# AI BASED DISCOURSE FOR BANKING INDUSTRY

## PROJECT BASED LEARNING (NALAIYA THIRAN) ON

**PROFESSIONAL READINESS FOR INNOVATION, EMPLOYABILITY AND ENTREPRENEURSHIP**

## Submitted by

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## ABSTRACT:

Customers are less satisfied with the prompt services provided by the banks. They also feel that guidance to use the bank’s products and services is not adequately explained. When they ask for information or report any issues, the process is not easy. On the other hand, handling millions of customers with limited bank employees is a tedious process. The bank employees are also exhausted to answer to the same repetitive questions for a long time. The customers are comfortable with the answers, and the bank employees are also tired of the same routine of giving the same answers to different customers. This unpleasant situation will weaken the relationship between the banks and the customers. This paper will discuss how AI-induced chatbots improve customer interaction and how chatbots play an essential role in customer relationship management in the banking industry. The AIinduced chatbot certainly enhances the customer relationship with the banks In the existing solution the chatbots produce a response delay which is the major challenge for the banking industry to serve the needs of the customers on time. While a delayed (as opposed to instant) response time positively influences novice users’ social presence perceptions, the effect is negative for experienced users. Further, we find that social presence mediates the effect of chatbot response time on usage intentions, and that this mediation is moderated by prior chatbot experience such that the indirect effect of a delayed response time on usage intentions is positive for novice users and negative for experienced users**.**

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## INTRODUCTION

# CHAPTER 1

In the existing solution the chatbots produce a response delay which is the major challenge for the banking industry to serve the needs of the customers on time.While a delayed (as opposed to instant) response time positively influences novice users’ social presence perceptions, the effect is negative for experienced users. Further, we find that social presence mediates the effect of chatbot response time on usage intentions, and that this mediation is moderated by prior chatbot experience such that the indirect effect of a delayed response time on usage intentions is positive for novice users and negative for experienced users.

## Project Overview

1. Industries are forced to evolve and update their practices due to technological advances and the contemporary market. The banking sector is one of the most developed sectors and is always lookingfor the latesttechnological solutions that improve its efficiency.
2. Net banking websites are complex and involve navigating through a lot of pages to find the information you need. Bank staff undergoes a lot of stressful situations when communicating with clients directly. Such situations can be avoided gracefully by using chatbots.
3. Only 32% of companies in the finance industry currently use AI chatbots, and 37% are planning to start using them within 18 months said a report from Sales force. This resultsin a potential growth rate of118% which indicates the demand in the industry.
4. A smart chatbot takes a query from the user in natural language and gives the appropriate response for the same. This paper aims to discuss the relevance of chatbots in the bankingsector and explore how chatbots can be implemented using natural

language processingtechniques that can be used in the banking industry

## Purpose

1. 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 overallvirtual assistant that can facilitate customers to ask banking- related questions without visiting the bank or calling up customer service centers as well as providingthem with relevant suggestions. Hence it essentially tries to eliminatethe purpose of visiting a banking for basic queriesand procedures.
2. The main purpose of chatbots in banking is providing a better customer experience. However, they also help the staff and prevent stressful situations that arise from direct communication with clients.
3. The core purpose of banking chatbots is to provide the customers with prompt service and to improve the operational efficiency of the bank and its employees. Besides, Conversational AI in banking also assists the staff to distribute their workload.
4. Chatbots allow businesses to connect with customers in a personal way without the expense of human representatives. For example, many of the questions or issues customers have been common and easily answered.

# CHAPTER 2

## LITERATURE SURVEY

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Title** | **Keywords** | **Problem Definition** | **Methodology** | **Input Parameter** | **Result** |
| A model to develop chatbots for assisting the teaching and learning  process | Chatbots, extra school tool, middleschoo l, teaching and learning process | A model for a chatbot assisting the teaching and learning process in middle school | Google cloud technologies, firebase and dialog flow, MySQL  database, Natural language processing | Student asking queries | Student asking queries correspondi ng solution |
| Toward a chatbot for financial sustainabil ity | Chatbot,artifi cial intelligent,fin ancial sustainability, telemarkettin g,web,model, voice recognition and conversion model, | Bank revenues through customer age classification and indicate the new product-oriented fund or housing subscription savings are more suitable can be indicated. | Artificial intelligent,NLP, speech recognition technology,big data analysis. | Customer name and age,bank detail,help key feature,graphic information | Indicate that new productorient ed fund or housing subscription saving are more suitable for purchase through customer services than through chatbot. |
| Role of ai- induced chatbot in enhancing customer relationsh ip managem ent in the banking industry | Artificial Intelligence, Banking, Chatbot, Customer Experience, Customer Relationship Management | This paper will discuss how AI- induced chatbots improve  customer interaction and how chatbots play an essential role in  customer relationship management in the banking industry | Data-driven chatbots are the latest one based on the text dataset, especially conversation, which learns to deliver answers from the documents’ content, namely, man to man conversation, man to bot conversation, | Send Timely Alerts &Notifications | banking institutions should utilize this latest development to enhance customer service and customer loyalty. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  | and other forms of human conversations. |  |  |
| Chatbot for college managem ent system using AI | 1.NLP  2.sentiment analysis 3.synsets 4.word net | Use can be ask the question any college related activites throw the chatbot without physically available to the college for inquiry. The system analysis the question and answer to student | 1.Artificial intelligent 2.oerter stemmer algorithm 3.NLP | User login and complaint, chat Bot responding system, answer the complaint. | Complaint and queries regarding the electronic and answer the complaint. |

## Existing problem

**Table 2.1 LITERATURE SURVEY**

In the existing solution the chatbots produce a response delay which is the major challenge for the banking industry to serve the needs of the customers on time. While a delayed (as opposed to instant) response time positively influences novice users’ social presence perceptions, the effect is negative for experienced users. Further, we find that social presence mediates the effect of chatbot response time on usage intentions, and that this mediation is moderated by prior chatbot experience such that the indirect effect of a delayed response time on usage intentions is positive for novice users and negative for experienced users.

