

Project Report

Team ID	PNT2022TMID25178
Project Name	Customer Care Registry

1. INTRODUCTION

Project Overview:

The Customer Service Desk is a web based project. Customer Service also known as Client Service is the provision of service to customers Its significance varies by product, industry and domain. In many cases customer services is more important if the information relates to a service as opposed to a Customer. Customer Service may be provided by a Service Representatives Customer Service is normally an integral part of a company's customer value proposition. Developing a cloud application not only for solving customer complaints but also gives satisfaction to the customer to use the respective business product. This Application helps a customer to raise complaints for the issue they are facing in the products. The Customer needs to give the detailed description and the priority level of the issues that they are facing. After the complaint reviewed by the admin, then the agents assigned to the complaints raised by the customer. The respective customer of the complaints gets the email notification of the process. And additionally, they can able to see the status of the complaints.

Purpose:

An online comprehensive Customer Care Solution is to manage customer interaction and complaints with the Service Providers over phone or through and e-mail. The system should have capability to integrate with any Service Provider from any domain or industry like Banking, Telecom Insurance etc. It is also known as Client Service is the provision of service to customers Its significance varies by product industry and domain. In many cases customer services is more important if the information relates to a service as opposed to as Customer. Customer Service may be provided by a Service Representatives Customer Service is normally an integral part of a company's customer value proposition. This Application mainly developed to help the customer in processing their complaints and issues. It is a process of examining customer tickets, which should be carried out in a systematic and orderly manner. This practice is primarily aimed at minimizing consumer dissatisfaction with the purchased products, increasing service satisfaction, and ensuring quality. It allows companies to respond to customer inquiries, provides support, and improves the handling of tickets at the appointed time.

2. LITERATURE SURVEY:

Existing problem:

The existing system is a semi-automated at where the information is stored in the form of excel sheets in disk drives. The information sharing to the Volunteers, Group members, etc. is through mailing feature only. The information storage and maintenance is more critical in this system. Tracking the member's activities and progress of the work is a tedious job here. This system cannot provide the information sharing by 24x7 days. When the company pushes the wrong product or service to customer this can severely impact to company's profit, growth and brand reputation. The customer cannot track the status of the Queries that are posted by them. Some queries will be left Unanswered. To overcome this issues a good customer care should be provided to solve the customer's queries.

References:

PAPER 1:

TITLE: Automated Ticket Routing System

AUTHOR NAME: Muhammad Zikri bin Zulkifli

PUBLICATION YEAR: 2011

DESCRIPTION:

In the existing helpdesk system, the tickets were created and assigned to the end user manually. When the ticket is created, it is assigned to the agent manually before they attend that specific ticket. This manual process of ticket creation needs more manpower and takes more time. Instead of putting the effort and time into this task, the ticket creation and assigning can be done automatically when we create an Automated Ticket Routing system. The automated ticket creation and assignment process reduce the time and then the manpower can be used for other purposes. Then, by using the manual ticket creation and assignment process, the distribution of good skill sets, and workload balancing will be missed out. Finding a good skill set and assigning the tickets to the specific skilled agent automatically is considered a good job distribution. Here, the wrong agent represents the sense that the agent doesn't know well about that particular problem or issue. If the tickets are mistakenly routed, then the resources may get wasted and a lot of time will be spent unnecessarily. Using the location, skill sets, work schedule, and workload balancing, the tickets can be routed automatically to that particular agent perfectly. We can execute the above process perfectly by categorizing the tickets based on the issues.

PAPER 2:**TITLE:** Knowledge-Based Helpdesk System**AUTHOR NAME:** Mohamad Safuan Bin Sulaiman , Abdul Muin Abdul Rahman , Norzalina Bt. Nasirudin**PUBLICATION YEAR:** 2012**DESCRIPTION:**

A knowledge-Based helpdesk system is a web-based system that is used to provide technical support to an organization or to management. Then, it acts as a Service Provider to that particular organization. The main objective of this Knowledge based system is to provide technical support to the end users of a particular organization. Using this Knowledge-based Helpdesk system, an organization can improve their end user's performance and make their end users technically well educated. Once the Knowledge-based helpdesk system is designed, it is tested on the Information Technology (IT) center, Engineering Division (BKJ), etc. To have a better support solution for management, the Knowledge-based system is introduced. Usually, the Knowledge-based system consists of questions that are frequently raised by the end users. All the frequent questions are combined into categories and then, it is provided as a solution. The end users can solve their problems manually by themselves just by reading and implementing the solution that is provided. Also, the solutions that are provided by the helpdesk team can be used on future problems too. Hence, it is called a continuity and contingency process.

PAPER 3:**TITLE:** Smart Help Desk Automated Ticketing System**AUTHOR NAME:** Dhiraj Temkar, Sheetal Singh, Leema Bari, Prof.Snigdha Banga**PUBLICATION YEAR:** 2021

DESCRIPTION:

Automated technical queries help desk is proposed to possess instant real-time quick solutions and ticket categorization. Incorrect routing of tickets to the incorrect resolver group causes delays in resolving the matter. It also causes unnecessary resource utilization, and customer dissatisfaction and affects the business. To beat these problems, the proposed "Smart Automated Ticketing System" supports supervised machine learning techniques that automatically predict the category of the ticket using the natural language ticket description entered by the user through a chat interface. It also helps in faster resolution of customer issues and sends them an email about the status of the ticket. This process assures customer satisfaction and also keeps the customers within the loop.

PAPER 4:

TITLE: Theory and Practice of Customer-related Improvements

AUTHOR NAME: Daniel Gyllenhammar, et al

PUBLICATION YEAR: 2022

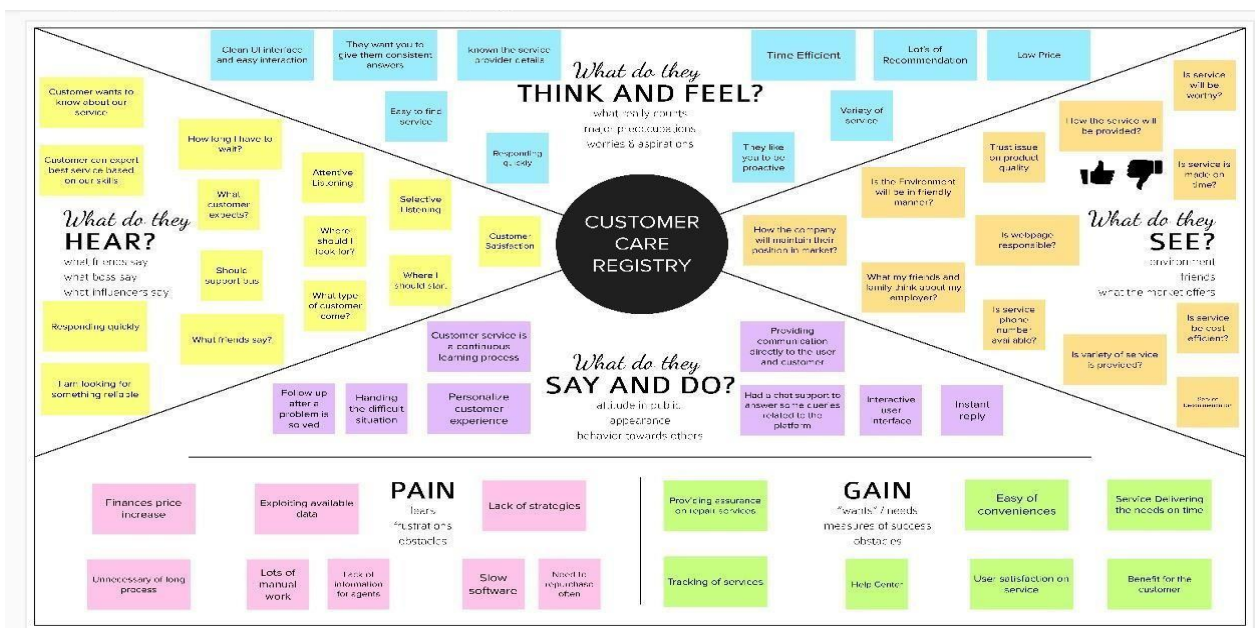
DESCRIPTION:

