PROJECT REPORT
AI BASED DISCOURSE FOR BANKING INDUSTRY
Team ID: PNT2022TMID28677

Batch: B8-2A4E

TEAM LEADER:

Name: MANIKANDAN R

Register Number: 410719104051

TEAM MEMBERS:

Name: JANANI M

Register Number: 410719104034

Name: B SRIJA

Register Number: 410719104101

Name: SRIRAM S

Register Number: 410719104102

TABLE OF CONTENTS

1.INTRODUCTION

1.1 PROJECT OVERVIEW

Banking chatbot is an AI application that perceives and executes the banking transactions of customers. In banking, chatbots provide opportunities to automate the relationship between the consumer and the bank.

1.2 PURPOSE

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. Artificial intelligence may assist customers in many ways.

2.LITERATURE SURVEY

2.1 EXISTING PROBLEM

Along with the banking industry's digital transformation, comes significant challenges in the operational model as well as customer and business strategy to remain competitive. Given in this article are few of the real-life challenges faced by banks, and the strategies adopted by the banks to succeed in the coming year and mitigate the risk posed by these challenges. Overcoming these challenges is not easy and the transition from legacy systems to innovative solutions requires various coordinated steps to survive but thrive in the current landscape.

The banking industry is undergoing a radical shift fueled by ever-changing technology, competitive landscape driven by new FinTechs, evolving business models, mounting regulation and compliance pressures, and new disruptive technologies.

2.2 REFERENCES

Domain Name: Banking and Finance

Use case Name: AI-based discourse for Banking Industry

Paper 1

Authors: Amisha Gupta, Deepti Sharma

Year: 2019

Title: Customers' Attitude towards Chatbots in the Banking Industry of India

Methodology: This research investigates the customer's attitude towards chatbots in the

Banking Industry of India. The author used correlation analysis to determine and understand the

attitude of customers toward the acceptance and adoption of chatbots in the banking industry.

Data is collected through a Primary survey. 100 people were targeted, out of which 72

responded. The study concludes a positive correlation between attitude and the adoption of

chatbots.

Advantage: Artificial Intelligence involves creating machines that are capable of simulating

knowledge. It also explores the existing usability of chatbots to assess whether they can fulfil

customers' ever-changing needs.

Disadvantage: The dialogue capability can be limited to very a very specific set or format of

questions that are established by the chat bot development team.

Paper 2

Authors: Yomna Abdulla, Rabab Ebrahim, Sumathi Kumaraswamy

Year: 2020

Title: Artificial Intelligence in the Banking sector: Evidence from Bahrain

Methodology: Artificial intelligence applications and robotic process automation for chatbots

are discussed. The findings highlight that a high priority is given to the digital transformation

journey in banks, which suggests that further development and implantation of technology in

banks will be seen in the near future.

Advantage: AI can be best described as the computerized processes that employ knowledge,

reasoning, and communication that aids smart decision-making by chatbots in banks.

Disadvantage: The banking sector faces significant challenges relating to security, risk

management,and inefficiency that decrease the overall performance of banks.

Paper 3

Authors: Caldarini, G. Jaf, S. McGarry, K

Year: 2021

Title: A Literature Survey of Recent Advances in Chatbots.

Methodology: Chatbots are intelligent conversational computer systems designed to mimic

human conversation to enable automated online guidance and support. The increased benefits

of chatbots led to their wide adoption by many industries in order to provide virtual assistance

to customers. Chatbots utilize methods and algorithms from two Artificial Intelligence

domains: Natural Language Processing and Machine Learning. However, there are many

challenges and limitations in their application.

Advantage: AI can be best described as the computerized processes that employ knowledge,

reasoning, and communication that aids smart decision-making by chatbots in banks.

Disadvantage: The banking sector faces significant challenges relating to security, risk

management,and inefficiency that decrease the overall performance of banks.

Paper 4

Authors: Shashank Bairy, Rashmi R

Year: 2021

Title: Conversation to Automation in Banking through Chat bot Using Artificial Machine

Intelligence Language

Methodology: Chatbot is a software application that listens to a user's query in natural language

and responds accordingly. There is the rapid adoption of the latest technologies in banking and

chatbots are one of them. Answering customer queries and assisting customers with banking

transactions are some of the ways in which it's making an impact on the industry.

Advantage: Net-banking websites are complex and involve navigating through a lot of pages to

find the information that users need. Bank staff undergoes a lot of stressful situations when

communicating with clients directly. Such situations can be avoided gracefully by using chatbots

with AI.

Disadvantage: Chatbots cannot hold the conversation which means it cannot answer multiple

questions at the same time.

Paper 5

Authors: Khavya.K

Year: 2018

Title: Artificial Intelligence in the Banking sector: Evidence from Bahrain

Methodology: In this project, we are trying to perform a few of the basic banking operations

via chatbots. Now bots in banking sectors are only used to give guidelines but in this bot, we

perform banking operations for a list of a few banks.

Advantage: AI can be best described as the computerized processes that employ knowledge,

reasoning, and communication that aids smart decision-making by chatbots in banks.

Disadvantage: The banking sector faces significant challenges relating to security, risk

management,and inefficiency that decrease the overall performance of banks.

Paper 6

Authors: Dr.Anil B Malali, Dr.S.Gopalakrishnan

Year: 2020

Title: Application of Artificial Intelligence and Its Powered Technologies in the Indian Banking

and Financial Industry

Methodology: Examine the dynamics of AI ecosystems in the banking and financial industry and

how it is fast becoming a most important disrupter by looking at some of the critical unsolved

problems in this area of business

Advantage: AI will empower banking organizations to completely redefine how they operate,

establish innovative products and services, and most importantly impact customer experience

interventions.

Disadvantage: AI and ML are replacing human analysts in business activities since human

selection involves high costs.

Paper 7

Authors: Netra Pal Singh, Devender Singh

Year: 2019

Title: Chatbots and Virtual Assistants in Indian Banks.

Methodology This paper discusses the adoption of chatbots and virtual Assistants by different

categories of banks (private sector banks and public sector banks) in India. The research paper

presents a brief introduction to the banking industry in India, its history, characteristics, and the

architecture of chatbots and virtual assistants. The research paper also included basic features,

ways to connect, services offered, accuracy, and technology providers of chatbots and virtual

assistants implemented by Indian banks.

Advantage: AI can be best described as the computerized processes that employ knowledge,

reasoning, and communication that aids smart decision-making by chatbots in banks.

Disadvantage: The banking sector faces significant challenges relating to security, risk

management,and inefficiency that decrease the overall performance of banks.

2.3 PROBLEM STATEMENT DEFINITION

Problem Statement:

A Banking sector is an industry that requires 24/7 interaction in some or other form with the bank account holders and users. This is something that should be looked up to because unlike machines, humans cannot interact and clarify problems all the time. Also, banking employees have feelings and cannot stand situations where questions are asked repeatedly. Problems also arise from customer's point of view when they aren't given an appropriate explanation. Thus, we bring our AI-based chatbots into play. Chatbots are AI-based agents

which take the place of an employee who is available to give basic details to the customer. It also acts as a guide for people who are new to the banking process

I am	I'm trying to	But	Because	Which makes me feel
user with the new bank account	comprehend more about the available features of the bank	It's time consuming at the bank	I require a bank employee to clarify my doubts	Annoyed

I am	I'm trying to	But	Because	Which makes me feel
new customer	learn more about banking	There is more information to remember	process is so long	frustrated

| I am	I'm trying to	But	Because	Which makes me feel
an existing customer at the bank	check on my bank statement	I have to travel to the bank now and then	I have to get my work done	exhausted

3.IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

Empathy Map:

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes.