## References

* + - MEGANATHAN KUMAR SATHEESH et al.: ROLE OF AI-INDUCED CHATBOT IN ENHANCING CUSTOMER RELATIONSHIP MANAGEMENT IN THE

BANKING INDUSTRY DOI: 10.21917/ijms.2020.0185

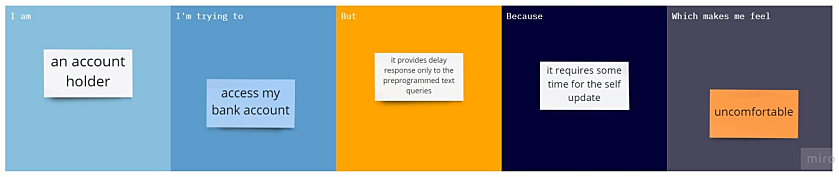
* + - A Model to Develop Chatbots for Assisting the Teaching and Learning Process.

Sensors 2022, 22, 5532. <https://doi.org/10.3390/s22155532>

* + - <https://www.sciencedirect.com/science/article/pii/S2666920X21000278?via%3Dihub>
    - <https://www.sciencedirect.com/science/article/pii/S1071581922001252?via%3Dihub>
    - <https://www.mdpi.com/2071-1050/13/6/3173>
    - [https://www.researchgate.net/publication/361265184\_Consumers%27\_behavior\_in\_c](https://www.researchgate.net/publication/361265184_Consumers%27_behavior_in_conversational_commerce_marketing_based_on_messenger_chatbots) [onversational\_commerce\_marketing\_based\_on\_messenger\_chatbots](https://www.researchgate.net/publication/361265184_Consumers%27_behavior_in_conversational_commerce_marketing_based_on_messenger_chatbots)
    - [https://www.researchgate.net/publication/327667155\_ChatBot\_For\_College\_Manage](https://www.researchgate.net/publication/327667155_ChatBot_For_College_Management_System_Using_AI) [ment\_System\_Using\_AI](https://www.researchgate.net/publication/327667155_ChatBot_For_College_Management_System_Using_AI)
    - <https://www.sciencedirect.com/science/article/pii/S2772442522000296?via%3Dihub>
    - http[s://www.sciencedirect.com/science/article/pii/S2405844022010398?via%3Dihub+](http://www.sciencedirect.com/science/article/pii/S2405844022010398?via%3Dihub%2B)

## Problem Statement Definition

* + - The first step in the problem-solving process is to determine what the problem actually is. This is an important step because you can waste time solving the wrong problem. Do not assume automatically you know what the problem is, because it may not be apparent.
    - The problem statement is a structured set of statements that describe the purpose of an effort in terms of what problem it's trying to solve.
    - In order to guide the customers throughout all the financialservices provided by the bank,an intelligent systemhas to be introduced to provide people with the best solutionpossible. The users are bank customers who need a service, available 24/7, to clear all their queries and guide them through the various bankingprocesses. So, an enhanced and smarter way of interaction with the customershas 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 betweenthe user and the bank.It is built to be the overallvirtual assistant that can facilitate customers to ask banking- related questions without visiting the bank or calling up customer service centre’s as well as providing them with relevantsuggestions.

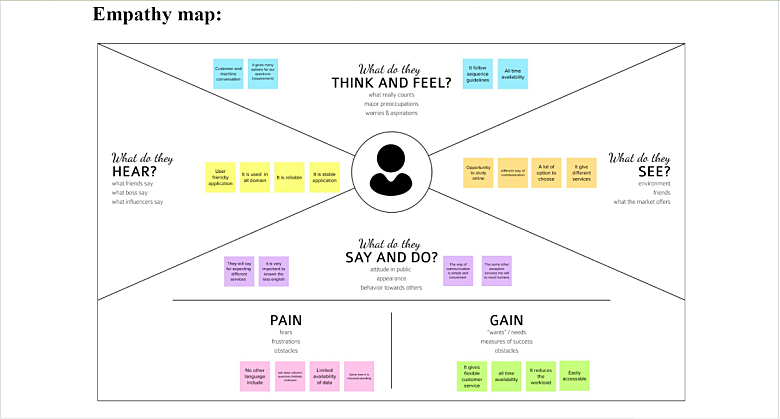


**Fig 2.1 Problem Statement**

# CHAPTER 3

## IDEATION & PROPOSED SOLUTION

* 1. **Empathy Map Canvas**
     + An empathy map is a collaborative visualization used to articulate what we know about a particular type of user. It externalizes knowledge about users in order to 1) create a shared understanding of user needs, and 2) aid in decision making.
     + An empathy map helps to map what a design team knows about the potential audience. This tool helps to understand the reason behind some actions a user takes deeply. This tool helps build Empathy towards users and helps design teams shift focus from the product to the users who are going to use the product.



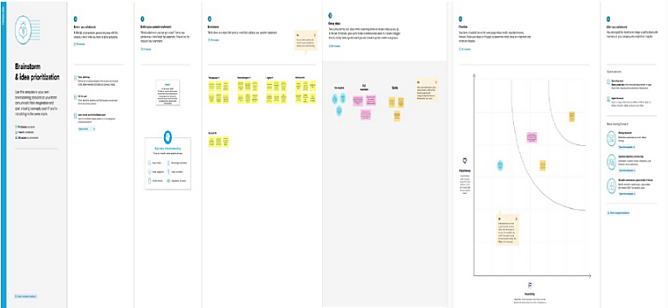
**Fig: 3.1 empathy map**

**Source:** [https://github.com/IBM-EPBL/IBM-Project-353-](https://github.com/IBM-EPBL/IBM-Project-353-1658297245/blob/main/Project%20Design%20%26%20Planning/Ideation%20Phase/Empathy%20Map%20Canvas/Empathy%20Map%20Canvas%20template.pdf)