In an organization, the Information Technology (IT) support help desk operation is an important unit that handles the IT services of a business. Many large-scale organizations handle engagement and requests with employees on a 24×7 basis. As with any routine tasks, most processes of the support help desk unit are considered repetitive in nature repetitive tasks such as entering information into an application, resetting passwords, unlocking applications, and credentials errors. The industry has now come to realize that many repetitive business processes and tasks can be automated by using Robotic Process Automation (RPA) bots or robotic processes automotive software bots. The idea is to take the repetitive workload and hand it over to the RPA bots so that the employees could focus on more value-adding tasks and decision-making for the organization. The RPA bot would also help to reduce human errors and make processes more efficient, which would finally result in cost savings and productivity increase.

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	User	Ticket Bookin g	Time Delay	Agent Not Responding	Sad
PS-2	User(Agent)	Solve Proble m	Customer Not Responding	Customer Unavailable	Frustrated
PS-3	User(Admin)	Backup Data	Data Loss	System Failure	Anxiety
PS-4	User	Looking forStatus	Status Unavailable	Agent Not Updated	Stressed

3.IDEATION & PROPOSED SOLUTION

Empathy Map Canvas



Ideation & Brainstorming

Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

- 10 minutes to prepare
- 10 minutes to collaborate
- 20 minutes to present

Before you collaborate:

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

- 10 minutes

- Test gathering: Design ideas to get ideas in the session can be done on their own or in small groups.
- Start the game: There are a few problem sets to be tested or solved in the brainstorming session.
- Learn how to use the facilitation tools: Our facilitation tools are designed to help you and your team.

Open article

Define your problem statement

What problem are you trying to solve? Frame your problem as a clear, specific statement. This will be the focus of your brainstorm.

5 minutes

Problem:

"To overcome the existing defects for returning products because of cracks, complaints etc., through feedback message in the app."

Key rules of brainstorming

Focus on quantity and produce ideas.

- Don't judge
- Encourage wild ideas
- Deferral of judgment
- Let others go first
- One idea at a time
- It's possible, no matter

Brainstorm

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

10 minutes

Sabari

1. Idea	2. Idea	3. Idea	4. Idea
5. Idea	6. Idea	7. Idea	8. Idea
9. Idea	10. Idea	11. Idea	12. Idea
13. Idea	14. Idea	15. Idea	16. Idea

Lokeshwar

1. Idea	2. Idea	3. Idea	4. Idea
5. Idea	6. Idea	7. Idea	8. Idea
9. Idea	10. Idea	11. Idea	12. Idea
13. Idea	14. Idea	15. Idea	16. Idea

Shanmugam

1. Idea	2. Idea	3. Idea	4. Idea
5. Idea	6. Idea	7. Idea	8. Idea
9. Idea	10. Idea	11. Idea	12. Idea
13. Idea	14. Idea	15. Idea	16. Idea

Suriyakumar

1. Idea	2. Idea	3. Idea	4. Idea
5. Idea	6. Idea	7. Idea	8. Idea
9. Idea	10. Idea	11. Idea	12. Idea
13. Idea	14. Idea	15. Idea	16. Idea

Share template feedback

4 Prioritize

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

20 minutes

Importance

If an idea is important, it could go on the grid. If an idea is not important, it could go on the grid. If an idea is not important, it could go on the grid.

Feasibility

Feasibility is the ability to do something. It is the ability to do something. It is the ability to do something.

TIP

Participants use their own ideas to place ideas on the grid. The facilitator can confirm this by using the board game: 'Boarding the ship on the board.'

After you collaborate

You can export the mural as an image or pdf to share with members of your company who might find it helpful.

Quick add-ons

- Share the mural**
Share a view link to the mural with stakeholders to keep them in the loop about the outcomes of the session.
- Export the mural**
Export a copy of the mural as a PNG or PDF or attach it to an email, include it in a slide, or save it in your drive.

Keep moving forward

- Strategy blueprint**
Define the components of a new idea or strategy.
[Open the template](#)
- Customer experience journey map**
Understand customer needs, motivations, and observations for any opportunities.
[Open the template](#)
- Strengths, weaknesses, opportunities & threats**
Identify strengths, weaknesses, opportunities, and threats (SWOT) to develop a plan.
[Open the template](#)

[Share template feedback](#)

Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	To solve customer issues using Cloud Application Development.
2.	Idea / Solution description	Assigned Agent routing can be solved by directly routing to the specific agent about the issue using the specific Email. Automated Ticket closure by using daily sync of the daily database. Status Shown to the Customer can display the status of the ticket to the customer. Regular data retrieval in the form of retrieving lost data.
3.	Novelty / Uniqueness	Assigned Agent Routing, Automated Ticket Closure, Status Shown to the Customer, and Backup data in case of failures.
4.	Social Impact / Customer Satisfaction	Customer Satisfaction, Customer can track their status and Easy agent communication.
5.	Business Model (Revenue Model)	<ul style="list-style-type: none"> ● Key Partners - Third-party applications, agents, and customers. ● Activities - Customer Service, System Maintenance. ● Key Resources - Engineers, Multi-channel. ● Customer Relationship - 24/7 Email Support, Knowledge-based channel. ● Cost Structure - Cloud Platform, Offices.
6.	Scalability of the Solution	All customers are prioritized based on SLA (Service Level Agreement) - Urgent, Moderate, Low.

Problem Solution fit

Problem-Solution fit canvas 2.0

<p>1. CUSTOMER SEGMENT(S) CS</p> <p>Which your customer?</p> <p>1) Customers who are not able to solve them Own complaints of what they are facing. 2) Customers who do not know the solution of their questions they get.</p>	<p>6. CUSTOMER CC</p> <p>What constraints prevent your customers from <u>accessing</u> or limit their choices of solutions? <u>spending power, budget, no cash, network connection, available devices.</u></p> <p>1) This application will be supported by almost all the devices. 2) The solution we propose will have an alert via email feature, if expense exceed the given limit. 3) This solution also provides insights in a graphical way.</p>	<p>5. AVAILABLE SOLUTIONS AS</p> <p>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 price & some do these solutions have? <u>net and paper is an alternative to digital networking</u></p> <p>1) By reading the guidelines properly. 2) Offer a solution and give options whenever possible. 3) Address to issue within the company. 4) By communicating properly</p>	Explore AS.
<p>2. JOBS-TO-BE-DONE / PROBLEMS J&P</p> <p>Which job-to-be-done (or problem) do you address for your customers? There could be more than one, explore different sides.</p> <p>1) The application <u>allow</u> the customers to find the solution for their queries. 2) They <u>will</u> be able to categorize their expenses. 3) They will be also given option for the general <u>questions</u>. 4) They also get the free solution where we provide our agents.</p>	<p>9. PROBLEM ROOT CAUSE RC</p> <p>What is the real reason that this problem exists? What is the back story behind the need to do this job? <u>customers have to do it because of the change in regulations.</u></p> <p>1) Lot of customers don't know the guidelines for their problems. 2) Some customers have of lack of <u>knowledge</u>. 3) Not knowing the answer to a question. 4) Not reading the guidelines properly</p>	<p>7. BEHAVIOUR BE</p> <p>What does your customer do to address the problem and get the job done? <u>directly related</u> find the right solution/answer, calculate usage and benefit; <u>indirectly associated</u> customers spend less time on volunteering work (i.e. Government)</p> <p>1) Make sure he/she reads the guidelines properly. 2) Make sure they find a proper solution <u>for</u> their queries.</p>	Focus on J&P, tap into RC, understand
<p>3. TRIGGERS TR</p> <p>What triggers customers to act? <u>seeing their <u>quotation</u> (including solar panels, reading about a more efficient solution in the news).</u></p> <p>1) Customers can know to solve their solutions.</p> <p>4. EMOTIONS: BEFORE / AFTER EM</p> <p>How do customers feel when they face a problem or a job and afterwards? <u>first, insecure -> confident, in control - use it in your communication strategy & design.</u></p> <p>1) Customers can get the from the help desk.</p>	<p>10. YOUR SOLUTION SL</p> <p>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 <u>behaviour</u>.</p> <p>1) To design a personal help desk using flask. 2) To provide insights on their queries in a graphical way.</p>	<p>8. CHANNELS of BEHAVIOUR CH</p> <p>8.1 ONLINE: What kind of actions do customers take online? Extract online channels from #7</p> <p>1) All their data are secured and being updated to cloud storage</p> <p>8.2 OFFLINE: What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.</p> <p>1) Make sure they find the best solutions for their complaints.</p>	Extract online & offline CH of BE