It is a useful tool to helps teams better understand their users.

Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.
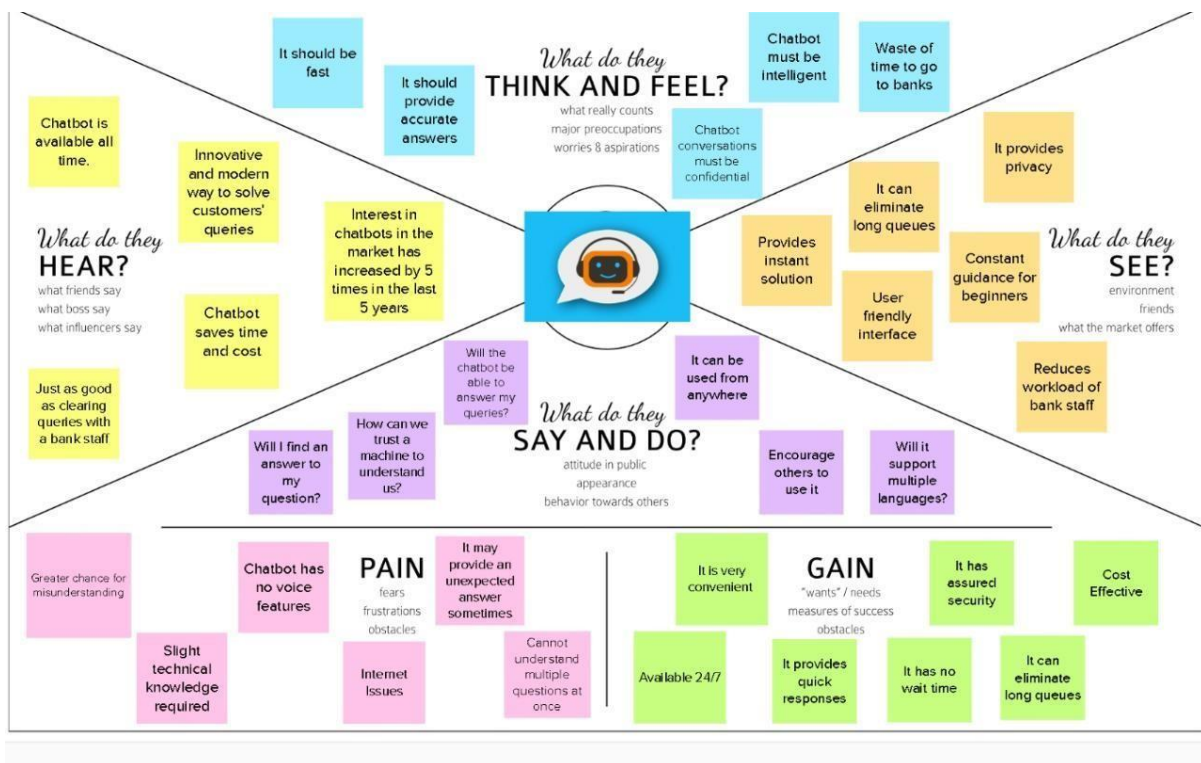
3.2 IDEATON & BRAINSTORMING

Step-1: Team Gathering, Collaboration and Select the Problem Statement
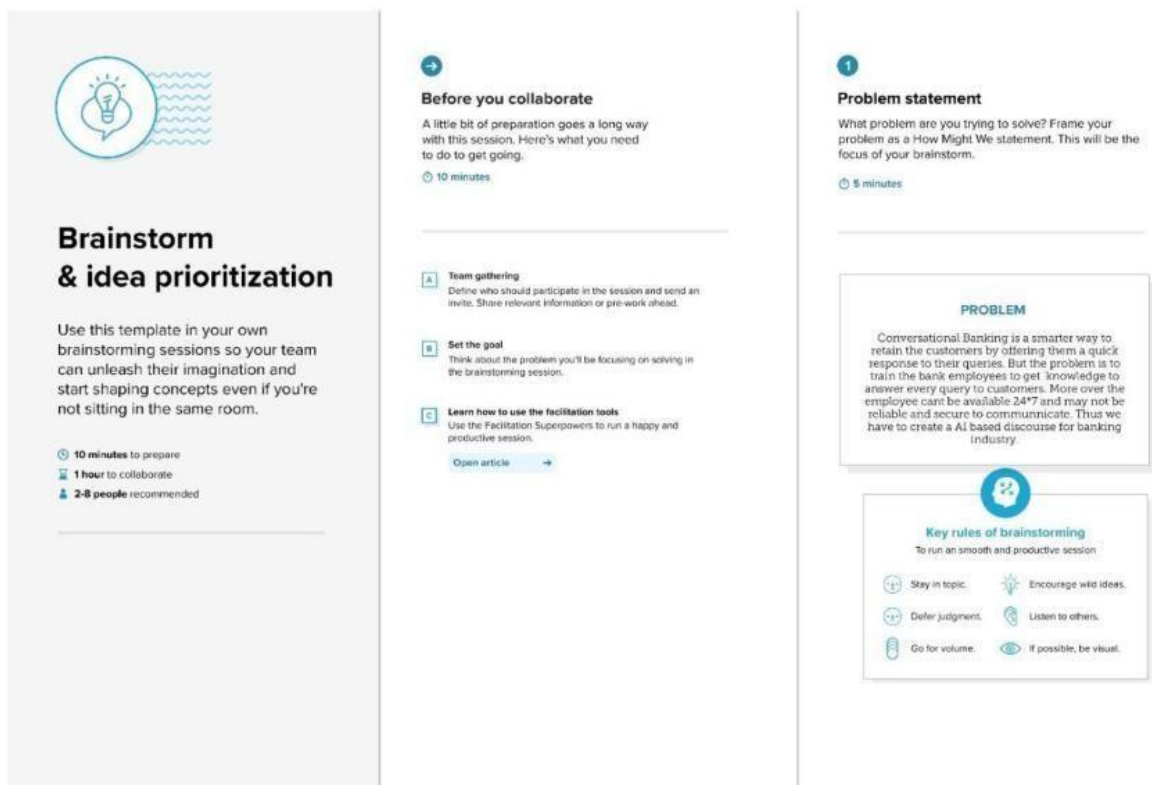
Step-2: Brainstorm, Idea Listing and Grouping

2

Brainstorm

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

⏱ 10 minutes

TIP
You can select a sticky note
and hit the pencil [switch to
sketch] icon to start drawing!