[1658297245/blob/main/Project%20Design%20%26%20Planning/Ideation%20Phase/Empat](https://github.com/IBM-EPBL/IBM-Project-353-1658297245/blob/main/Project%20Design%20%26%20Planning/Ideation%20Phase/Empathy%20Map%20Canvas/Empathy%20Map%20Canvas%20template.pdf) [hy%20Map%20Canvas/Empathy%20Map%20Canvas%20template.pdf](https://github.com/IBM-EPBL/IBM-Project-353-1658297245/blob/main/Project%20Design%20%26%20Planning/Ideation%20Phase/Empathy%20Map%20Canvas/Empathy%20Map%20Canvas%20template.pdf)

# Ideation & Brainstorming

1. Brainstorming is an activity that will help you generate more innovative ideas. It's one of many methods of ideation—the process of coming up with new ideas—and it's core to the design thinking process.
2. Brainstorming refers to a problem-solving technique used by teams or individuals. In this process, participants generate various ideas or solutions, then begin discussing and narrowing them down to the best options
3. Frequently asked question to store in database and counting update to add the queries corresponding answer. If customer asked frequently question can be find and to feed in the database after include a voice in chatbot.



**Fig 3.2 Ideation & Brainstorming**

**SOURSE:**

[https://github.com/IBM-EPBL/IBM-Project-353-](https://github.com/IBM-EPBL/IBM-Project-353-1658297245/blob/main/Project%20Design%20%26%20Planning/Ideation%20Phase/Brainstorming%20Ideation/Brainstorming%20Ideation%20template.pdf) [1658297245/blob/main/Project%20Design%20%26%20Planning/Ideation%20Phase/Brainst](https://github.com/IBM-EPBL/IBM-Project-353-1658297245/blob/main/Project%20Design%20%26%20Planning/Ideation%20Phase/Brainstorming%20Ideation/Brainstorming%20Ideation%20template.pdf) [orming%20Ideation/Brainstorming%20Ideation%20template.pdf](https://github.com/IBM-EPBL/IBM-Project-353-1658297245/blob/main/Project%20Design%20%26%20Planning/Ideation%20Phase/Brainstorming%20Ideation/Brainstorming%20Ideation%20template.pdf)

* 1. **Proposed Solution**

1. The purpose of this tool is to provide a structured process for identifying a problem, understanding the root causes, ascertaining solution steps, and progress monitoring.
2. With a solution template, you can organize development content that you want to reuse for customer-specific solutions. Solution templates enable you to easily start the development of customer-specific solutions, for example, for a specific industry.

## Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

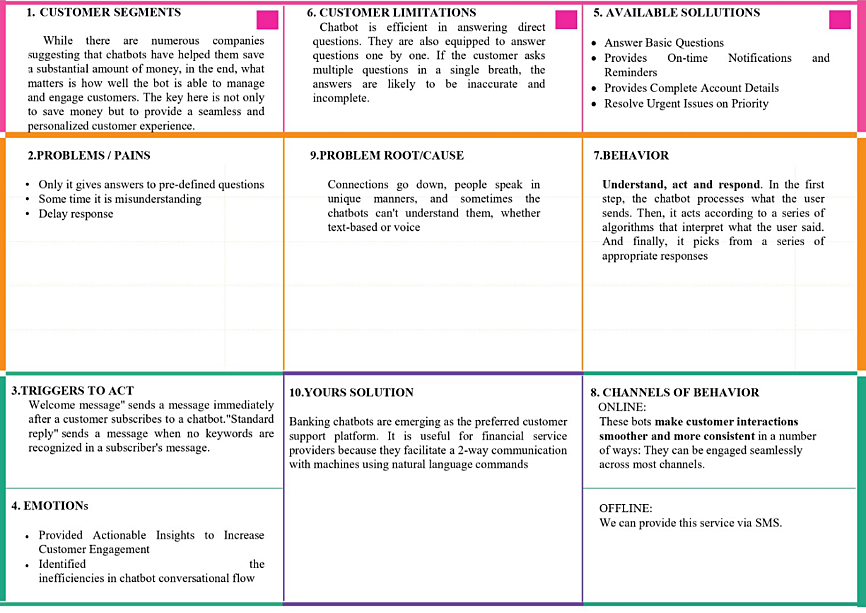
|  |  |  |
| --- | --- | --- |
| **S.NO** | **Parameter** | **Description** |
| 1. | Problem Statement (Problem to be solved) | I am an account holder I am trying to access my bank account service but it provides delay response only because preprogrammed text queries which makes me feel uncomfortable To overcome the problem of late responses of text messages being given to the customers, we include voice feature in  our chatbot. |
| 2. | Idea / Solution description | AI based cloud service with interaction  voice response enabled chatbot |
| 3. | Novelty / Uniqueness | Cloud service using Voicebot to make  the chatbot interactive |
| 4. | Social Impact / Customer Satisfaction | The customer has been satisfied with the accurate and required answer immediately. Our Chatbot gives the usage of banking facility to all customers who are all lived in distributed location. Specifically, the rural and Illiterate customers can access all banking  information and guidance. |
| 5. | Business Model (Revenue Model) | The customer problem can quick to provide a solution. They can be saving a time. So automatically our business  increased. |
| 6. | Scalability of the Solution | It is highly scalable because we provided solution to overcome the problem of late responses being given to the customers because of text messages ,we included  voicebot |

**Table 3.1 Proposed Solution**

## Problem Solution fit:

1. The Problem-Solution Fit simply means that you have found a problem with your customer and that the solution you have realized for it actually solves the customer's problem.
2. Problem-Solution Fit - this occurs when you have evidence that customers care about certain jobs, pains, and gains. At this stage you've proved the existence of a problem and have designed a value proposition that addresses your customers' jobs, pains and

gains.