4.REQUIREMENT ANALYSIS

Functional requirement

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Admin/Agent Registration	Registration through Gmail.
FR-2	Admin/Agent Confirmation	Confirmation via Email.
FR-3	Customer Query	Access through Email, Chatbot from targeted websites.
FR-4	Customer Confirmation	Confirmation through Ticket ID in Email.
FR-5	Database	Storing the object model.

Non-Functional requirements

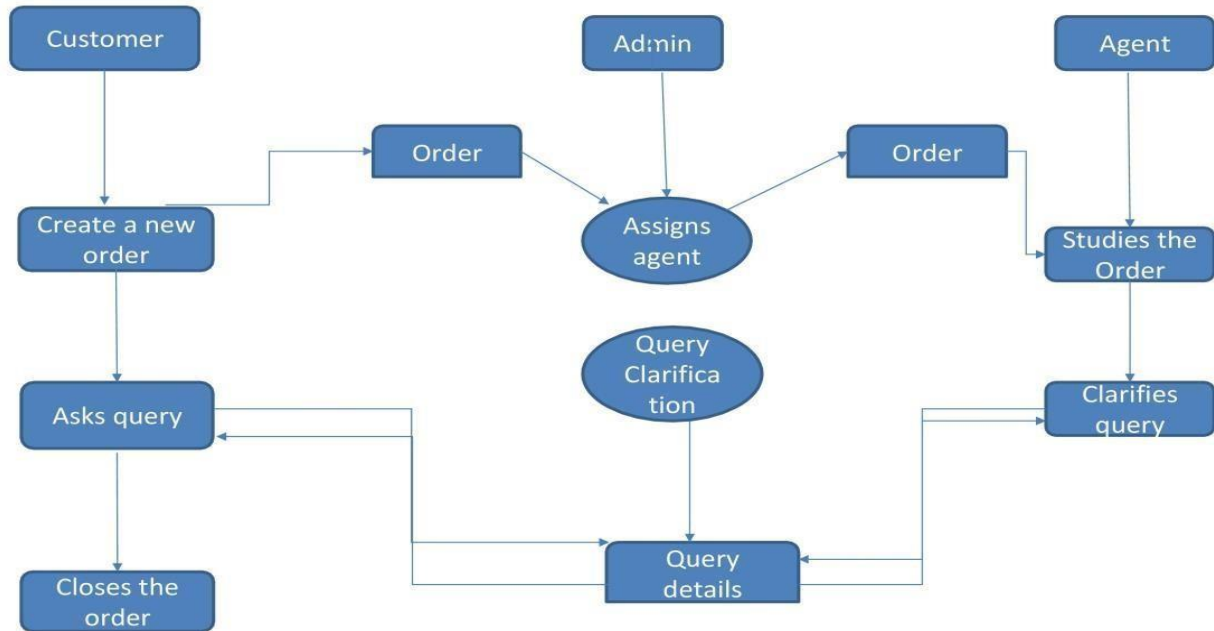
Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	User Friendly, Easily Accessible.
NFR-2	Security	IBM Digital Security Certificate(SSL) for Database.
NFR-3	Reliability	Providing Quality Content.
NFR-4	Performance	Quick Access, Flexible, and Responsive
NFR-5	Availability	24/7 Support
NFR-6	Scalability	Good performance for large Customers and workload

5.PROJECT DESIGN

Data Flow Diagrams

Data flow diagram for Customer care Registry



Solution & Technical Architecture:

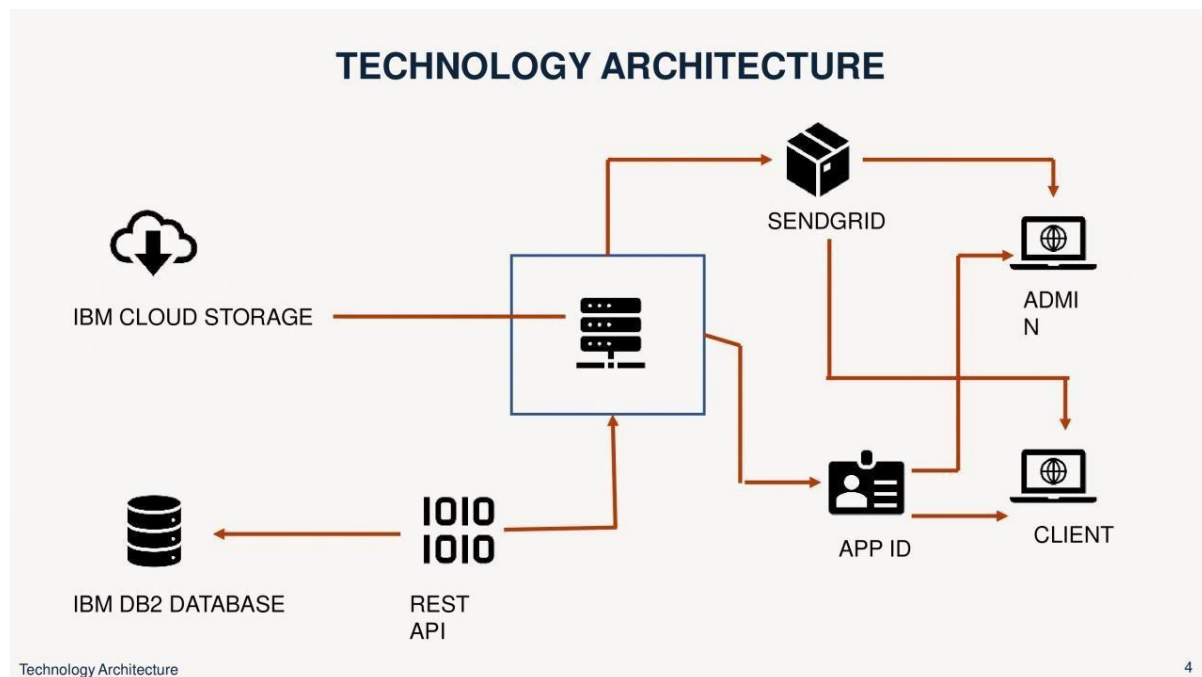


Table-1: Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Similarly Like Chatbot, Web UI and etc...	HTML, CSS, JavaScript, Json, JQuery
2.	Application Logic-1	It helps to perform the Entire Functions and Tasks in the Application.	Python
3.	Application Logic-2	Providing the Virtual Assistant for Customer Queries	IBM Watson Assistant
4.	Database	Data from config. json is used to configure virtual machine. After that JSON syntax is invalid.	JSON
5.	Cloud Database	Database Service on Cloud	IBM DB2
6.	File Storage	File storage requirements	IBM Block Storage and Object Storage
7.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Local Server Cloud Server Configuration : Online Server	Docker and Kubernetes

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Flask-Python Framework	Flask -Python
2.	Security Implementations	Digital Certificate SSL Security	IBM Cloud and IBM DB2
3.	Scalable Architecture	Sendgrid API and Json Server	IBM Object Storage
4.	Availability	Large Number of Customer Utilize	IBM Kubernetes
5.	Performance	Fast Recovering Data From IBM DB2 and flexible request and response from Cloud	IBM Cloud

User Stories

Use the below template to list all the user stories for the product.

