

CUSTOMER CARE REGISTRY

PROJECT REPORT

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(An Autonomous Institution)

(Approved by AICTE and Affiliated to Anna University, Chennai)

ACCREDITED BY NAAC WITH “A” GRADE

BONAFIDE CERTIFICATE

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CHAPTER 1

INTRODUCTION

Managing Customer Queries is a tedious task as the growth of internet and users across all the fields of customer management is one of the important aspects that companies focus on for better management of customer queries. Customer service is reactive. Customer care and customer service together help create a positive customer experience, or the overall impression a person has when interacting with your company. Both are vital, but there are subtle differences in how they are implemented.

1.1 Project overview:

High-quality customer care is proactive. The needs of customers throughout the buyer's journey are anticipated, making customers feel supported. That, in turn, helps create an emotional connection between the customer and the company. Here, the focus is on helping customers solve problems or answer questions before purchase, either in a self-serve fashion or via the customer support team. To achieve the best customer service, your customer service team should address customer needs quickly and with as few customer interactions as possible. customer service is the most impactful driver category for the overall customer experience in B2B companies, eclipsing categories like products and prices. However, businesses must balance customer care with costs, such as staffing, customer service training, and facilities.

1.2 Purpose

Customer care registry is vital. Customer care is more than just providing great customer service. It's a proactive approach to providing information, tools, and services to customers at each point they interact with a brand. Customer service is the support you offer your customers both before and after they buy and use your products or services that helps them have an easy and enjoyable experience with you. The customer service team is the face of the organization and the frontline when customers require assistance.

CHAPTER 2

LITERATURE SURVEY

2.1 Existing Problem

- Managing customer relations is a tedious task.
- Lack of integrated dashboard in the market.
- Tracking of tickets is complex.
- Updates on progress are not available.

2.2References

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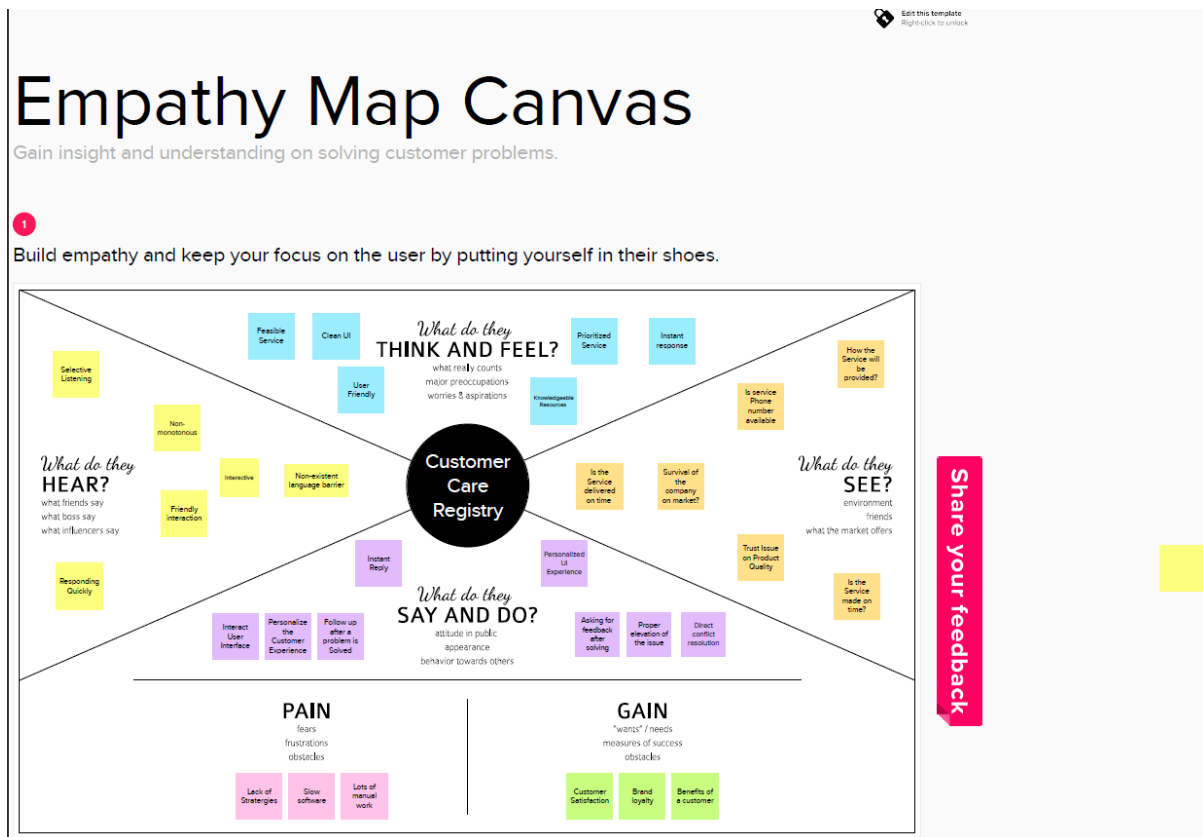
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2.3 Problem Statement Definition