Manikandan R

Used in banking industry	Can handle customers easily	User Friendly
More training	Used in more than 30 languages	Detect Spelling mistakes
Can Use Voices	Easily Accessible	Clarity on thoughts

Sriram S

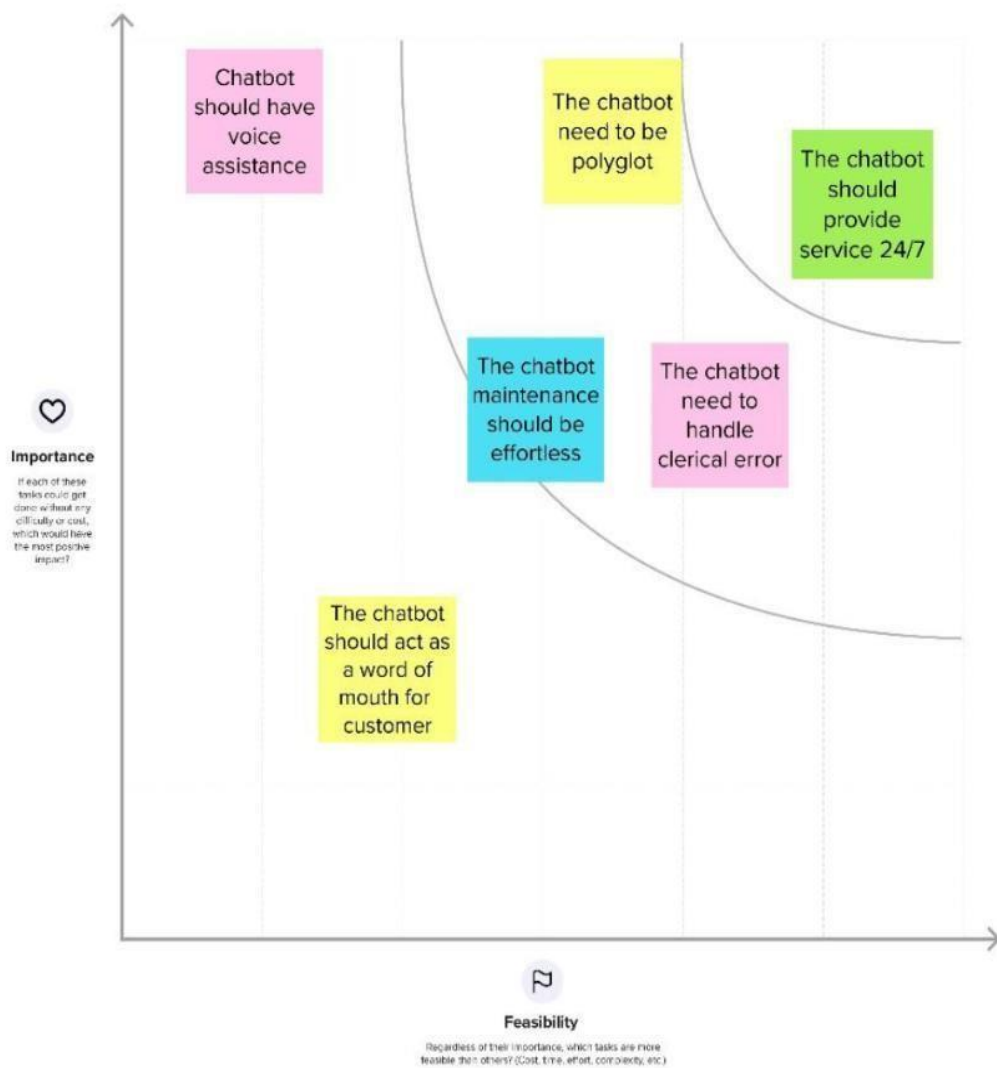|		
Time Saving	Real time application	Limited number of queries
Used in banking sector	Has clear user guide	improve accuracy
Good user interaction	Easily Accessible	Clarity on solutions

B Srija

Data Entry	Interactive Settings	Limited number of queries
Quick launch	Has clear user guide	Feasible
Test analysis	Secure	Private

Janani M

Efficient	Solve complex problems	Limited number of queries
Clarity	Solution in step by step process	Feasible
Test analysis	Secure	Any Documents

11

Step-3: Idea Prioritization

Importance

If each of these tasks could get done without any difficulty or cost, which would have the most positive impact?

Feasibility

Regardless of their importance, which tasks are more feasible than others? (Cost, time, effort, complexity, etc.)

Chatbot should have voice assistance

The chatbot need to be polyglot

The chatbot should provide service 24/7

The chatbot maintenance should be effortless

The chatbot need to handle clerical error

The chatbot should act as a word of mouth for customer

3.3 PROPOSED SOLUTION

Proposed Solution Template:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Customer satisfaction is hampered by bank's inability to consistently respond satisfactorily to inquiries from customers about their products or services. Customers must regularly visit banks to get simple answers.
2.	Idea / Solution description	To give clients the greatest possible answer, an intelligent system must be implemented to lead the customers through all of the financial services offered by the bank..
3.	Novelty / Uniqueness	AI-powered chatbots should be able to respond to any general banking questions including opening an account, loans, net banking, other services, etc. It quickly and effectively responds to client questions while being economical.
4.	Social Impact / Customer Satisfaction	Chatbot will provide personalised and effective contact between the user and the bank in order to address the user satisfaction issues related to banking services. It is designed to serve as the all-encompassing virtual assistant that enables users to ask banking-related queries without going to the bank or calling customer care centres and to receive pertinent recommendations.
5.	Business Model (Revenue Model)	An inexpensive way for banks to answer client questions is by using a chatbot. It does away with the necessity for a sizable customer service team and even lessens the workload for bank employees, whose time may be better spent elsewhere.
6.	Scalability of the Solution	AI chatbots offer round-the-clock assistance to address all consumer questions and direct them through the entire banking procedure. It maintains a private interaction with consumers and includes voice assistance features. It may be adjusted to meet the needs of the bank and can contain answers to questions about any new feature or service the bank introduces.

3.4 PROPOSED SOLUTION FIT

Problem-Solution fit canvas 2.0

Purpose / Vision: **AI Based discourse for banking industries**

1. CUSTOMER SEGMENT(S) — CS

Who is your customer?
i.e. working parents of 0-5 y.o. kids

- New clients who want to learn more about the bank and how to open an account.
- Existing customers who want to utilize the bank's different features and services.

6. CUSTOMER CONSTRAINTS — CC

What constraints prevent your customers from taking action or limit their choices of solutions? i.e. spending power, budget, no cash, network connection, available devices.

- Network connectivity is necessary
- Unable to effectively communicate about the problems via chats.
- Security and privacy concerns
- Improper compliance about the issues
- Bewilderment with chatting, especially among the elders

5. AVAILABLE SOLUTIONS — AS

Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons do these solutions have? i.e. pen and paper is an alternative to digital notetaking

Bank employees and customer service hotlines are available to answer customers queries. Both of these existing approaches take a lot of time and may require consumer to wait a lengthy period for their replies. These problems can be resolved by the chatbot. A chatbot can squash these issues as they can provide answers instantly at any time from the convenience of the customer. The chatbots are able to provide greater assistance.

Explore AS, differentiate

2. JOBS-TO-BE-DONE / PROBLEMS — J&P

Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.

- Banking convenience at any time and everywhere
- Giving accurate and timely responses to consumer inquiries.
- Cost and time effectiveness will be increased
- Guidance about the banking doubts can be ensured

9. PROBLEM ROOT CAUSE — RC

What is the real reason that this problem exists? What is the back story behind the need to do this job? i.e. customers have to do it because of the change in regulations.

- When executing certain activities in banking, which can initially be a little difficult, consumers occasionally may need assistance or direction.
- As banking is essential, a lot of people need their questions answered, which necessitates a large workforce to meet demand, which can be highly expensive and yet take a while.
- To stay up with evolving regulations that may cause misunderstanding, banks may periodically roll out new services or update old ones.

7. BEHAVIOUR — BE

What does your customer do to address the problem and get the job done? i.e. directly related: find the right solar panel installer, calculate usage and benefits; indirectly associated: customers spend free time on volunteering work (i.e. Greenpeace)

Customers who use banks frequently have questions about opening new accounts, getting loans, or other common banking issues.
Currently, they have two options: they may contact customer service lines, or they can go to a bank in person, wait in line, and then interact with a bank employee to get their questions answered. It might be aggravating when telephone lines are even known to have long wait times.

Focus on J&P, tap into BE, understand RC

3. TRIGGERS — TR

What triggers customers to act? i.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news.