User Stories

Use the below template to list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a customer, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
	login	USN-2	As a customer, I can login to the application by entering correct email and password.	I can access my account/dashboard.	High	Sprint-1
	Dashboard	USN-3	As a customer, I can see all the orders raised by me.	I get all the info needed in my dashboard.	Low	Sprint-2
	Order creation	USN-4	As a customer, I can place my order with the detailed description of my query	I can ask my query	Medium	Sprint-2
	Address Column	USN-5	As a customer, I can have conversations with the assigned agent and get my queries clarified	My queries are clarified.	High	Sprint-3
	Forgot password	USN-6	As a customer, I can reset my password by this option incase I forgot my old password.	I get access to my account again	Medium	Sprint-4
Agent (web user)	Order details	USN-7	As a Customer ,I can see the current stats of order.	I get abetter understanding	Medium	Sprint-4
	Login	USN-1	As an agent I can login to the application by entering Correct email and password.	I can access my account / dashboard.	High	Sprint-3
	Dashboard	USN-2	As an agent, I can see the order details assigned to me by admin.	I can see the tickets to which I could answer.	High	Sprint-3
	Address column	USN-3	As an agent, I get to have conversations with the customer and clear his/er dobuts	I can clarify the issues.	High	Sprint-3
	Forgot password	USN-4	As an agent I can reset my password by this option in case I forgot my old password.	I get access to my account again.	Medium	Sprint-4

Admin (Mobile user)	Login	USN-1	As a admin, I can login to the appliaction by entering Correct email and password	I can access my account/dashboard	High	Sprint-1
	Dashboard	USN-2	As an admin I can see all the orders raised in the entire system and lot more	I can assign agents by seeing those order.	High	Sprint-1
	Agent creation	USN-3	As an admin I can create an agent for clarifying the customers queries	I can create agents.	High	Sprint-2
	Assignment agent	USN-4	As an admin I can assign an agent for each order created by the customer.	Enable agent to clarify the queries.	High	Sprint-1
	Forgot password	USN-5	As an admin I can reset my password by this option in case I forgot my old password.	I get access to my account.	High	Sprint-1

6. PROJECT PLANNING & SCHEDULING

Sprint Planning & Estimation

TITLE	DESCRIPTION	DATE
Literature Survey & Information Gathering	Literature survey on the selected project & gathering information by referring to technical papers, research publications etc.	19 November 2022
Prepare Empathy Map	Prepare Empathy Map Canvas to capture the user Pains & Gains, Prepare list of problem statements	19 November 2022
Ideation	List them by organizing the brainstorming session and prioritize the top 3 ideas based on feasibility & importance.	19 November 2022
Proposed Solution	Prepare the proposed solution document, which includes the novelty, feasibility of idea, business model, social impact, scalability of solution, etc.	20 November 2022
Problem Solution Fit	Prepare problem - solution fit document.	20 November 2022
Solution Architecture	Prepare a solution architecture document.	20 November 2022

Customer Journey	Prepare the customer journey maps to understand the user interactions & experiences with the application (entry to exit).	20 November 2022
Functional Requirement	Prepare the functional requirement document.	20 November 2022
Data Flow Diagrams	Draw the data flow diagrams and submit for review.	20 November 2022
Technology Architecture	Prepare the technology architecture diagram.	21 November 2022
Prepare Milestone & Activity List	Prepare the milestones & activity list of the project.	21 November 2022
Project Development - Delivery of Sprint-1, 2, 3 & 4	Develop & submit the developed code by testing it.	24 November 2022 (PLANNED)

Product Backlog, Sprint Schedule, and Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Customer Panel	USN-1	As a Customer, I can register for the application by entering my email, password, and confirming my password and I will be able to Access my dashboard for creating a Query Order.	2	High	Sanjai Monesh Kumar Sabarish
Sprint-1	Admin Panel	USN-2	As an admin, I can Login to the Application by entering correct login credentials and I will be able to Access My dashboard to create Agents and Assign an Agent to a Query Order.	2	High	Sanjai Monesh Kumar Punith
Sprint-2	Agent Panel	USN-3	As an agent, I can Login to the Application by entering correct login credentials and I will be able to Access my Dashboard to check the Query Order and I can Clarify the Issues.	2	High	Punith Sanjai Sabarish T

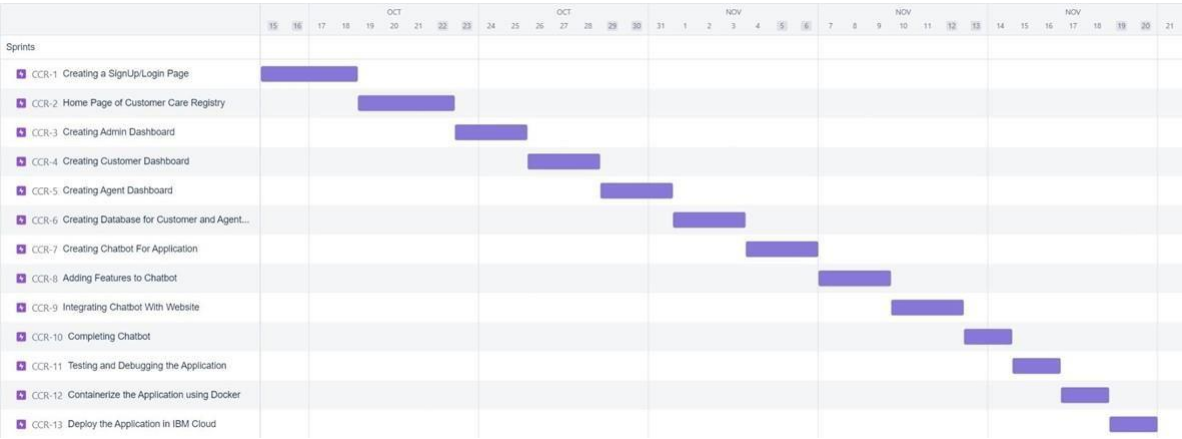
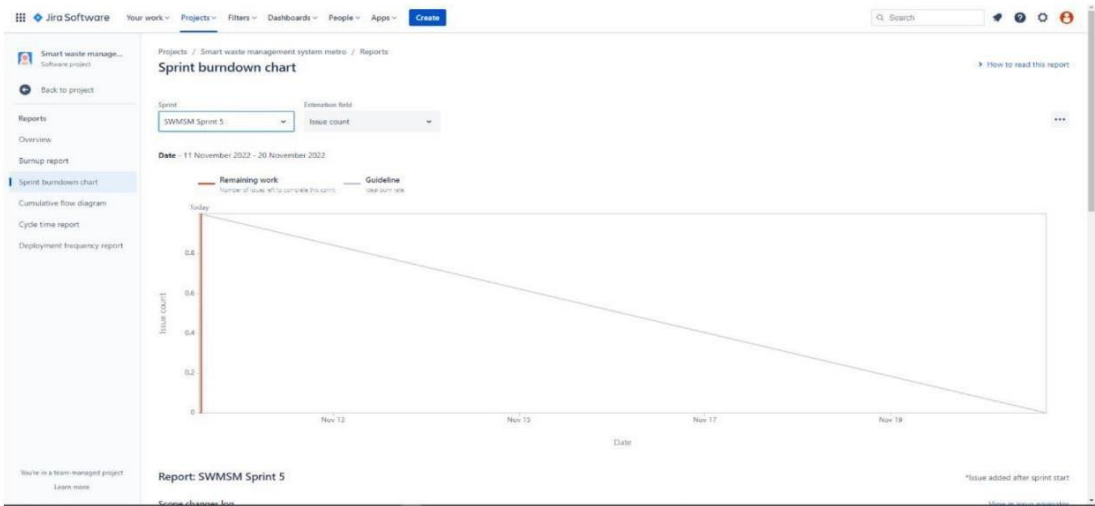
Sprint-3	Chat Bot	USN-4	The Customer can directly Interact to the Chatbot regarding the services offered by the Web Portal and get recommendations based on information provided by them.	2	Medium	Sanjai Punith Monesh Kumar
Sprint-4	Final Delivery	USN-5	Container of applications using docker kubernetes and deployment the application. Create the documentation and finalsubmit the application	2	High	Sanjai Punith Monesh Kumar Sabarish

