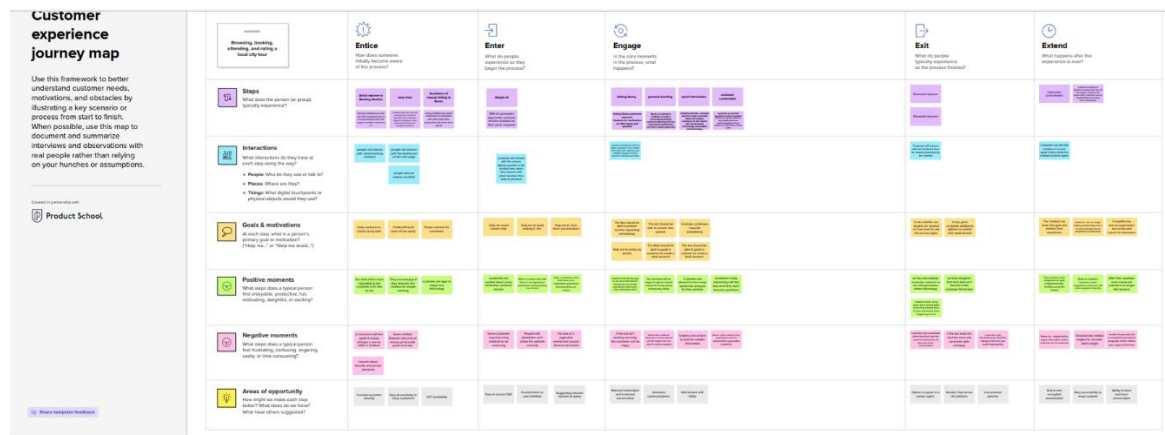
4. REQUIREMENT ANALYSIS

4.1 Functional requirement

The following are the functional requirements of the proposed solution.

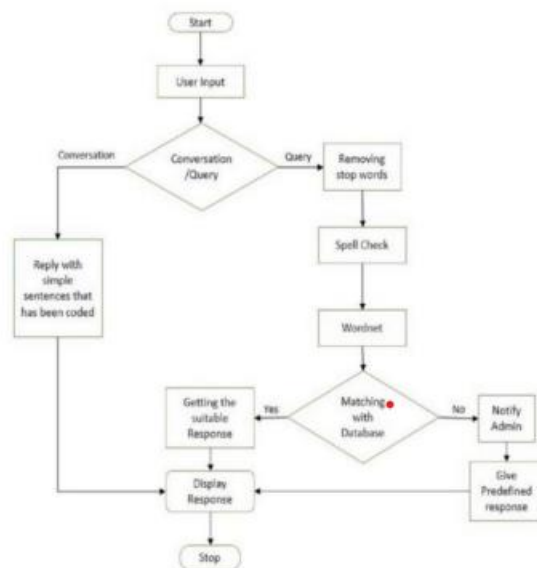| FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through Linked IN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User login	Login with Email ID and password
FR-4	Dashboard	To view user queries and give related solution
FR-5	Chatbot	Add the problem information
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

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

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Usability-Banking chatbots have all the data to predict the spending habits of the customers and help them keep their finances on track.
NFR-2	Security	Security-A banking chatbot is an AI-powered chatbot that integrates securely with banking systems and access customers' data to facilitate.
NFR-3	Reliability	Tracks the status of the queries.

| NFR-4	Performance	The online banking system is a multi- user system, which implies distinctive clients can access the system simultaneously and the system will work accurately and proficiently.
NFR-5	Availability	This ensures that all of its User and agent related data is available to the end-users at any time of the day, whenever and wherever required.
NFR-6	Scalability	In financial markets, scalability describes an institution's ability to handle increased market demands; in the corporate world, a scalable company is one that can maintain or improve its profit margins while sales volume increases.