A Positive word-of-mouth regarding how convenient and simple it is to utilise, and about the efficiency of usage.

10. YOUR SOLUTION — SL

If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality.
If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour.

Customers can use an AI-based chatbot that the bank can embed in its website. The consumer may then use this at any time of day or from any location as long as they have an internet connection to promptly resolve their questions. In turn, this lessens the need for banks to hire big personnel to handle client inquiries. It is an extremely effective and satisfying solution to the issue because the clients' questions are addressed accurately and convenience.

8. CHANNELS of BEHAVIOUR — CH

8.1 ONLINE
What kind of actions do customers take online? Extract online channels from #7

They explore online and need it's help for answers for their queries, which are typically dispersed and unreliable.

8.2 OFFLINE
What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.

* To get answers to their queries, they visit banks, speak with bank employees.

Extract online & offline CH of BE

4. EMOTIONS: BEFORE / AFTER — EM

How do customers feel when they face a problem or a job and afterwards? i.e. lost, insecure > confident, in control - use it in your communication strategy & design.

Before: Clueless, Helpless, afraid, anxious
After: Trustiness, confidence, comfort

Identify strong TR & EM

Define CS, fit into CC
Focus on J&P, tap into BE, understand RC

★ AMALTAMA

4.REQUIREMENT ANALYSIS

4.1 FUNCTONAL REQUIREMENTS

1. Channels

2. Chat interface and conversational UI

3. Rich actionable messaging

4. Security

5. Natural Language Processing
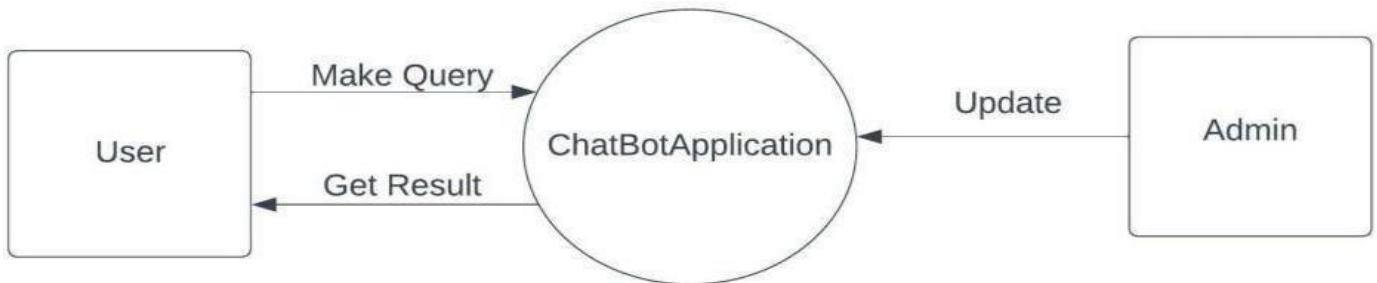
6. Fallback to humans

4.2 NON-FUNCTIONAL REQUIREMENTS

1. The product should be open-source and published under MIT license.

2. The bot should reply under 30 seconds to users' queries.

3. Talking to the bot should feel like talking to a person (the bot should not reply instantly, 1-2 second delay between responses).

4. There are 3 kinds of users .

5. The users have to authenticate themselves before being able to query information from the bot.

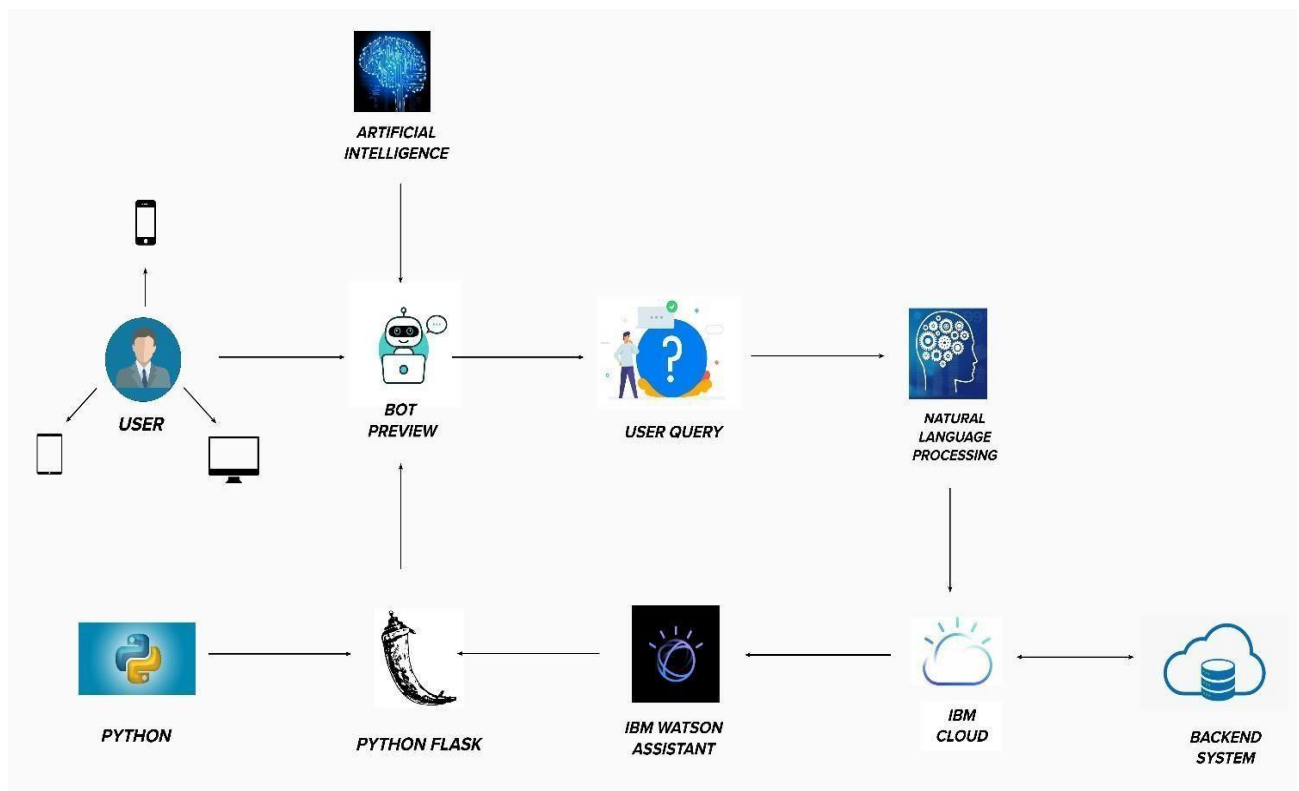# 5.PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS

LEVEL 0

LEVEL 1

LEVEL 2

User → **Make Query** → Select category

Select category → Enter Query

Enter Query → Fetch Query

Fetch Query → Query Database

Query Database → **Process Query** → Get Result

Get Result → **Output of the Query** → User
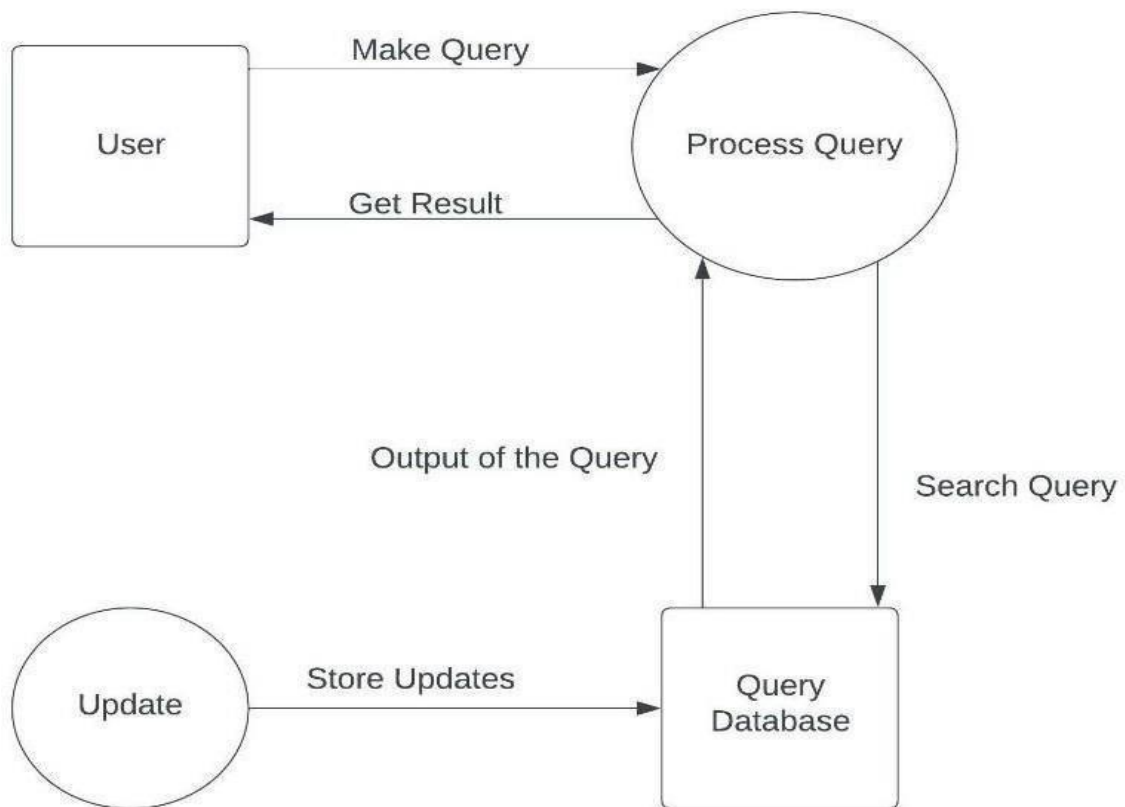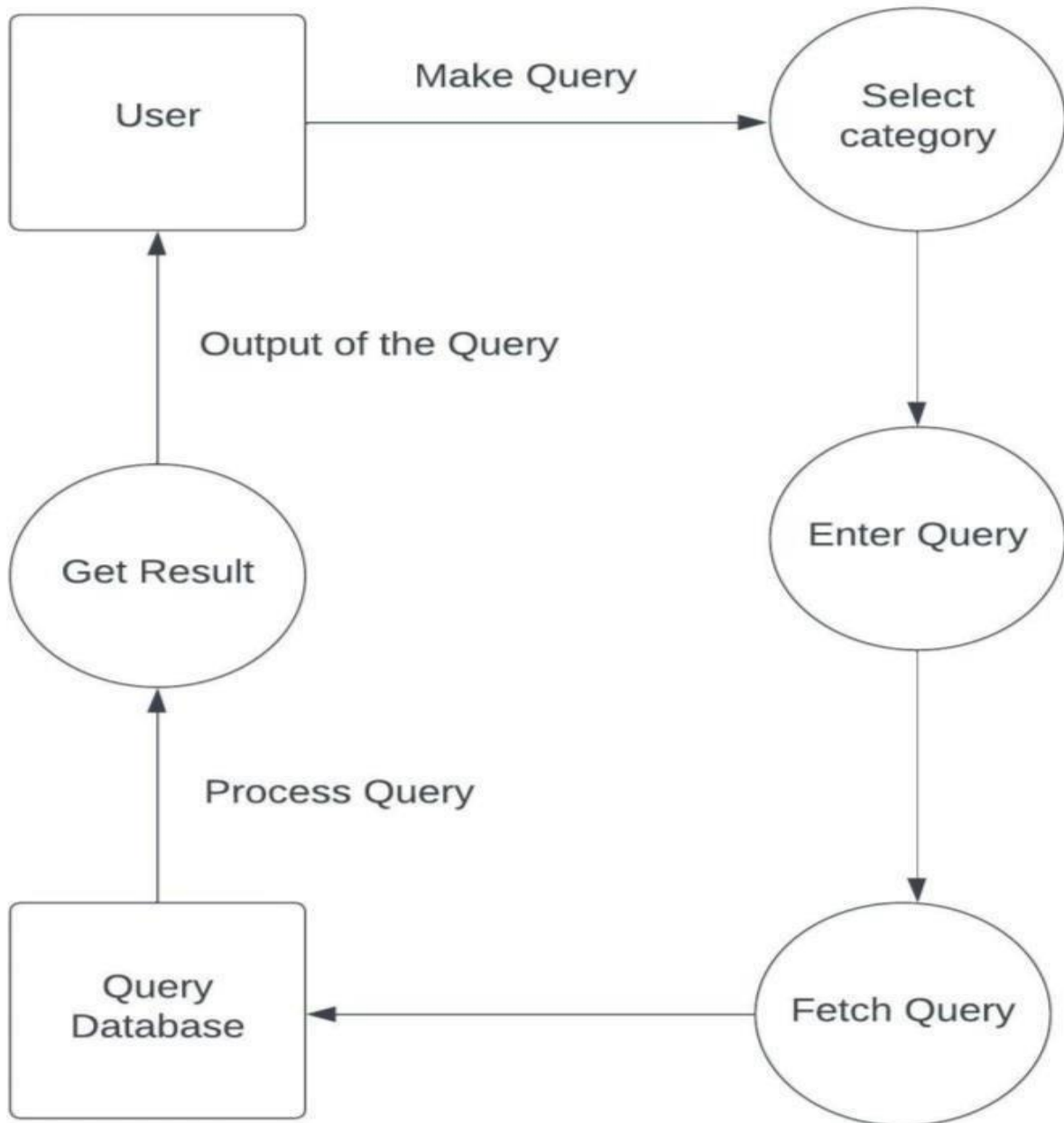
5.2 SOLUTION AND TECHNICAL ARCHITECTURE

Technical Architecture Steps:

1. User inquiries sent to the chatbot
2. The question is previewed by the bot.
3. The inquiry is sent to Watson Assistant.
4. The query is comprehended using Natural Processing Language.
5. The question is sent by Watson Assistant
6. Watson pulls pertinent information from a cloud database.
7. Cloud databases are used to store queries and responses (both sent and received).
8. The bank receives all inquiries and pertinent data for review.