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	7 Days	19 Nov 2022	19 Nov 2022		19 Nov 2022
Sprint-2	20	7 Days	20 Nov 2022	20 Nov 2022		20 Nov 2022
Sprint-3	20	8 Days	22 Nov 2022	22 Nov 2022		22 Nov 2022
Sprint-4	20	7 Days	24 Nov 2022	24 Nov 2022		24 Nov 2022

6.3 Reports from JIRA

BURNDOWN CHART



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

College graduates with prior programming expertise or technical degrees are recruited and transitioned into professional positions with Alabama firms and organizations through the highly competitive Coding Solutions job accelerator and talent refinement programme at no cost to the graduates. We provide a pool of varied, well-trained, tech-savvy individuals that wants to launch and advance their career in Alabama.

The mission of veteran- and woman-owned Coding Solutions is to mobilize the next generation of IT talent and provide them the tools and resources they require to make your business successful. Innovative talent is necessary for innovative technologies. We wish to provide Coding Solutions prospects to assist you expand your Alabama team.

Our applicants are swiftly hired at the top of the list by growing businesses for lucrative, long-term positions.

Feature 1

7 Main types of customer needs:

- User-friendly
- Empathy
- Fairness
- Control
- Alternatives
- Information

Features

- Complaint Tracking
- Email Alert
- 24/7 Monitoring

User Acceptance Testing

Purpose of Document

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

Defect Analysis

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

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	10	3	1	2	17
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	11	2	4	20	40
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	5	2	1	8
Totals	24	13	12	25	78

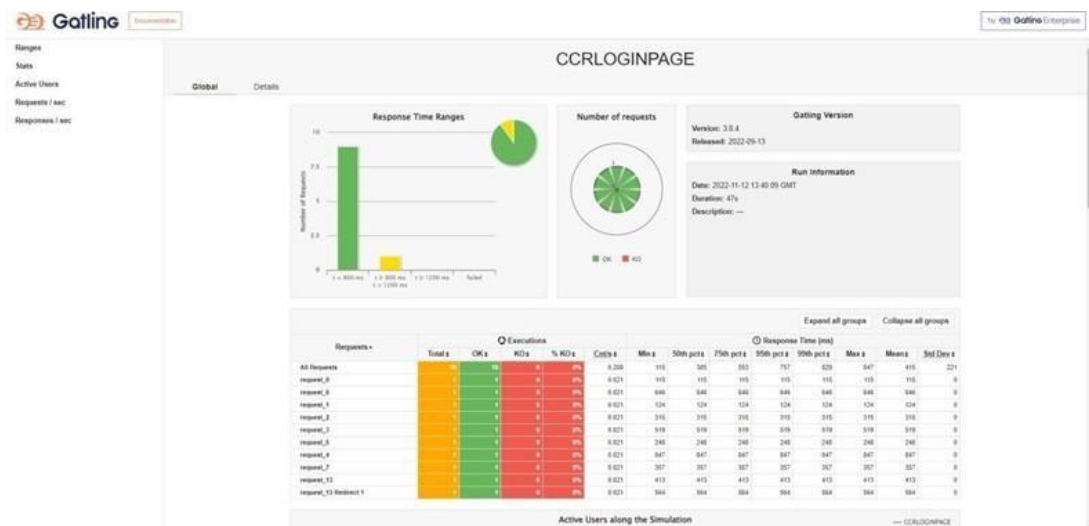
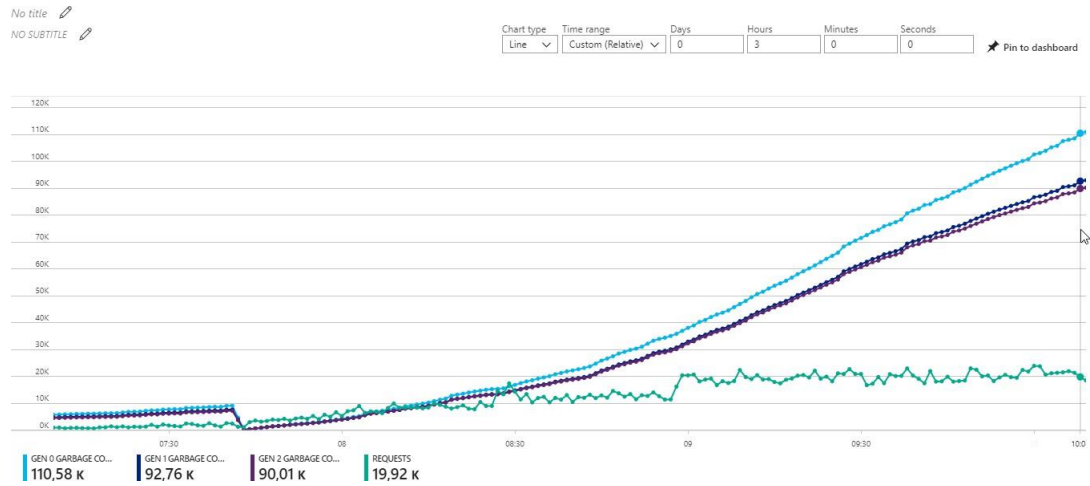
Test Case Analysis

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

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	10	0	0	10
Client Application	50	0	0	50
Security	1	0	0	1
Outsource Shipping	3	0	0	3
Exception Reporting	8	0	0	8
Final Report Output	4	0	0	4
Version Control	2	0	0	2

9.RESULTS

Performance Metrics



10. ADVANTAGES & DISADVANTAGES

ADVANTAGES:

- It retains the customer
- Gets you more references
- Increases profitability
- Gives you and your employees confidence
- Creates a holistic marketing scenario
- Competitive advantage
- Boost Customer Loyalty
- Enhance Brand Reputation
- Improve Products, Services, Procedures and Staff

DISADVANTAGES:

- Higher staff wages from hiring employees who are experts in customer service.
- Paying for staff training
- The extra services offered, such as refreshments
- Higher wage costs from the extra time staff take to provide post-sales service.
- It can be particularly difficult for small businesses to cope with these costs

11. CONCLUSION

In conclusion, customer care, involves the use of basic ethics and any company who wants to have success and grow, needs to remember, that in order to do so, it must begin with establishing a code of ethics in regards to how each employee is to handle the dealing with customers. Customers are at the heart of the company and its growth or decline. Customer care involves, the treatment, care, loyalty, trust the employee should extend to the consumer, as well in life.