5. PROJECT DESIGN

5.1 Data Flow Diagrams

5.2 Solution & Technical Architecture

Solution Architecture Diagram:
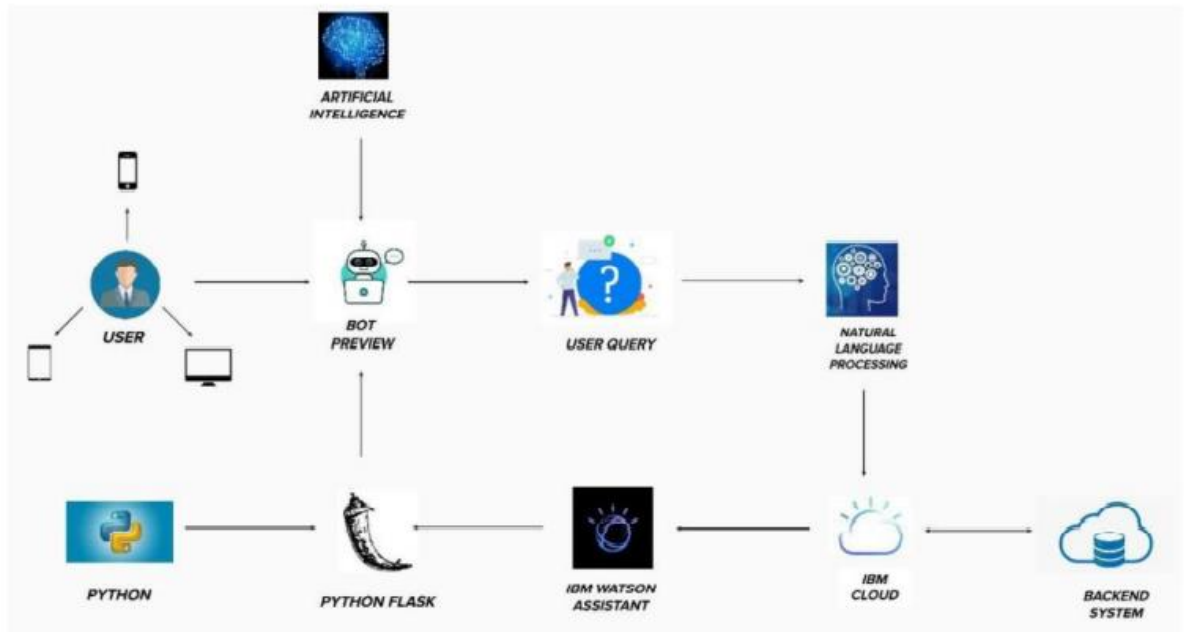
User Stories:

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application byentering my email, password, and confirmingmy password.	I can access my account /dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation emailonce I have registered for the application	I can receive confirmationemail & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the applicationthrough Facebook	I can register & access thedashboard with Facebook Login	Low	Sprint-1
		USN-4	As a user, I can register for the applicationthrough Gmail	I can access my account/ dashboard.	Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by asking my queries	I can receive related solutions.	High	Sprint-1
	Dashboard	US	As a user, I can view the new and latest bank related details	I can receive the latest bank related details	High	Sprint-2
Customer (Webuser)	Web search	US	As a user, can search all bank related queries	Happy as the customer finding numerous option	High	Sprint-2

6. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

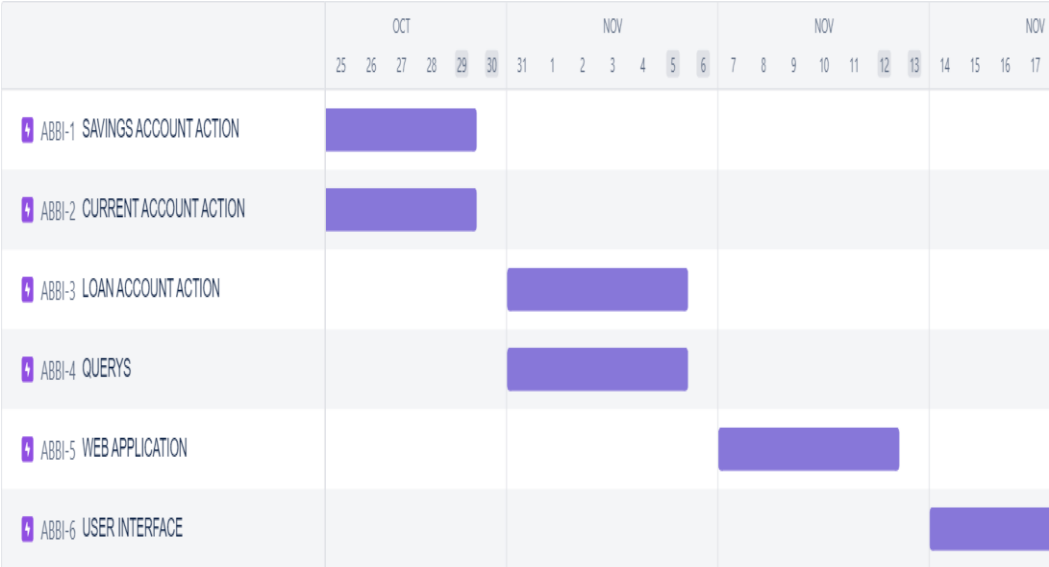| Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Savings Account Related Actions	USN-1	As a user, in the Savings Account option, I can select Types of Savings Account to get details regarding documents required for creating that savings account.	4	High	Balaji J