**Fig 3.3 Problem Solution fit**

**Source:** https://github.com/IBM-EPBL/IBM-Project-353- 1658297245/blob/main/Project%20Design%20%26%20Planning/Project%20Design%20ph ase-I/Prepare%20Solution%20Fit.pdf

## CHAPTER 4

## REQUIREMENT ANALYSIS

* 1. Solution Requirements are identified before the technical solution is selected and/or designed. They describe the characteristics of a solution (functional and non- functional) that meet business requirements and stakeholder requirements.
  2. A solution requirement is aimed at the concerns of the people who will build and deliver the solution. It tells those people what the functional and non-functional requirements for the solution will be and how the solution will deliver on the business and stakeholder requirements. Solution Requirements – Describe the features, functions, and characteristics of a product, service, or result that will meet the business and stakeholder requirements.

## Functional requirement

Following are the functional requirements of the proposed solution.

|  |  |  |
| --- | --- | --- |
| **FR NO** | **Functional Requirement (Epic)** | **User Story / Task** |
| FR-1 | Create IBM Services | User can enable a service to Create IBM Service |
| FR-2 | Chatbot knowledge creation | User can be add a chatbot skill |
| FR-3 | Creating Savings account action | User can be add for savings account action |
| FR-4 | Creating Current account action | User can be add for current account  action |
| FR-5 | Creating Loan account action | User can be add for general query action |
| FR-6 | Creating a general query action | User can be add for loan account action |
| FR-7 | Creating a Net banking action | User can be add for net banking action |
| FR-8 | Interactive web page create | User can be looking interactive web page create |
| FR-9 | Chatbot integrate on website using flask | User can be Chatbot include on website |

**Table 4.1 Functional requirement**

## Non-Functional requirements:

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

|  |  |  |
| --- | --- | --- |
| **FR**  **NO** | **Non-Functional**  **Requirement** | **Description** |
| NFR-1 | Usability | The human work will reduce for chatbot becomes. So It is also to improve customer experience, financial companies are using chatbot to automate the majority of their duties, including addressing client complaints, responding to inquiries and resolve the problem. |
| NFR-2 | Security | The most important part of banking is the security and privacy of customer data. We must make sure that only your bank may access the information collected from customers. The customer data will stored in encrypted format in database. We can use simple encryption algorithm |
| NFR-3 | Reliability | The most important part of banking is the security and privacy of customer data. We must make sure that only your bank may access the information collected from customers. |
| NFR-4 | Performance | The chatbot's speed should be quicker than the time it would take a human to write the response. |
| NFR-5 | Availability | Anytime and anywhere of the day or night, they should be on call and prepared to respond to queries. |
| NFR-6 | Scalability | The chatbot can easy to add extra quires corresponding answer any time easy to customized using IBM Watson service |

**Table 4.2 Non-Functional requirements**

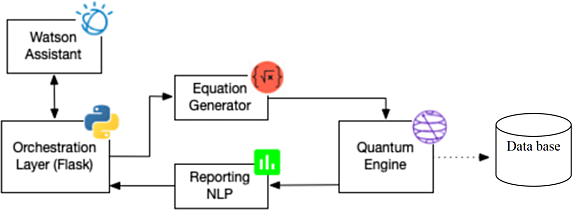
## CHAPTER 5

## PROJECT DESIGN

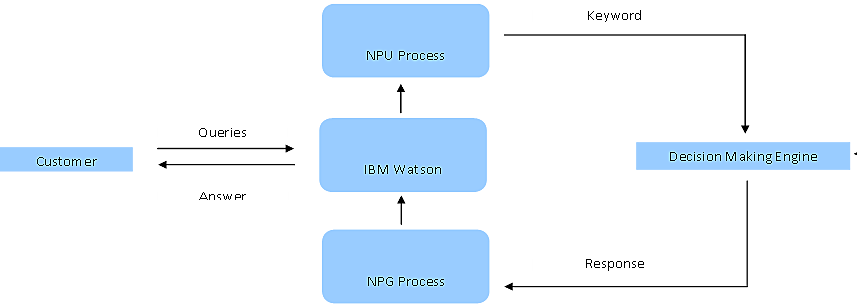
## Data Flow Diagrams

A Data Flow Diagram (DFD) is a graphical representation of the “flow” of data through an information system (as shown on the DFD flow chart Figure modeling its process aspects. Often it is a preliminary step used to create an overview of the system that can later be elaborated

## Example: [(Simplified)](https://developer.ibm.com/patterns/visualize-unstructured-text/)



**Fig 5.1 DFD Level 0 (Industry Standard)**



**Fig 5.2 Data Flow Diagrams**

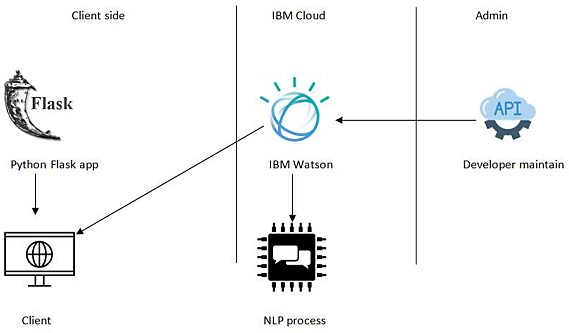
## Solution & Technical Architecture

**Technical Architecture:**

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

**Example:** Order processing during pandemics for offline mode

**Reference:** [**https://developer.ibm.com/patterns/ai-powered-backend-system-for-order-**](https://developer.ibm.com/patterns/ai-powered-backend-system-for-order-processing-during-pandemics/)[**processing-during-pandemics/**](https://developer.ibm.com/patterns/ai-powered-backend-system-for-order-processing-during-pandemics/)



**Fig 5.3 Solution & Technical Architecture**

## User Stories

|  |  |
| --- | --- |
| **User story number** | **User Story** |
| USN-1 | User can enable a service to Create IBM Service |
| USN-2 | User can be add a chatbot skill |
| USN-3 | User can be add for savings account action |
| USN-4 | User can be add for current account action |
| USN-5 | User can be add for general query action |
| USN-6 | User can be add for loan account action |
| USN-7 | User can be add for net banking action |
| USN-8 | User can be looking interactive web page create |
| USN-9 | User can be Chatbot include on website |