12. FUTURE SCOPE

Machine learning (ML), emerging customer service trends 2022 can help businesses in improving overall CX. Chat applications powered by AI are trending. Large companies, as well as startups, are leveraging this to reduce costs and improve service for customers.

Predictive analytics has particularly proved to be very useful. Through this, quarries that will result in a call for assistance can be predicted easily. Implementing ML in customer service trends will give you a significant difference in business growth.

13. APPENDIX

Source Code

```
# Project : Customer Care Registry  
# Team ID : PNT2022TMID48470
```

index.py

```
from flask import Flask, render_template, request, redirect, url_for, session, flash, jsonify  
from flask_mysql_db import MySQL  
import MySQLdb.cursors  
import ibm_db  
import re, random, smtplib, os, time, datetime  
from flask_mail import Mail, Message  
  
app = Flask(__name_)  
  
app.secret_key = '12345'  
  
conn = ibm_db.connect("DATABASE=bludb;HOSTNAME=21fecfd8-47b7-4937-840d-  
d791d0218660.bs2io90l08kqb1od8lpg.databases.appdomain.cloud;PORT=31864;SECURITY=SSL;  
SSLServerCertificate=DigiCertGlobalRootCA.crt;UID=rtp84701;PWD=DJ4gX1wChdTCGZPz", "", "")  
  
mail = Mail(app)  
  
app.config['MAIL_SERVER'] = 'smtp.gmail.com'  
app.config['MAIL_PORT'] = 465  
app.config['MAIL_USERNAME'] = 'customer-careregistry22@gmail.com'  
app.config['MAIL_PASSWORD'] = 'vxzttcjvdrqeeve'  
app.config['MAIL_USE_TLS'] = False  
app.config['MAIL_USE_SSL'] = True  
mail = Mail(app)  
  
@app.route('/', methods = ['GET', 'POST'])  
def index():  
    if request.method == 'POST' and 'email' in request.form:  
        email = request.form['email']  
        cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)  
        cursor.execute('SELECT * FROM subscriptions WHERE email = % s', (email, ))  
        subscriptions = cursor.fetchone()  
        if subscriptions:  
            flash('This Email Is Already Subscribed')  
        else:
```

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```
ts = time.time()
timestamp = datetime.datetime.fromtimestamp(ts).strftime('%Y-%m-%d %H:%M:%S')
cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)
cursor.execute('INSERT INTO subscriptions VALUES (%s, %s, %s)', (None, email, timestamp, ))
mysql.connection.commit()
flash('You have successfully Subscribed')
return render_template('index.html')
```

```
@app.route('/customerlogin', methods=['GET', 'POST'])
def customerlogin():
    msgdecline = ""
    if request.method == 'POST' and 'cemail' in request.form and 'cpassword' in request.form:
        cemail = request.form['cemail']
        cpassword = request.form['cpassword']
        cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)
        cursor.execute('SELECT * FROM customers_details WHERE customer_email = %s AND
customer_password = %s', (cemail, cpassword, ))
        customers_details = cursor.fetchone()
        if customers_details:
            session['loggedin'] = True
            session['cemail'] = customers_details['customer_email']
            msgsuccess = 'Logged in successfully !'
            return redirect(url_for('welcome'))
        else:
            msgdecline = 'Incorrect Email / Password !'
    return render_template('customerlogin.html', msgdecline = msgdecline)
```

```
@app.route('/agentlogin', methods=['GET', 'POST'])
def agentlogin():
    msgdecline = ""
    if request.method == 'POST' and 'aemail' in request.form and 'apassword' in request.form:
        aemail = request.form['aemail']
        apassword = request.form['apassword']
        cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)
        cursor.execute('SELECT * FROM agent_information WHERE agent_email = %s AND agent_password
= %s', (aemail, apassword, ))
        agent_information = cursor.fetchone()
        if agent_information:
            session['loggedin'] = True
            session['aemail'] = agent_information['agent_email']
            msgsuccess = 'Logged in successfully !'
            return redirect(url_for('agentdashboard'))
```

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else:

msgdecline = 'Incorrect Email / Password !'

return render_template('agentlogin.html', msgdecline = msgdecline)

@app.route('/adminlogin', methods =['GET', 'POST'])

def adminlogin():

msgdecline = "

if request.method == 'POST' and 'adminusername' in request.form and 'adminpassword' in request.form:

adminusername = request.form['adminusername']

adminpassword = request.form['adminpassword']

cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)

cursor.execute('SELECT * FROM admin_details WHERE admin_username = % s AND admin_password
= % s', (adminusername, adminpassword,))

admin = cursor.fetchone()

if admin:

session['loggedin'] = True

session['adminusername'] = admin['admin_username']

msgsuccess = 'Logged in successfully !'

return redirect(url_for('admindashboard'))

else:

msgdecline = 'Incorrect Username / Password !'

return render_template('adminlogin.html', msgdecline = msgdecline)

@app.route('/customerregister', methods =['GET', 'POST'])

def customerregister():

msgdecline = "

if request.method == 'POST' and 'cname' in request.form and 'cemail' in request.form and 'cpassword' in
request.form and 'cconfirmpassword' in request.form :

cname = request.form['cname']

cemail = request.form['cemail']

cpassword = request.form['cpassword']

cconfirmpassword = request.form['cconfirmpassword']

cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)

cursor.execute('SELECT * FROM customers_details WHERE customer_email = % s', (cemail,))

user_registration = cursor.fetchone()

if user_registration:

msgdecline = 'Account already exists ! Try Login'

elif cpassword != cconfirmpassword:

msgdecline = 'Password did not match !'

else:

ts = time.time()

timestamp = datetime.datetime.fromtimestamp(ts).strftime('%Y-%m-%d %H:%M:%S')

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```
cursor.execute('INSERT INTO customers_details VALUES (%s, % s, % s, % s, % s)', (None, cname,
cemail, cpassword, timestamp, ))
mysql.connection.commit()
flash('You have successfully registered ! Try Login')
try:
    mailmsg = Message('Customer Care Registry', sender = 'Registration Successful', recipients = ['{ }',
cemail])
    mailmsg.body = "Hello { },\nYou have successfully registered on Customer Care
Registry".format(cname)
    mail.send(mailmsg)
except:
    pass
return redirect(url_for('customerlogin'))
elif request.method == 'POST':
    msgdecline = 'Please fill out the form !'
return render_template('customerregister.html', msgdecline = msgdecline)
```

```
@app.route('/agentregister', methods =['GET', 'POST'])
def agentregister():
    if not session.get("adminusername"):
        return redirect("/adminlogin")
    else:
        msgdecline = "
        if request.method == 'POST' and 'aname' in request.form and 'aemail' in request.form and 'ausername' in
request.form and 'apassword' in request.form and 'aconfirmpassword' in request.form :
            aname = request.form['aname']
            aemail = request.form['aemail']
            ausername = request.form['ausername']
            apassword = request.form['apassword']
            aconfirmpassword = request.form['aconfirmpassword']
            cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)
            cursor.execute('SELECT * FROM agent_information WHERE agent_email = % s', (aemail, ))
            agent_information = cursor.fetchone()
            if agent_information:
                msgdecline = 'Account already exists ! Try Login'
            else:
                ts = time.time()
                timestamp = datetime.datetime.fromtimestamp(ts).strftime('%Y-%m-%d %H:%M:%S')
                cursor.execute('INSERT INTO agent_information VALUES (%s, % s, % s, % s, % s, % s)', (None,
aname, aemail, ausername, apassword, timestamp,))
                mysql.connection.commit()
                flash('Agent Has been successfully registered !')
            try:
```