Technical Architecture:
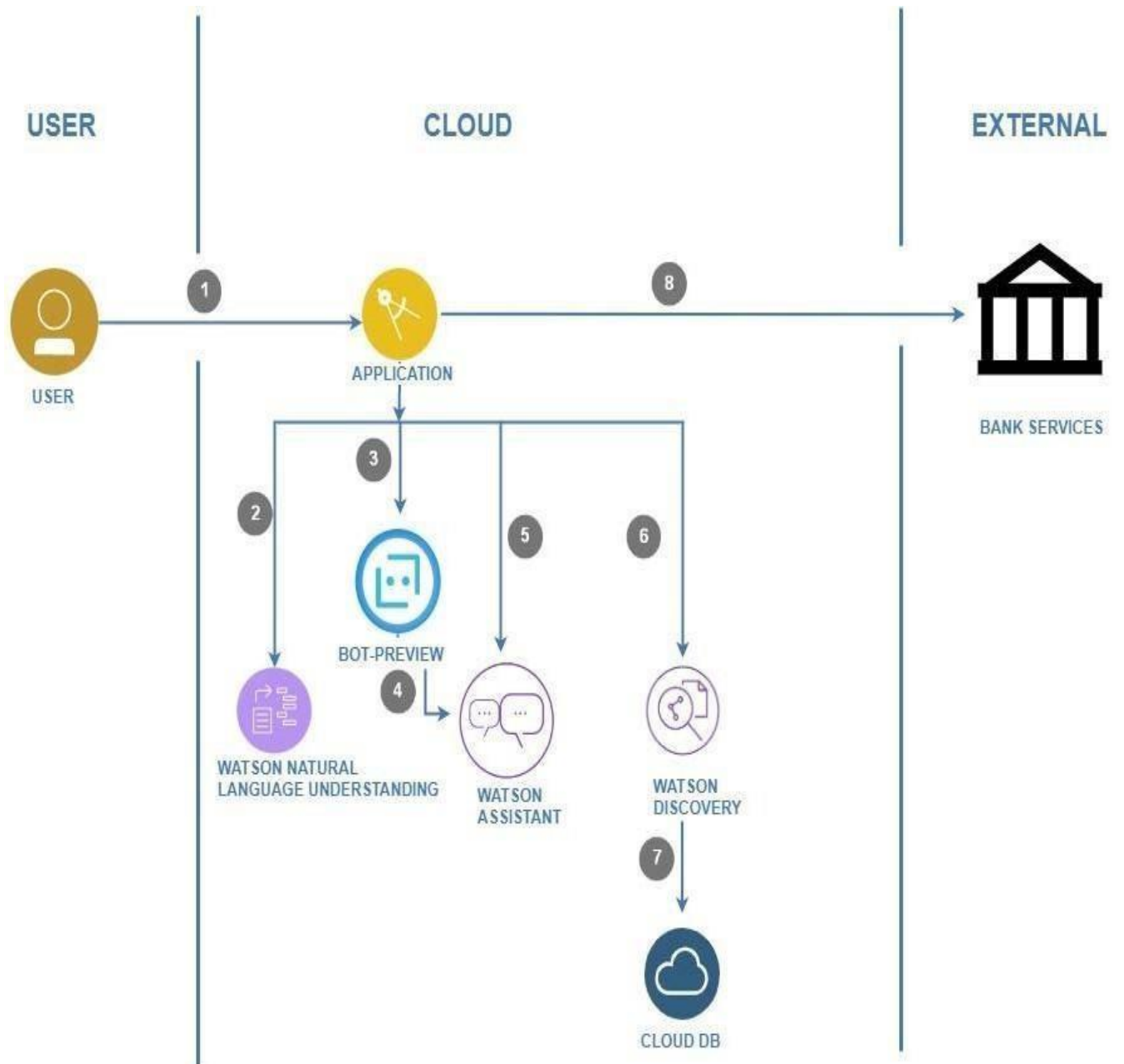
5.3 USER STORIES

Top 5 benefits of banking chatbots

For users:

Ease of use: Chatbots, which are getting easier to access and smarter, can be integrated into many platforms such as conversational platforms, mobile applications or websites. Thus, the banking actions can be executed by communicating with chatbots.

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

Increase in user engagement: Banks constantly create new campaigns and personalized financial plans. Chatbots can make it easier for a user to choose the appropriate products for them and obtain information based on storing previous interactions' data and accessing customers' information.

For banks:

4. Reduced costs: Deployment of a chatbot is cheaper and faster than the development of customer service and hiring employees. Chatbots serve 24/7 and a chatbot platform can serve numerous customers.

5. Fraud reduction: One of the problems frequently encountered by credit card users is online theft and fraud. Banks are developing AI systems to prevent fraud. If chatbots can keep users aware of suspicious transactions, frauds can be minimized

6.PROJECT PLANNING AND SCHEDULING

6.1 SPRINT PLANNING AND ESTIMATION

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Create IBM Service	USN-1	As a user, I can see a Watson Assistant.	1	High	R Manikandan Sriram S
Sprint-1	Chatbot Skills Creation	USN-2	As a user, I will see the Chatbot having banking-related skills.	1	High	B Srija Janani M
Sprint-2	Creating Saving Account Action	USN-3	As a user, I can converse with the chatbot regarding saving account-related queries.	2	Medium	Janani M B Srija
Sprint-2	Creating Current Account Action	USN-4	As a user, I can converse with the chatbot regarding current account-related queries.	2	Medium	B Srija R Manikandan
Sprint-3	Creating Loan Account Action	USN-5	As a user, I can converse with the chatbot regarding loan account-related queries.	2	High	Janani M Sriram S

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-3	Creating General Query Action	USN-6	As a user, I can converse with the chatbot regarding general queries.	2	Medium	Janani M Sriram S B Srija
Sprint-3	Creating Net Banking Action	USN-7	As a user, I can converse with the chatbot regarding net banking-related queries.	2	High	R Manikandan Sriram S
Sprint-4	Creating Assistant & Integrate With Flask Web Page (Build Python Code)	USN-8	As a user, I can see a flask web page for bank.	1	Low	R Manikandan Sriram S

| Sprint-4	Build HTML Code	USN-9	As a user, I can web pages integrated with a chatbot.	1	Medium	R Manikandan B Srija Janani M
Sprint-4	Run The Application	USN-10	As a user, I can communicate with the chatbot 24*7.	1	Low	R Manikandan B Srija Sriram S Janani M

6.2 SPRINT DELIVERY SCHEDULE

| Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	27 Oct 2022
Sprint-2	20	6 Days	27 Oct 2022	05 Nov 2022	20	30 Oct 2022
Sprint-3	20	6 Days	29 Nov 2022	12 Nov 2022	20	02 Nov 2022
Sprint-4	20	6 Days	02 Nov 2022	19 Nov 2022	20	05 Nov 2022

6.3 REPORTS FROM JIRA

Road Map:

A roadmap is a strategic plan that defines a goal or desired outcome and includes the major steps or milestones needed to reach it. It also serves as a communication tool, a high-level document that helps articulate strategic thinking the why behind both the goal and the plan for getting there.
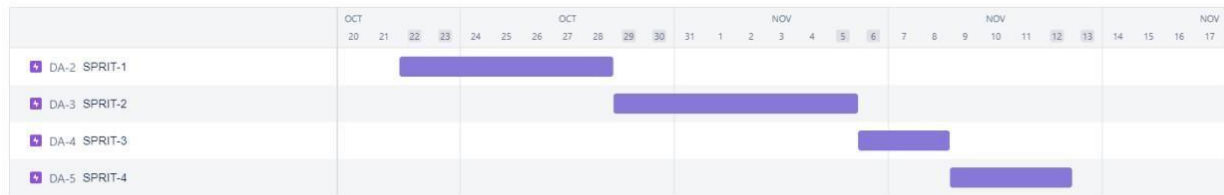
Kanban Board:

      A kanban board is an agile project management tool designed to help visualize work, limit work-in-progress, and maximize efficiency (or flow). It can help both agile and DevOps teams establish order in their daily work.
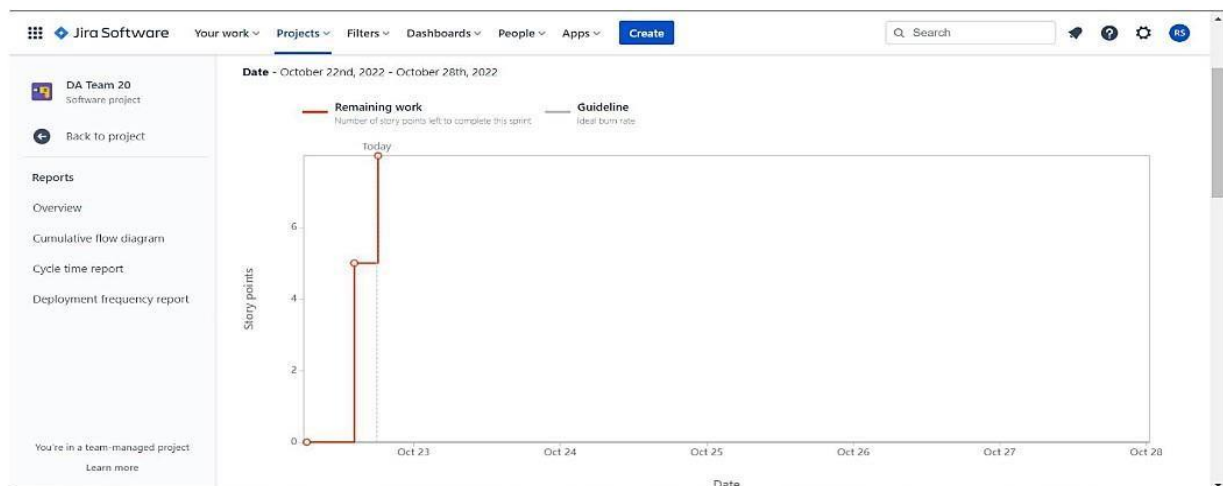
7.CODING & SOLUTIONING

7.1 FEATURE 1

1. HTML for web page making
2. CSS, js, vendor for static design content
3. Python Flask for the web server integration

7.2 FEATURE 2

1. Creating IBM cloud account
2. Accessing IBM Watson assistance for the chatbot
3. Creating saving account, Query account, Loan enquiry etc

8.TESTING

8.1 TEST CASES

8.1 Test Cases

- ✟ Verify user is able to see home page.

- ✟ Verify user is able to see Dashboard page.

- ✟ Verify user is able to navigate to Report page.

- ✟ Verify filters are working

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	10	4	2	3	20
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	11	2	4	20	37
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	5	2	1	8
Totals	24	14	13	26	77

8.2 USER ACCEPTANCE TESTING

1.Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the [ProductName] project at the time of the release to User Acceptance Testing (UAT).

2.Defect Analysis

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

3.Test Case Analysis

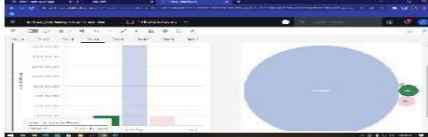This report shows the number of test cases that have passed, failed and understand

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	7	0	0	7
Client Application	51	0	0	51
Security	2	0	0	2
Outsource Shipping	3	0	0	3
Exception Reporting	9	0	0	9
Final Report Output	4	0	0	4
Version Control	2	0	0	2

9.RESULTS

9.1 PERFORMANCE METRICS

Model Performance Testing:
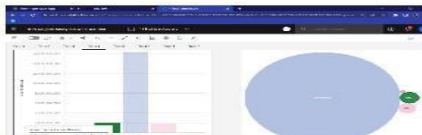
Project team shall fill the following information in model performance testing template.

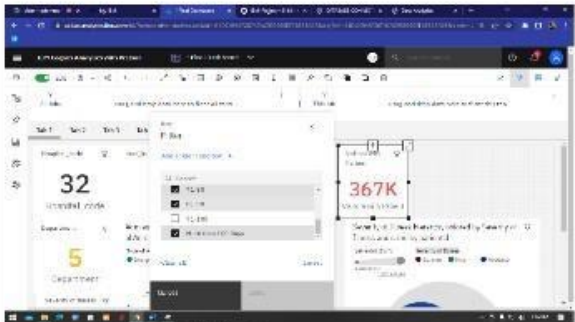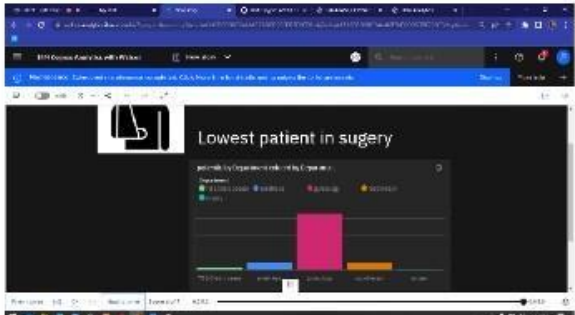| S.No.	Parameter	Screenshot/Values
1.	Dashboard design	Number of Visulizations / Graphs — 22 Number of tabs — 8
2.	Data Responsiveness	Data's will dynamically changed and graph also changed.
3.	Amount Data to Rendered (DB2 Metrics)	Number of rows read — 318438 Number of rows loaded — 318438 Number of rows rejected — D

4.	Utilization of Data Filters	We created filters for Dashboards which is perfectly working.
5.	Effective User Story	Number of Scene Added – 7 Animations are perfectly displayed. Images are perfectly rendered.
6.	Descriptive Reports	Number of Visulizations / Graphs – 6
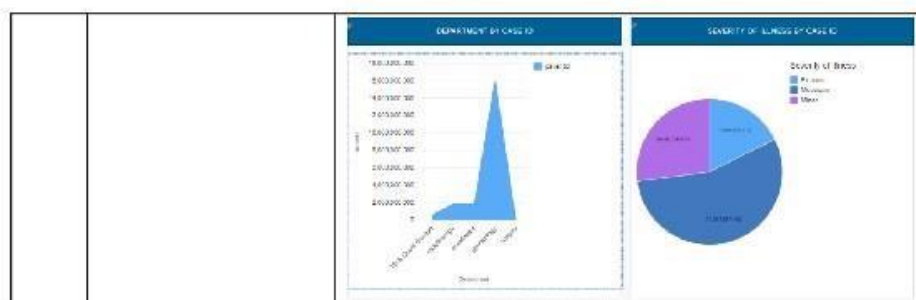
10.ADVANTAGES & DISADVANTAGES

Advantages of using chatbots in banking customer service

1. Chatbots are faster.

2. They tirelessly work round the clock and are available 24*7*365.

3. Chatbots result in huge cost savings (see the graph below).

4. Chatbots free up customer support reps time by solving basic queries, so they can concentrate on the complex ones.

5. They provide a personalized experience.

Disadvantages of using chatbots in banking customer service

1. Chatbots are as smart as they are programmed to be.

2. Handling multiple languages and dialect can be a troublesome task for chatbots.

3. Gathering data, cleaning it and training the chatbot with it is a lengthy process.

4. Chatbot lack empathy, which is considered as the backbone of the business-customer relationship.

5. They are bound to fail.

6. Reportedly, some chatbots have a low retention rate.

11 CONCLUSION

The adoption of technologies applied in the banking industry are widely studied in the literature. However, a more and more popular and frequently implemented technology, namely chatbot technology in the context of the banking industry, has received limited attention. To address this research gap, the present study was conducted with the aim of identifying the main factors that influence customers' intention to   use the   banking   chatbot technology. The proposed research model was built by adopting concepts from the TAM model, extending it with compatibility, customers' perceived privacy risk and awareness of the service. Data for the present analysis was collected from consumers via online, applying a self-administrated survey method. The findings supported the conceptual model by predicting 56.5% of variance in the behavioural intention. Perceived usefulness and perceived compatibility significantly predicted the customers intention to use the banking chatbot. Awareness of the service had an effect on perceived ease

of use, perceived privacy risk, and it indirectly affected usage intention through perceived usefulness. Also, perceived ease of use influenced perceived usefulness, and perceived compatibility had an effect on both perceived ease of use and perceived usefulness. Yet, perceived ease of use and perceived privacy risk were not found to be significant determinants of behavioural intention. As a result, the current study was able to make a significant contribution to the field for both academics and practitioners.