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1		USN-2	As a user, I can check the Interest Rates of Savings Account	4	High	Balaji J
Sprint-1		USN-3	As a user, I can check the Minimum Balance of Savings Account	3	Medium	Balaji J
Sprint-1	Current Account Related Actions	USN-4	As a user, I can choose the Type of Company to know the information on documents to be submitted for creating current account	5	High	Mohamed Thanvir M
Sprint-1		USN-5	As a user, I want to get details on procedure to close my Current Account	4	High	Ahamed Salman A
Sprint-2	Loan Account Related Actions	USN-6	As a user, I can choose the Type of Loans to know the information on choosing an essential loan scheme	3	High	Aravinth Kumar K
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-2		USN-7	As a user, I can check the Loan Amounts that can be offered for corresponding Loan Accounts chosen	3	High	Ahamed Salman A
Sprint-2		USN-8	As a user, I can check the Status of Loan for my Loan Accounts	1	Low	Ahamed Salman A
Sprint-2	General Queries Related Actions	USN-9	As a user, I want to get the procedure details for Currency Conversion facility of my bank account	2	Medium	Aravinth Kumar K
Sprint-2		USN-10	As a user, I want to check my CIBIL score for my loan application and to ensure whether my loan application is approved by the bank.	1	Low	Balaji J
Sprint-2		USN-11	As a user, I want to get the procedure details for maintaining Storage Locker facility of my bank account	3	High	Balaji J
Sprint-2	Net Banking Related Actions	USN-12	As a user, I want to get the procedure details for changing the Net Banking password of my bank account	3	High	Balaji J

Sprint		USN	User Story	Story Points	Priority	Team Members
Sprint-2		USN-13	As a user, I can select types of fund transfers to get details regarding different services available in net banking	2	Medium	Aravinth Kumar K
Sprint-2		USN-14	As a user, I want to get the procedure details for adding beneficiaries to my net banking account.	2	Medium	Aravinth Kumar k
Sprint-3	Web Application	USN-15	As a user, I want to access the chatbot in a web browser that can be accessed from almost all devices.	20	High	Balaji J, Ahamed Salman A
Sprint-4	User Interface and Web Pages	USN-16	As a user, I want to view pages of the banking website and have access to the chatbot easily.	20	High	Aravinth Kumar K, Mohamed Thanvir A

6.2 Sprint Delivery Schedule

| Phase	Phase Description	Week	Dates	Activity	Students Responsibility
5	Project planning phase (Sprint Schedules)	Week-9	17-22 Oct 2022	Sprint Delivery Plan	Submit the Delivery Schedule as per the standard template in github

6.3 Reports from JIRA

	OCT						NOV							NOV						NOV			
	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ABBI-1 SAVINGS ACCOUNT ACTION	███																							
ABBI-2 CURRENT ACCOUNT ACTION	███																							
ABBI-3 LOAN ACCOUNT ACTION							███																	
ABBI-4 QUERYS							███																	
ABBI-5 WEB APPLICATION														███										
ABBI-6 USER INTERFACE																					███			