**Table 5.1 User Stories**

# CHAPTER 6

## PROJECT PLANNING & SCHEDULING

## Sprint Planning & Estimation

A project plan template is a document that creates a standard format for a project plan. Typically, it contains a list of the essential elements of a project, such as stakeholders, scope, timelines, estimated cost and communication methods. The project manager typically lists the information based on the assignment.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sprint** | **Functional Requirement**  **(Epic)** | **User Story**  **Number** | **User Story / Task** | **Story Points** | **Priority** | **Team Members** |
| Sprint-1 | Create IBM Services | USN-1 | User canenable a  service to Create IBMService | 5 | Highest | Thiyagarajan V |
| Sprint-1 | Chatbot knowledge  creation | USN-2 | User can be add a chatbotskill | 5 | High | Deenadhayalan V |
| Sprint-1 | Creating Savings account action | USN-3 | User canbe add for savings  accountaction | 5 | High | Logesh R |
| Sprint-1 | Creating Current account action | USN-4 | User canbe add for current account  action | 5 | High | Hariharan M |
| Sprint-2 | Creating Loan account action | USN-5 | User can be add for general query  action | 7 | Low | Thiyagarajan V |
| Sprint-2 | Creating a general  queryaction | USN-6 | User can be add for loanaccount action | 7 | Medium | DeenadhayalanV |
| Sprint-2 | Creating a Net banking action | USN-7 | User canbe add for net bankingaction | 6 | Medium | Logesh R |
| Sprint-3 | Interactive web pagecreate | USN-8 | User canbe late | 20 | High | Hariharan M |
| Sprint-4 | Chatbot integrate onwebsite using  flask | USN-9 | User can be Chatbot include on  website | 20 | High | Thiyagarajan V |

**Table 6.1 Sprint Planning**

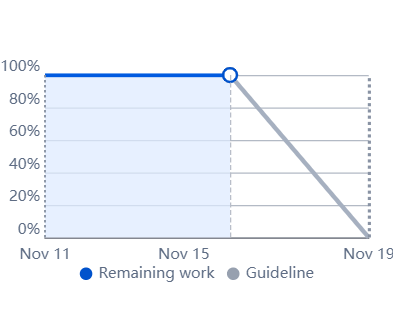
## Estimation:

## Sprint Delivery Schedule

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sprint** | **Total Story Points** | **Duration** | **Sprint Start Date** | **Sprint End Date (Planed)** | **StoryPoints Completed (as on Planned**  **End Date)** | **Sprint Release Date(Actual)** |
| Sprint-1 | 20 | 5 Days | 01 Nov 2022 | 05 Nov 2022 | 20 | 05 Nov 2022 |
| Sprint-2 | 20 | 5 Days | 06 Nov 2022 | 10 Nov 2022 | 20 | 10 Nov 2022 |
| Sprint-3 | 20 | 5 Days | 11 Nov 2022 | 15 Nov 2022 | 20 | 15 Nov 2022 |
| Sprint-4 | 20 | 5 days | 16 Nov 2022 | 19 Nov 2022 | 20 | 19 Nov 2022 |

**Table 6.2 Estimation**

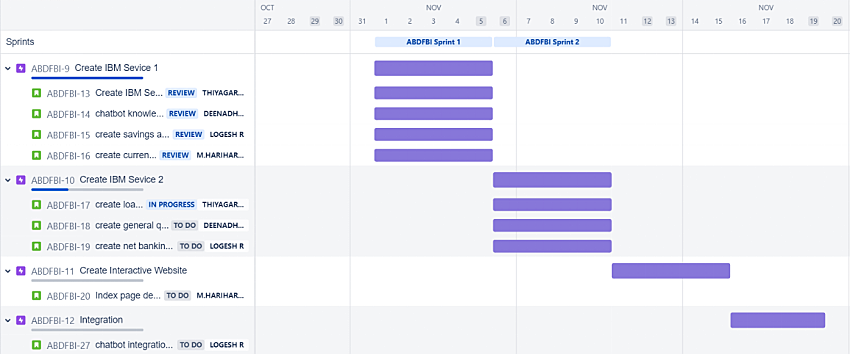
**Velocity:** Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let’s calculate the team’s average velocity (AV)