12.FUTURE SCOPE

The share of banks that use AI solutions and chatbots in particular is constantly rising. As another factor, the use of smartphones and other smart devices is also a rapidly growing trend. These two driving forces determine the near future of artificial intelligence assistants in the banking industry.

More and more banks tend to integrate chatbots into their mobile apps. This is a convenient way to stay in touch with their clients and, at the same time, reduce the involvement of human personnel. According to estimations calculated by Juniper Research, in 2023, chatbot interactions will save 862 million hours for banks, which equals to $7.3 billion cost savings worldwide.

13.APPENDIX

SOURCE CODE

PYTHON FLASK

```python
from flask import Flask,render_template
app=Flask(__name__)
@app.route('/')
def bank():
    return render_template('Chatbot.html')
if __name__ =='__main__':
    app.run(debug = True)
```

The popular Python frameworks used by developers for web development is Flask. In this article, you will get introduced to Python Flask framework. Along

with this, we will also see some of the basic implementations along with some HTTP methods.

WEBSITE BASED CODES

```html
F<!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="utf-8">
  <meta content="width=device-width, initial-scale=1.0" name="viewport">

  <title>Banking Bot</title>
  <meta content="" name="description">
  <meta content="" name="keywords">

  <!-- Favicons -->
  <link href="static/img/favicon.png" rel="icon">
  <link href="static/img/apple-touch-icon.png" rel="apple-touch-icon">

  <!-- Google Fonts -->
  <link
href="https://fonts.googleapis.com/css?family=Open+Sans:300,300i,400,400i,600,600i,700,700i|Raleway:
300,300i,400,400i,500,500i,600,600i,700,700i|Poppins:300,300i,400,400i,500,500i,600,600i,700,700i"
rel="stylesheet">

  <!-- Vendor CSS Files -->
  <link href="static/vendor/aos/aos.css" rel="stylesheet">
  <link href="static/vendor/bootstrap/css/bootstrap.min.css" rel="stylesheet">
  <link href="static/vendor/bootstrap-icons/bootstrap-icons.css" rel="stylesheet">
  <link href="static/vendor/boxicons/css/boxicons.min.css" rel="stylesheet">
  <link href="static/vendor/glightbox/css/glightbox.min.css" rel="stylesheet">
  <link href="static/vendor/remixicon/remixicon.css" rel="stylesheet">
  <link href="static/vendor/swiper/swiper-bundle.min.css" rel="stylesheet">

  <!-- Template Main CSS File -->
  <link href="static/css/style.css" rel="stylesheet">

</head>

<body>
  <script>
  window.watsonAssistantChatOptions = {
    integrationID: "5f8a8814-542d-4d4d-86ab-f30b90096f6c", // The ID of this integration.
    region: "us-south", // The region your integration is hosted in.
    serviceInstanceID: "23571e7e-fdd2-47af-b02a-45f7c14411ae", // The ID of your service instance.
    onLoad: function(instance) { instance.render(); }
  };
```

```
  setTimeout(function(){
    const t=document.createElement('script');
    t.src="https://web-chat.global.assistant.watson.appdomain.cloud/versions/" +
(window.watsonAssistantChatOptions.clientVersion || 'latest') + "/WatsonAssistantChatEntry.js";
    document.head.appendChild(t);
  });
</script>
 <!-- ======= Header ======= -->
 <header id="header" class="fixed-top ">
   <div class="container d-flex align-items-center justify-content-lg-between">

     <h1 class="logo me-auto me-lg-0"><a href="index.html">Bot<span>.</span></a></h1>
     <!-- Uncomment below if you prefer to use an image logo -->


     <nav id="navbar" class="navbar order-last order-lg-0">
       <ul>
         <li><a class="nav-link scrollto active" href="#home">Home</a></li>
         <li><a class="nav-link scrollto" href="#about">About</a></li>
         <li><a class="nav-link scrollto" href="#services">Services</a></li>
         <li><a class="nav-link scrollto" href="#team">Team</a></li>
         <li><a class="nav-link scrollto" href="#contact">Contact</a></li>
       </ul>
       <i class="bi bi-list mobile-nav-toggle"></i>
     </nav><!-- .navbar -->

     <a href="#about" class="get-started-btn scrollto">Get Started</a>

   </div>
 </header><!-- End Header -->

 <!-- ======= Hero Section ======= -->
 <section id="home" class="d-flex align-items-center justify-content-center">
   <div class="container" data-aos="fade-up">

     <div class="row justify-content-center" data-aos="fade-up" data-aos-delay="150">
       <div class="col-xl-6 col-lg-8">
         <h1>AI Based Discourse for Banking Industry<span>.</span></h1>
         <h2>Chatbots for banking and finance operations.</h2>
       </div>
     </div>

     <div class="row gy-4 mt-5 justify-content-center" data-aos="zoom-in" data-aos-delay="250">
       <div class="col-xl-2 col-md-4">
         <div class="icon-box">
           <i class="ri-store-line"></i>
           <h3><a href="">Loan</a></h3>
         </div>
```

```html
        </div>
        <div class="col-xl-2 col-md-4">
          <div class="icon-box">
            <i class="ri-bar-chart-box-line"></i>
            <h3><a href="">Net-Banking</a></h3>
          </div>
        </div>
        <div class="col-xl-2 col-md-4">
          <div class="icon-box">
            <i class="ri-calendar-todo-line"></i>
            <h3><a href="">24*7 </a></h3>
          </div>
        </div>
        <div class="col-xl-2 col-md-4">
          <div class="icon-box">
            <i class="ri-paint-brush-line"></i>
            <h3><a href="">Locker</a></h3>
          </div>
        </div>
        <div class="col-xl-2 col-md-4">
          <div class="icon-box">
            <i class="ri-database-2-line"></i>
            <h3><a href="">Data Security</a></h3>
          </div>
        </div>
      </div>

    </div>
  </section><!-- End Home -->


  <div id="preloader"></div>
  <a href="#" class="back-to-top d-flex align-items-center justify-content-center"><i class="bi bi-arrow-up-short"></i></a>

  <!-- Vendor JS Files -->
  <script src="static/vendor/purecounter/purecounter_vanilla.js"></script>
  <script src="static/vendor/aos/aos.js"></script>
  <script src="static/vendor/bootstrap/js/bootstrap.bundle.min.js"></script>
  <script src="static/vendor/glightbox/js/glightbox.min.js"></script>
  <script src="static/vendor/isotope-layout/isotope.pkgd.min.js"></script>
  <script src="static/vendor/swiper/swiper-bundle.min.js"></script>
  <script src="static/vendor/php-email-form/validate.js"></script>

  <!-- Template Main JS File -->
  <script src="assets/js/main.js"></script>

</body>
```

The attachments that is supported for the execution of the of this html file is upload in git repo the link is provided below.

GITHUB & PROJECT DEMO LINK:

GITHUB LINK:

IBM-EPBL/IBM-Project-51416-1660979159: AI based discourse for Banking Industry (github.com)

PROJECT DEMO LINK:

https://drive.google.com/folderview?id=13CCGW40 28R8B_JwsvjgAEYHoWMJS-fkW