7. INTRODUCTION FOR CHAT BOT:
   7.1)FEATURES
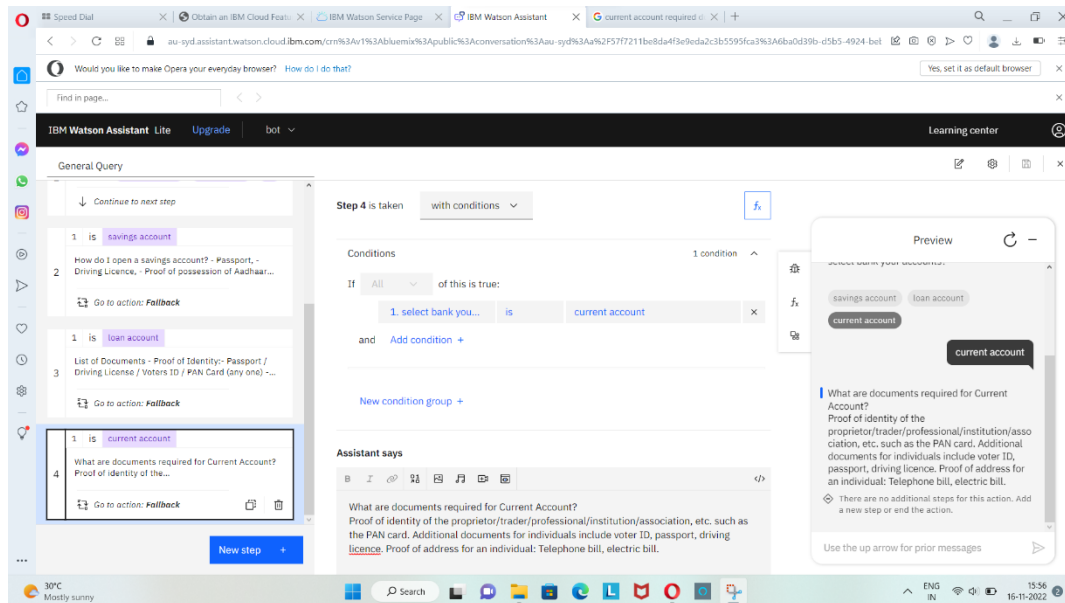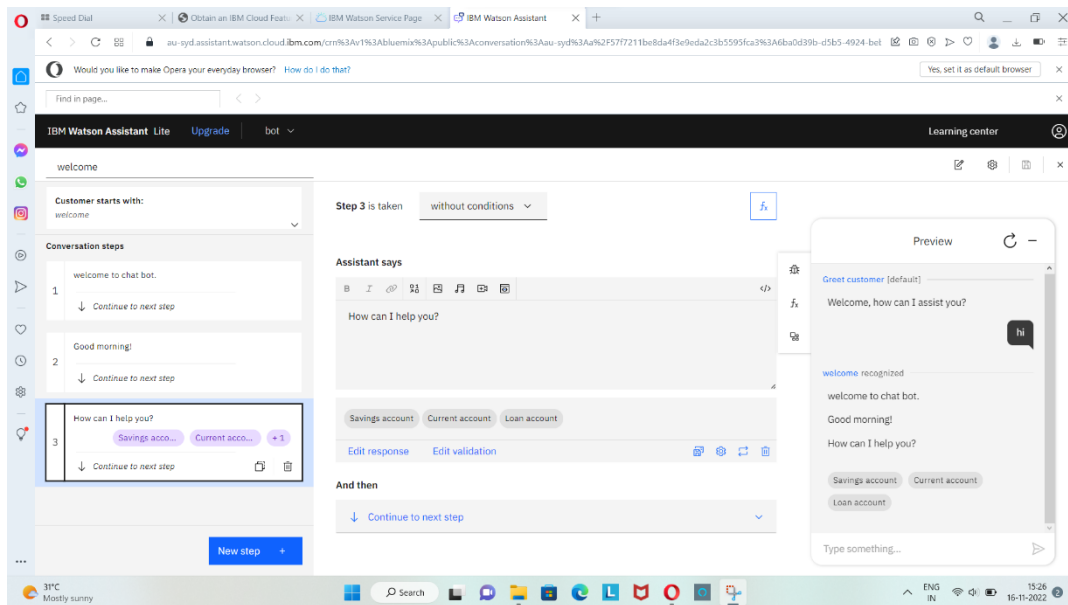
LOAN ACCOUNT REQUIRMENTS:
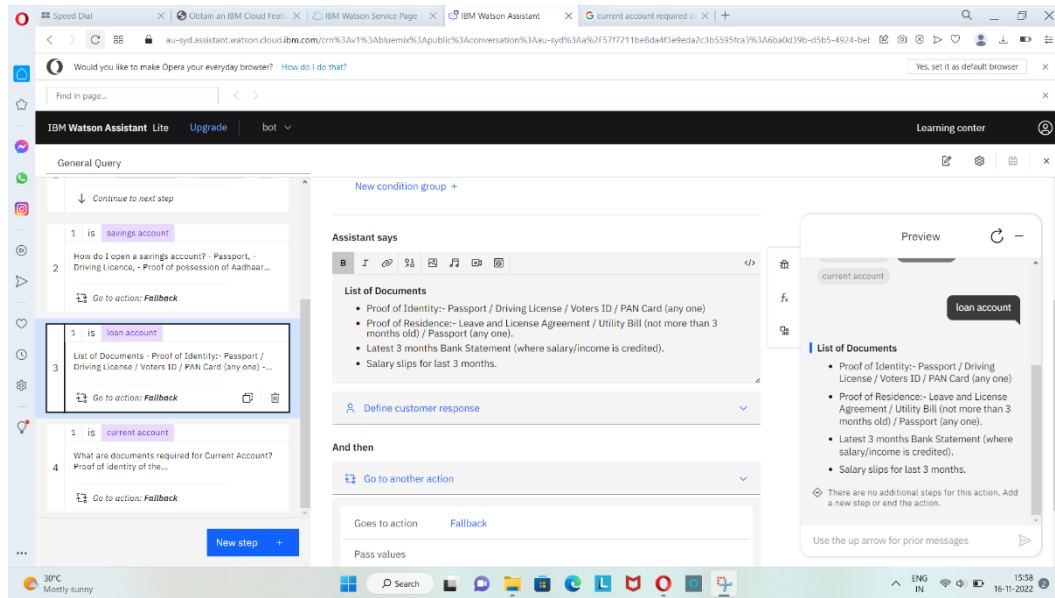
CREATING SAVING ACCOUNT:
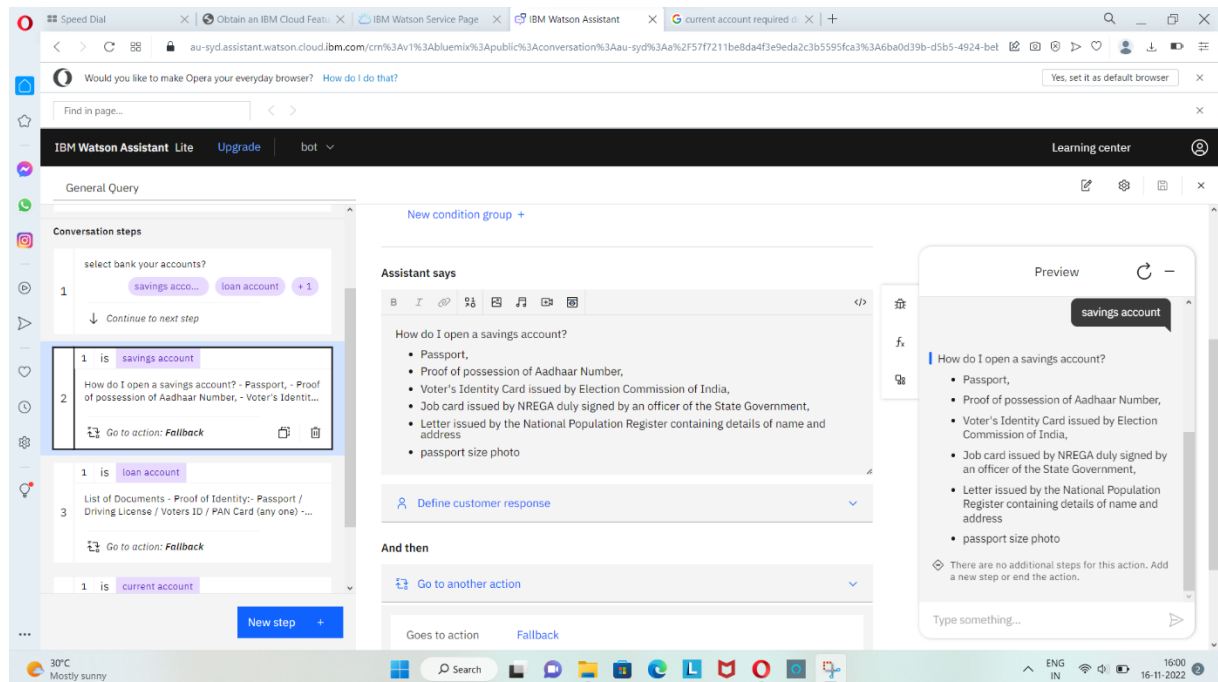
7.2) FEATURES FOR LOANS:

Providing the information about the credentials to be submitted:

1) For Home Loan

2) EDUCATION LOAN

3)PERSONAL LOAN

8. TESTING

8.1 Test Cases

S.No	Test Cases	Passed/ Failed
1.	Providing List of Queries	Passed
2.	Creating a Bank Account	Passed
3.	Prerequisites for Services	Passed
4.	Loan Offers	Passed
5.	Timings and Venue	Passed
6.	Troubleshooting Help	Passed
7.	Login/ Logout	Passed

8.2 User Acceptance Testing

S.No	Test Cases	Yes/ No
1.	Keyword driven	Yes
2.	Responds in manually drafted rules	Yes
3.	Manages multiple users	Yes
4.	Conversational Paradigm	Yes
3.	Learns from real interactions	No

4.	Training via historical data	No
5.	Has decision-making skills	No

9. RESULTS

9.1 Performance Metrics

10. ADVANTAGES

- Available 24/7 across the globe
- Direct connection with the bank agents
- No queueing in responses
- Latest queries are answered with ease
- Updated to the latest details
- Easy to setup and communicate

DISADVANTAGES

- Limited Response Scaling
- Frequent Maintenance
- Misreading of Queries
- Connectivity Issues

11. CONCLUSION

The solution to almost all the querying applications has become chatbot for assistance and resolving. We believe that the same technology can be in banking queries as it was meant for that purpose. Though the bot would not be able to solve or satisfy all the queries for customer, it can certainly resolve issues that the user might be facing often and help the banking sectors maintain great relationships with their customers.

12. FUTURE SCOPE

The future of project lies entirely on how the customers get benefitted from the interaction and the interface. We would have to make improvements in the bot to make it as user-friendly as possible. The following areas could have a serious impact on our scope:

        i.   Support for multiple languages

       ii.   Low latency in fetching responses

iii.   Voice and video instructions 13. APPENDIX Source Code :

```html
<script>
  window. Watson Assistant Chat Options = {
    integration ID: "d6a40e40-7db4-4068-b664-fad905ba936a", // The ID of this integration.
    region: "au-syd", // The region your integration is hosted in.
    service Instance ID: "6ba0d39b-d5b5-4924-beb3-8737522e070c", // The ID of your service
instance.
    on Load: function(instance) { instance. render(); }
  };
  set  Time out(function(){
    cons t=document. Create   Element('script');
    t.src="https://web-chat.global.assistant.watson.appdomain.cloud/versions/" + (window.
Watson Assistant Chat Options. Client Version || 'latest') + "/WatsonAssistantChatEntry.js";
    document. head. App end  Child(t);
  });
</script>
```

GitHub : https://github.com/IBM-EPBL/IBM-Project-35127-1660281772

Projectdemolink:
https://drive.google.com/file/d/1QGOXvsO3ZgQ_8hqt9sHwOKK9HB5WqhUo/view?usp=drivesdk