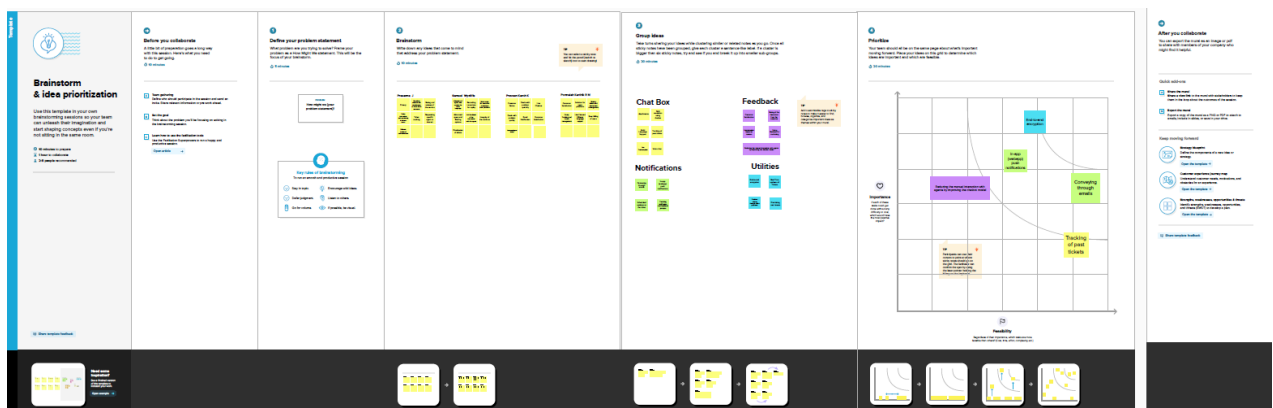
- The goal is to solve the issues raised by the customer by means of providing domain experts.
- We need to help the customer in processing their complaints. The customers can raise the ticket with a detailed description of the issue. An Agent will be assigned to the Customer to solve the problem. Whenever the agent is assigned to a customer they will be notified with an email alert. Customers can view the status of the ticket till the service is provided.

IDEATION AND PROPOSED SOLUTION

3.1 Empathy Map Canvas



3.2 Ideation & Brainstorming



3.3 Proposed Solution

| S.No. | Parameter | Description |
|-------|---|---|
| 1. | Problem Statement (Problem to be solved) | To Create a Platform which helps Resolve Customer issues using Cloud |
| 2. | Idea / Solution description | The solution involves creating a web app that does proper matchmaking with the right experts based on the issue at hand. |
| 3. | Novelty / Uniqueness | Webapp bootstrapped with features such as attachments, voice chats, automated chatbot. and lots of QOL features, all present in a single application. |
| 4. | Social Impact / Customer Satisfaction | Tickets get resolved based on the priority which will be useful in solving critical issues. |
| 5. | Business Model (Revenue Model) | Prioritised tickets and support, matching with the right experts, help to generate stable revenue. |
| 6. | Scalability of the Solution | The Project is implemented using cloud so that it is highly scalable and can be used by multiple users based on the requirements. |