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```
mailmsg = Message('Customer Care Registry', sender = 'Registration Successful', recipients = ['{}',
aemail])
mailmsg.body = "Hello, You have been Successfully Registered as Agent"
mail.send(mailmsg)
except:
    pass
    return redirect(url_for('agentlogin'))
elif request.method == 'POST':
    msg = 'Please fill out the form !'
    return render_template('agentregister.html', msgdecline = msgdecline)
```

```
@app.route('/welcome', methods =['GET', 'POST'])
def welcome():
    if not session.get("cemail"):
        return redirect("/customerlogin")
    else:
        msgsuccess = "
        msgdecline = "
        cmail = session['cemail']
        mycursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)
        mycursor.execute('SELECT * FROM complaint_details WHERE customer_email = %s ORDER BY
timestamp DESC', (cmail,))
        data = mycursor.fetchall()
        mycursor.execute('SELECT customer_name FROM customers_details WHERE customer_email = %s',
(cmail,))
        cname = mycursor.fetchone()
        if request.method == 'POST' and 'name' in request.form and 'email' in request.form and 'category' in
request.form and 'subject' in request.form and 'description' in request.form :
            name = request.form['name']
            email = request.form['email']
            category = request.form['category']
            subject = request.form['subject']
            description = request.form['description']
            ticketno = random.randint(100000, 999999)
            ts = time.time()
            timestamp = datetime.datetime.fromtimestamp(ts).strftime('%Y-%m-%d %H:%M:%S')
            cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)
            cursor.execute('INSERT INTO complaint_details VALUES (%s, % s, % s, % s, % s, % s, % s, % s, %
s)', (ticketno, name, email, category, subject, description, timestamp , "pending" , "pending" , ))
            mysql.connection.commit()
            try:
                mailmsg = Message('Customer Care Registry', sender = 'Request Received', recipients = ['{}', email])
                mailmsg.body = "Hello {},\n\nThanks for contacting Customer Care Registry\nWe have received your
complain\nYour Ticket Number: {}\nCategory: {}\nSubject: {}\nDescription: {}\n\nWe strive to provide
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excellent service, and will respond to your request as soon as possible.".format(name, ticketno, category, subject, description)

mail.send(mailmsg)

except:

pass

flash('Your complaint is successfully submitted !')

return redirect(url_for('welcome'))

elif request.method == 'POST':

msgdecline = 'Please fill out the form !'

return render_template('welcome.html', msgsuccess = msgsuccess, data=data, cname=cname)

@app.route('/agentdashboard', methods =['GET', 'POST'])

def agentdashboard():

if not session.get("aemail"):

return redirect("/agentlogin")

else:

msg = "

aemail = session['aemail']

mycursor1 = mysql.connection.cursor(MySQLdb.cursors.DictCursor)

mycursor1.execute('SELECT agent_name FROM agent_information WHERE agent_email = %s',
(aemail,))

agent = mycursor1.fetchone()

for x in agent:

agent_name = agent[x]

mycursor2 = mysql.connection.cursor(MySQLdb.cursors.DictCursor)

mycursor2.execute('SELECT * FROM complaint_details WHERE agent_name = %s ORDER BY
timestamp DESC', (agent_name,))

data = mycursor2.fetchall()

if request.method == 'POST' and 'status' in request.form :

status = request.form['status']

ticketno = request.form['ticketno']

cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)

cursor.execute('UPDATE complaint_details SET status = %s WHERE ticket_no = %s', (status,
ticketno,))

mysql.connection.commit()

msg = 'Your complaint is successfully solved !'

mailcursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)

mailcursor.execute('SELECT customer_email FROM complaint_details WHERE ticket_no = %s',
(ticketno,))

customer_mail = mailcursor.fetchone()

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```
for x in customer_mail:
    cemail = customer_mail[x]

    try:
        mailmsg = Message('Customer Care Registry', sender = 'Your Ticket Status', recipients = ['{}',
cemail])
        mailmsg.body = "Hello, \nYour complaint has been successfully solved\nYour Ticket Number:
{}".format(ticketno)
        mail.send(mailmsg)
    except:
        pass
    return redirect(url_for('agentdashboard'))
elif request.method == 'POST':
    msg = 'Please fill out the form !'
return render_template('agentdashboard.html', msg = msg, data=data, agent_name=agent_name)
```

```
@app.route('/admindashboard', methods =['GET', 'POST'])
def admindashboard():
    if not session.get("adminusername"):
        return redirect("/adminlogin")
    else:
        msg = "
mycursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)
mycursor.execute('SELECT * FROM complaint_details ORDER BY timestamp DESC')
data = mycursor.fetchall()
mycursor.execute('SELECT * FROM agent_information')
agent = mycursor.fetchall()
mycursor.execute('SELECT COUNT(status) AS pending FROM complaint_details WHERE status = %s',
("pending",))
pending = mycursor.fetchall()
mycursor.execute('SELECT COUNT(status) AS assigned FROM complaint_details WHERE status =
%s', ("Agent Assigned",))
assigned = mycursor.fetchall()
mycursor.execute('SELECT COUNT(status) AS completed FROM complaint_details WHERE status =
%s', ("Closed",))
completed = mycursor.fetchall()
if request.method == 'POST' and 'agentassign' in request.form :
    agentassign = request.form['agentassign']
    adminusername = request.form['adminusername']
    ticketno = request.form['ticketno']
    cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)
    cursor.execute('UPDATE complaint_details SET agent_name = %s WHERE ticket_no = %s',
(agentassign, ticketno,)) )
```

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```
cursor.execute('UPDATE complaint_details SET status = %s WHERE ticket_no = %s', ('Agent
Assigned', ticketno,))
mysql.connection.commit()
msg = 'Your complaint is Assigned to Agent !'

mailcursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)
mailcursor.execute('SELECT customer_email FROM complaint_details WHERE ticket_no = %s',
(ticketno,))
customer_mail = mailcursor.fetchone()

for x in customer_mail:
    cemail = customer_mail[x]

try:
    mailmsg = Message('Customer Care Registry', sender = 'Agent Assigned', recipients = ['{}', cemail])
    mailmsg.body = "Hello,\nWe have received your complaint and agent { } has been Successfully
Assigned\nYour Ticket Number: {} \n\nYou will be notified when your complain will be
solved.".format(agentassign, ticketno)
    mail.send(mailmsg)
except:
    pass
    return redirect(url_for('admindashboard'))
elif request.method == 'POST':
    msg = 'Please fill out the form !'
    return render_template('admindashboard.html', msg = msg, data=data, agent=agent, pending=pending,
assigned=assigned, completed=completed)
```

```
@app.route('/adminanalytics')
def adminanalytics():
    mycursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)
    mycursor.execute('SELECT COUNT(agent_name) AS JenTile FROM complaint_details WHERE
agent_name = %s', ("Jen Tile",))
    JenTile = mycursor.fetchall()
    mycursor.execute('SELECT COUNT(agent_name) AS AllieGrater FROM complaint_details WHERE
agent_name = %s', ("Allie Grater",))
    AllieGrater = mycursor.fetchall()
    mycursor.execute('SELECT COUNT(agent_name) AS RaySin FROM complaint_details WHERE
agent_name = %s', ("Ray Sin",))
    RaySin = mycursor.fetchall()
    mycursor.execute('SELECT COUNT(category) AS Category1 FROM complaint_details WHERE category
= %s', ("Product Exchange or Return",))
    category1 = mycursor.fetchall()
    mycursor.execute('SELECT COUNT(category) AS Category2 FROM complaint_details WHERE category
= %s', ("Product Out of Stock",))
```