**Fig 6.1 Burndown Chart**



## Reports from JIRA



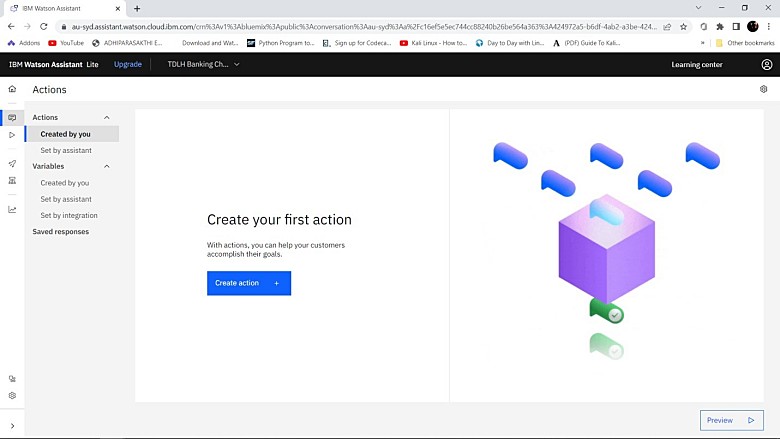
**Fig 6.2 Reports from JIRA**

## CHAPTER 7

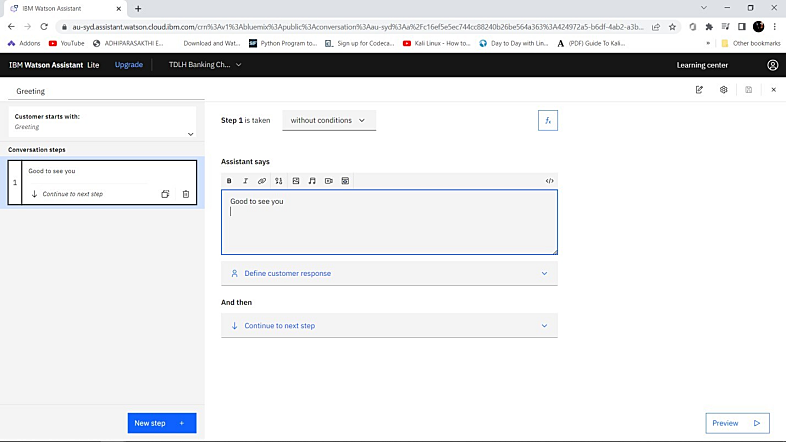
1. **CODING & SOLUTIONING (Explain the features added in the project along with code)**