3.4 Problem Solution fit

| | | | |
|---|---|--|---|
| Define CS, fit into CC | 1. CUSTOMER SEGMENT(S) CS Who is your customer? 1) Is a person in need of assistance. 2) Having a hard time explaining the issue. 3) People who are stuck in the middle of the process. | 6. CUSTOMER 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. 1) Spending time on explaining the issue. 2) Language Barriers. 3) Probability of getting the issue resolved. | 5. AVAILABLE SOLUTIONS AS Which solutions are available to the customers when they face the problem Search for online solutions in forums and 1) Calling Customer care agents. 2) Referring user Manuals. 3) Asking for expert's help. |
| | 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. 1) The application helps the customer to find a solution for the issue. 2) The issue will be prioritized based on their severity. 3) Customer can use attachments as well as voice chat for communication | 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. 1) Customers don't know how to understand their issue. 2) Lack of knowledge in using the project. 3) Problem faced by using the service. | 7. BEHAVIOUR BE What does your customer do to address the problem and get the job done? 1) Reads the manual. 2) Take proper time in formulating the issue. 3) Seeking direct help from peers. |
| 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. 1) Undesired feedback from the service. 2) Deadlines. | 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. Resolving client issues using web app based on the pre-defined guidelines designed for specific problems and tracking of all the issues of the client and their status. | 8. CHANNELS of BEHAVIOUR CH 8.1 ONLINE What kind of actions do customers take online? Extract online channels from #7 Search for online solutions in forums and report. 8.2 OFFLINE What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development. Ask for peers help or approach physical stores | Extract online & offline CH of BE |
| Identify strong TR & EM | 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. Frustrated, Irritated > Satisfied, Contended. | | |



Problem-Solution fit canvas is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 license Created by Datta Nigrahakrishna / Anantkuma.com



CHAPTER 4

REQUIREMENT ANALYSIS

4.1 Functional requirement

| FR No. | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task) |
|--------|-------------------------------|--|
| FR-1 | User Registration | Registration through Form Registration through Gmail Registration through LinkedIn |
| FR-2 | User Confirmation | Confirmation via Email Confirmation via OTP |
| FR-3 | User Login | Login via Google Login with Email id and Password |
| FR-4 | Raise Ticket | Description of the issues Contact information |
| FR-5 | Notifications | Updates on tickets through email and in-app |
| FR-6 | Interaction Room | A chatbox to have conversation 1 to 1 with the matched agent, send attachments, voice chat and live transcriptions |
| FR-7 | Feedback | Customer Feedback Form |