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```
category2 = mycursor.fetchall()
myscursor.execute('SELECT COUNT(category) AS Category3 FROM complaint_details WHERE category
= %s', ("Payments & Transactions",))
category3 = mycursor.fetchall()
myscursor.execute('SELECT COUNT(category) AS Category4 FROM complaint_details WHERE category
= %s', ("Product Delivery",))
category4 = mycursor.fetchall()
myscursor.execute('SELECT COUNT(category) AS Category5 FROM complaint_details WHERE category
= %s', ("Other",))
category5 = mycursor.fetchall()
print(category1)
return render_template('adminanalytics.html', JenTile=JenTile, AllieGrater=AllieGrater, RaySin=RaySin,
category1=category1, category2=category2, category3=category3, category4=category4,
category5=category5)
```

```
@app.route('/customerforgotpassword', methods =['GET', 'POST'])
def customerforgotpassword():
    msgdecline = "
    if request.method == 'POST' and 'customerforgotemail' in request.form :
        forgotemail = request.form['customerforgotemail']
        cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)
        cursor.execute('SELECT * FROM customers_details WHERE customer_email = % s', (forgotemail, ))
        customers_details = cursor.fetchone()
        if customers_details:
            session['customerforgotemail'] = forgotemail
            otp = random.randint(1000, 9999)
            session['otp'] = otp
            try:
                mailmsg = Message('Customer Care Registry', sender = 'Forgot Password', recipients = ['{}',
forgotemail])
                mailmsg.body = "Hello, \nYour OTP is: {} \nDo not share this OTP to anyone \nUse this OTP to
reset your password.".format(otp)
                mailmsg.subject = 'Forgot Passowrd'
                mail.send(mailmsg)
                flash('OTP has been sent to your email')
                return redirect(url_for('enterotp'))
            except:
                msgdecline = 'Oops! Something went wrong! Email not sent'
        else:
            msgdecline = 'This email is not registered!'
    return render_template('customerforgotpassword.html', msgdecline = msgdecline)
```

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```
@app.route('/agentforgotpassword', methods=['GET', 'POST'])
def agentforgotpassword():
    msgdecline = "
    if request.method == 'POST' and 'agentforgotemail' in request.form :
        forgotemail = request.form['agentforgotemail']
        cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)
        cursor.execute('SELECT * FROM agent_information WHERE agent_email = % s', (forgotemail, ))
        agent_information = cursor.fetchone()
        if agent_information:
            session['agentforgotemail'] = forgotemail
            otp = random.randint(1000, 9999)
            session['otp'] = otp
            try:
                mailmsg = Message('Customer Care Registry', sender = 'Forgot Password', recipients = ['{}',
forgotemail])
                mailmsg.body = "Hello, \nYour OTP is: {} \nDo not share this OTP to anyone \nUse this OTP to
reset your password.".format(otp)
                mail.send(mailmsg)
                flash('OTP has been sent to your email')
                return redirect(url_for('enterotp'))
            except:
                msgdecline = 'Oops! Something went wrong! Email not sent'
        else:
            msgdecline = 'This email is not registered!'
    return render_template('agentforgotpassword.html', msgdecline = msgdecline)
```

```
@app.route('/adminforgotpassword', methods=['GET', 'POST'])
def adminforgotpassword():
    msgdecline = "
    if request.method == 'POST' and 'adminforgotemail' in request.form :
        forgotemail = request.form['adminforgotemail']
        cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)
        cursor.execute('SELECT * FROM admin_details WHERE admin_email = % s', (forgotemail, ))
        admin_details = cursor.fetchone()
        if admin_details:
            session['adminforgotemail'] = forgotemail
            otp = random.randint(1000, 9999)
            session['otp'] = otp
            try:
                mailmsg = Message('Customer Care Registry', sender = 'Forgot Password', recipients = ['{}',
forgotemail])
                mailmsg.body = "Hello, \nYour OTP is: {} \nDo not share this OTP to anyone \nUse this OTP to
reset your password.".format(otp)
                mail.send(mailmsg)
```

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```
flash('OTP has been sent to your email')
return redirect(url_for('enterotp'))
except:
    msgdecline = 'Oops! Something went wrong! Email not sent'
else:
    msgdecline = 'This email is not registered!'
return render_template('adminforgotpassword.html', msgdecline = msgdecline)
```

```
@app.route('/enterotp', methods =['GET', 'POST'])
def enterotp():
    msgdecline = "
    if request.method == 'POST' and 'otp' in request.form :
        otp = int(request.form['otp'])
        if int(session['otp']) == otp:
            msgsuccess = 'success'
            return redirect(url_for('changepassword'))
        else:
            msgdecline = 'You have entered wrong OTP'
    elif request.method == 'POST':
        msg = 'Please fill out the form !'
    return render_template('enterotp.html', msgdecline = msgdecline)
```

```
@app.route('/changepassword', methods =['GET', 'POST'])
def changepassword():
    msgdecline = "
    if request.method == 'POST' and 'newpassword' in request.form and 'confirmnewpassword' in
request.form:
        newpassword = request.form['newpassword']
        confirmnewpassword = request.form['confirmnewpassword']
        if newpassword == confirmnewpassword:
            cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)
            if session.get("customerforgotemail"):
                cursor.execute('UPDATE customers_details SET customer_password = %s WHERE
customer_email = %s', (newpassword, session['customerforgotemail'],) )
                mysql.connection.commit()
                flash('Your password changed Successful! Try Login')
                return redirect(url_for('customerlogin'))
            elif session.get("agentforgotemail"):
                cursor.execute('UPDATE agent_information SET agent_password = %s WHERE agent_email =
%s', (newpassword, session['agentforgotemail'],) )
                mysql.connection.commit()
                flash('Your password changed Successful! Try Login')
                return redirect(url_for('agentlogin'))
            elif session.get("adminforgotemail"):
```

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```
        cursor.execute('UPDATE admin_details SET admin_password = %s WHERE admin_email = %s',
(newpassword, 'admin@xyz',) )
        mysql.connection.commit()
        flash('Password changed Successful! Try Login')
        return redirect(url_for('adminlogin'))
    else:
        msgdecline = 'Incorrect details'
    else:
        msgdecline = 'Password Did Not Match!'
    elif request.method == 'POST':
        msgdecline = 'Please fill out the form !'
    return render_template('changepassword.html', msgdecline = msgdecline)
```

```
@app.route('/logout')
def logout():
    session.pop('loggedin', None)
    session.pop('cemail', None)
    session.pop('aemail', None)
    session.pop('adminusername', None)
    return redirect(url_for('index'))
```

```
@app.route('/offline.html')
def offline():
    return app.send_static_file('offline.html')
```

```
@app.route('/service-worker.js')
def sw():
    return app.send_static_file('service-worker.js')
```

```
@app.errorhandler(404)
def invalid_route(e):
    return render_template('404.html')
```

```
if __name__ == '__main__':
    app.run(host='0.0.0.0', debug = True, port = 8080)
```


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GitHub Link:

<https://github.com/IBM-EPBL/IBM-Project-15708-1659603319>

Video Demo Link:

https://drive.google.com/file/d/1IJSTglFHdWN3H-EKBYEbgAu0abaeRvFx/view?usp=share_link