## Feature

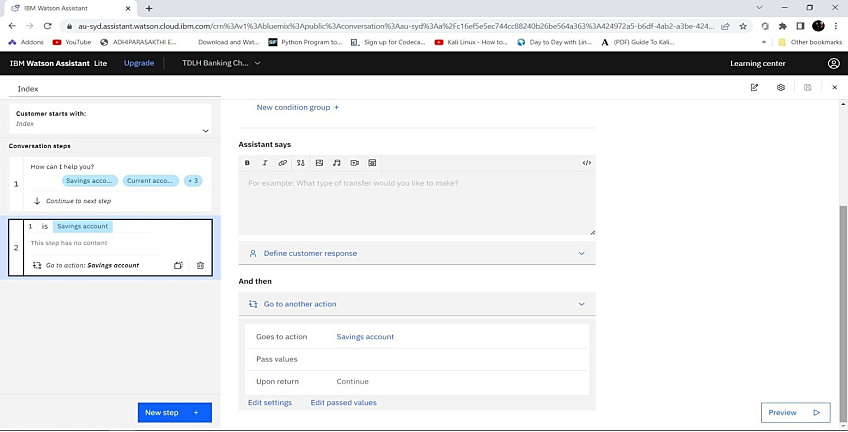
CreateIBM Service



Chatbot knowledge chatbot



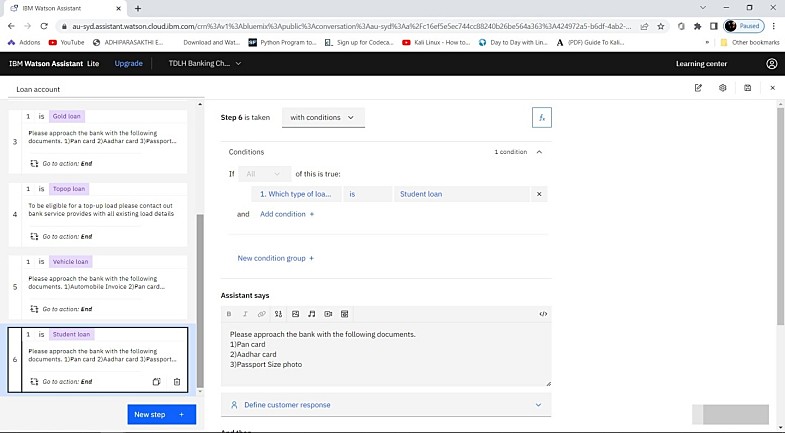
Create savings account action



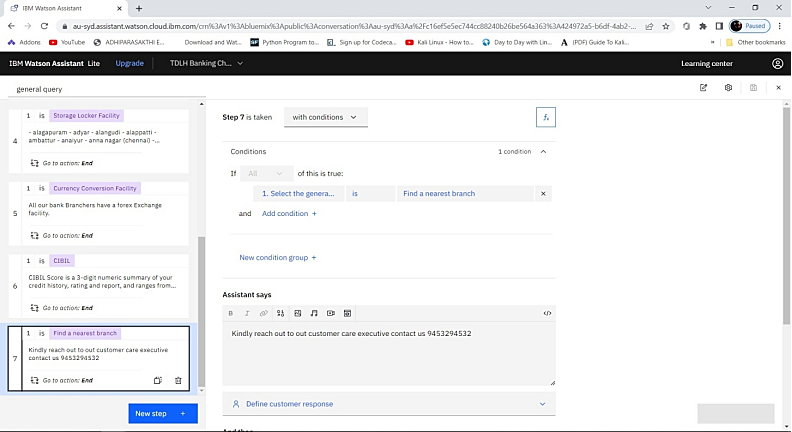
**Fig 7.1 Feature**

## Feature

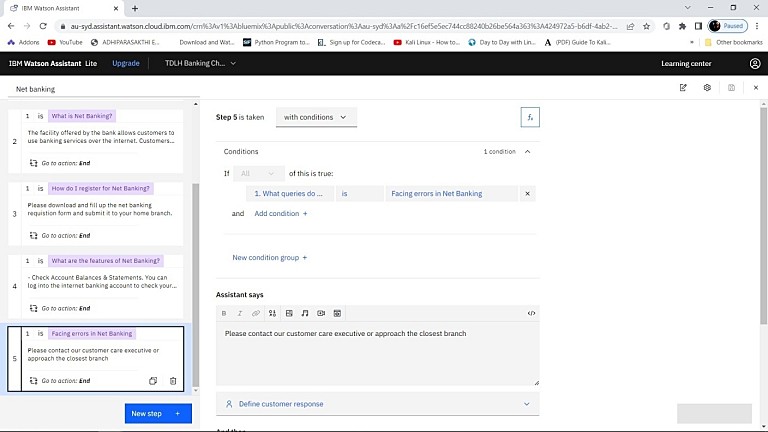
Creating Loan account action



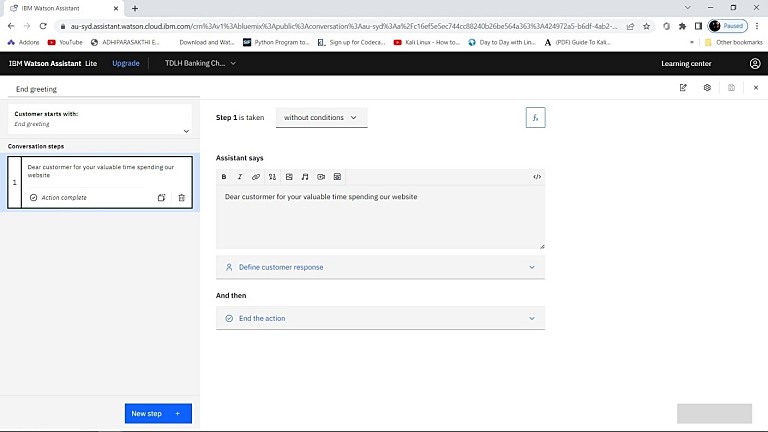
Creating a general query action



Creating a Net banking action



End Greeting



**Fig 7.2 Feature**

## CHAPTER 8

## TESTING

## Test Cases

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.NO** | **Test case ID** | **Test data** | **Expected result** | **Status** |
| 1. | Action\_TC\_OO1 | Hi | Good to see you How can I help you?  Select an action (Drop down list) | Pass |
| 2. | Action\_TC\_OO2 | Hello | Good to see you How can I help you?  Select an action (Drop down list) | Pass |
| 3. | Action\_TC\_OO3 | Regular Savings Account | Greater! Please take the following documents and head towards the nearest branch   1. Aadhar card 2. Pan Card 3. Passport Size Photos   Do you want to know about some other services?  Yes/No | Pass |

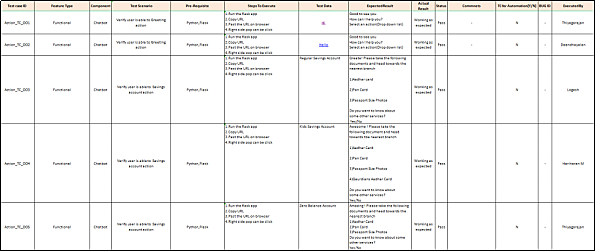
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 4. | Action\_TC\_OO4 | Kids Savings Account | Awesome! Please take the following document and head towards the nearest branch   1. Aadhar Card 2. Pan Card 3. Passport Size Photos 4. Guardians Aadhar Card   Do you want to know about some other services?  Yes/No | Pass |
| 5. | Action\_TC\_OO5 | Zero Balance Account | Amazing! Please take the following documents and head towards the nearest branch   1. Aadhar Card 2. Pan Card 3. Passport Size Photos   Do you want to know about some other services?  Yes/No | Pass |
| 6. | Action\_TC\_OO6 | Proprietorship | Awesome! Please take the following document and head towards tbe nearest branch   1. Aadhar Card 2. Pan Card 3. Passport Size Photos 4. Guardians Aadhar Card   Do you want to know about some other services? | Pass |

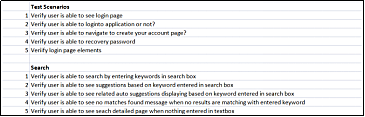
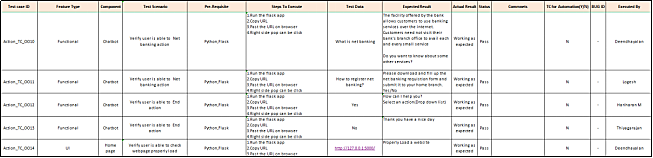
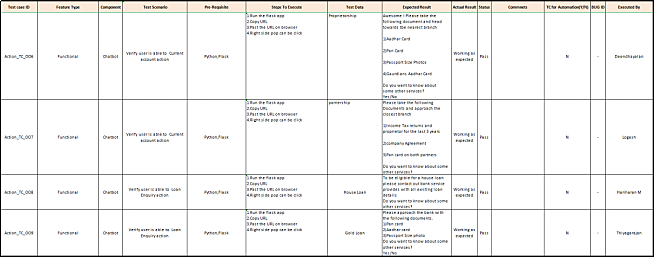
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | Yes/No |  |
| 7. | Action\_TC\_OO7 | Partnership | Please take the following Documents and approach the closest branch  1)Income Tax returns and proprietor for the last 3 years  2 ) company Agreement  3) Pan card on both partners  Do you want to know about some other services?  Yes/No | Pass |
| 8. | Action\_TC\_OO8 | House Loan | To be eligible for a house loan please contact out bank service provides with all existing loan details  Do you want to know about some other services?  Yes/No | Pass |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 9. | Action\_TC\_OO9 | Gold Loan | Please approach the bank with the following documents.   1. Pan card 2. Aadhar card 3. Passport Size photo   Do you want to know about some other services?  Yes/No | Pass |
| 10. | Action\_TC\_OO10 | What is net banking | 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  Do you want to know about some other services?  Yes/No | Pass |
| 11. | Action\_TC\_OO11 | How to register net banking? | Please download and fill up the net banking requisition form and submit it to your home branch.  Yes/No | Pass |
| 12. | Action\_TC\_OO12 | yes | How can I help you?  Select an action (Drop down list) | Pass |
| 13. | Action\_TC\_OO13 | no | Thank you have a nice day | Pass |
| 14. | Action\_TC\_OO14 | [http://127.0.0.1](http://127.0.0.1/)  :5000/ | Properly Load a website | Pass |

## User Acceptance Testing

**Table 8.1 Test Cases**





**Fig: User Acceptance Testing**

## CHAPTER 9

1. **RESULTS**

## 9.1 Performance Metrics Model Performance Testing:

Project team shall fill the following information in model performance testing template.

|  |  |  |  |
| --- | --- | --- | --- |
| **S.No.** | **Parameter** | **Values** | **Screenshot** |
| 1. | Model Summary | * IBM Watson Assistant can give for accurate responses and work for cross platform. |  |
| 2. | Accuracy | Training Accuracy - 100%  Validation Accuracy -100% |  |

**Table 9.1 Performance test Ref link:**https://github.com/IBM-EPBL/IBM-Project-353-

1658297245/blob/main/Final%20Deliverables/Performance%20Testing/GTmetrix-report- tdlh.herokuapp.com-20221118T162438-MmQL2ESX.pdf

## CHAPTER 10

## ADVANTAGES & DISADVANTAGES

## These advantages are given below:

* 1. Answer Basic Questions
  2. Provides On-time Notifications and Reminders
  3. Provides Complete Account Details
  4. Resolve Urgent Issues on Priority
  5. It gives flexible customer service
  6. All time availability
  7. It reduces the workload
  8. Easily accessible

## These Disadvantages are given below:

1. Only it gives answers to pre-defined questions
2. Some time it is misunderstanding
3. Delay response
4. No other language include
5. Ask deep relevant questions chatbot confused

# CHAPTER 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 queriesas it was meant for thatpurpose. 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 maintaingreat relationships with their customers.

## FUTURE SCOPE

The futureof 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 followingareas could have a serious impact on our scope:

* + 1. Support for multiple languages
    2. Voice and videoinstructions

## CHAPTER 12

**12. APPENDIX Source Code GitHub & Project Demo Link**

**Git hub source code link**:[https://github.com/IBM-EPBL/IBM-Project-353-](https://github.com/IBM-EPBL/IBM-Project-353-1658297245/blob/main/Final%20Deliverables/final%20code.zip) [1658297245/blob/main/Final%20Deliverables/final%20code.zip](https://github.com/IBM-EPBL/IBM-Project-353-1658297245/blob/main/Final%20Deliverables/final%20code.zip)

**Project Demo link**:<https://www.youtube.com/watch?v=JDRLMlzs3KQ>

## Project Files and Folder Structure



Fig: 12.1 Project structure

## Source code

**app.py**

from flask import Flask, render\_template,url\_for,request,redirect import feedback

app = Flask( name )

@app.route('/', methods=['POST','GET']) def Home():

return render\_template('index.html',status='')

@app.route("/Submit", methods=['POST','GET']) def Submit():

if request.method == 'POST': name = (request.form['name']) email = (request.form['email'])

phone\_number = (request.form['phone\_number']) feedback = (request.form['feedback']) Feedback.submit(name,email,phone\_number,feedback)

return render\_template('index.html',status='Form submission successful!') else:

return render\_template('index.html',status='') if name == ' main ':

app.run(debug=True,port=5000)

## feedback.py

import pyrebase

def submit(name,email\_id,phone\_number,message):

firebaseconfig={

'apiKey': "AIzaSyATsq89CuDuLCt7ccZSTZs11sHO3OR7PAc", 'authDomain': "tdlh-banking-feedback.firebaseapp.com", "databaseURL":"https://tdlh-banking-feedback-default-rtdb.firebaseio.com", 'projectId': "tdlh-banking-feedback",

'storageBucket': "tdlh-banking-feedback.appspot.com", 'messagingSenderId': "336462584761",

'appId': "1:336462584761:web:0a185c120d1fb303fe7468",

'measurementId': "G-8F8FJRHXCK", "serviceAccount": "Key/key.json"

}

firebase=pyrebase.initialize\_app(firebaseconfig) #auth=firebase.auth()

db=firebase.database()

feedback={'Name': name,'Phone Number': phone\_number,'Email Id':email\_id,'Feedback': message}

db.push(feedback)

**requirements.txt** emails==0.6 Flask==2.2.2 gcloud==0.18.3

googleapis-common-protos==1.57.0 gunicorn==20.1.0

Jinja2==3.1.2 numpy==1.23.4 pandas==1.5.1 Pillow==9.2.0 Pyrebase4==4.5.0 requests==2.27.1 scikit-learn==1.1.3 scipy==1.9.3 seaborn==0.12.1 secure-smtplib==0.1.1 sklearn==0.0.post1 virtualenv==20.16.6

## styles.css

Link: <https://github.com/Thiyagarajan2001/TDLH_source/blob/main/static/styles.css>

## [map-image.png](https://github.com/Thiyagarajan2001/TDLH_source/blob/main/static/assets/img/map-image.png) & [header-bg.jpg](https://github.com/Thiyagarajan2001/TDLH_source/blob/main/static/assets/img/header-bg.jpg)

Link:<https://github.com/Thiyagarajan2001/TDLH_source/tree/main/static/assets/img>

## [static](https://github.com/Thiyagarajan2001/TDLH_source/tree/main/static)/[assets](https://github.com/Thiyagarajan2001/TDLH_source/tree/main/static/assets)/[img](https://github.com/Thiyagarajan2001/TDLH_source/tree/main/static/assets/img)/team/1.jpg & [static](https://github.com/Thiyagarajan2001/TDLH_source/tree/main/static)/[assets](https://github.com/Thiyagarajan2001/TDLH_source/tree/main/static/assets)/[img](https://github.com/Thiyagarajan2001/TDLH_source/tree/main/static/assets/img)/team/2.jpeg & [static](https://github.com/Thiyagarajan2001/TDLH_source/tree/main/static)/[assets](https://github.com/Thiyagarajan2001/TDLH_source/tree/main/static/assets)/[img](https://github.com/Thiyagarajan2001/TDLH_source/tree/main/static/assets/img)/team/3.jpeg & [static](https://github.com/Thiyagarajan2001/TDLH_source/tree/main/static)/[assets](https://github.com/Thiyagarajan2001/TDLH_source/tree/main/static/assets)/[img](https://github.com/Thiyagarajan2001/TDLH_source/tree/main/static/assets/img)/team/4.jpeg

Link:<https://github.com/Thiyagarajan2001/TDLH_source/tree/main/static/assets/img/team>