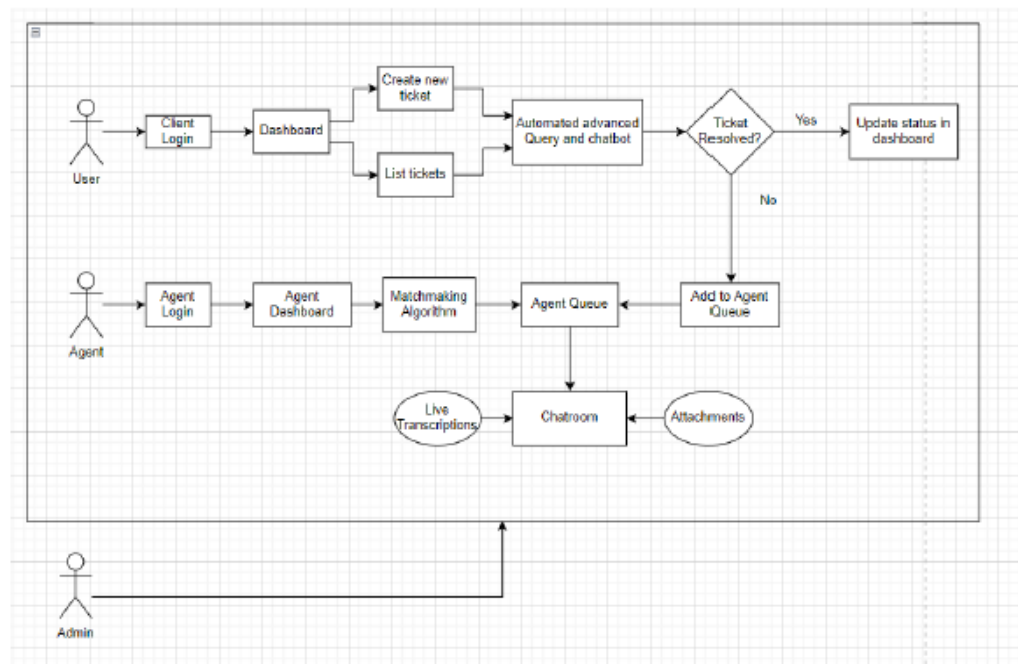
4.2 Non-Functional requirements

| FR No. | Non-Functional Requirement | Description |
|--------|----------------------------|---|
| NFR-1 | Usability | A personalized Web App with intuitive UI for ease of access |
| NFR-2 | Security | Authentication of accounts and end to end Encryption |
| NFR-3 | Reliability | Reliable servers hosted on cloud and tested project |
| NFR-4 | Performance | Fast latency times, by load balancing and evenly distributing workloads across clusters |
| NFR-5 | Availability | 24/7 service |
| NFR-6 | Scalability | Agents scalability as per the number of customers. |

PROJECT DESIGN

5.1 Data Flow Diagrams

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

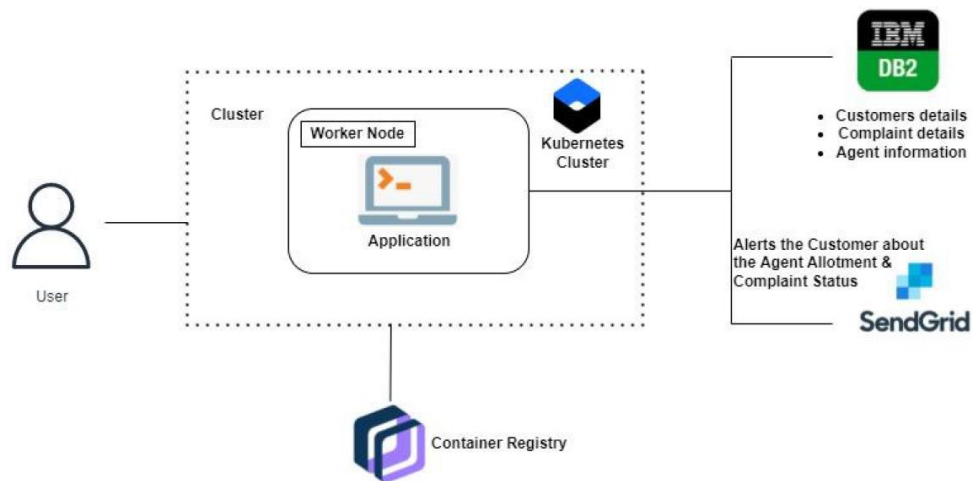


5.2 Solution & Technical Architecture

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

- Find the best tech solution to solve existing business problems.
- Describe the structure, characteristics, behavior, and other aspects of the software to project stakeholders.
- Define features, development phases, and solution requirements.

Provide specifications according to which the solution is defined, managed, and delivered.



5.3 User Stories

| User Type | Functional Requirement (Epic) | User Story Number | User Story / Task | Acceptance criteria | Priority | Release |
|---------------------|-------------------------------|-------------------|---|---|----------|----------|
| Customer (Web user) | Registration | USN-1 | As a user, I can register for the application by entering my email, password, and confirming my password. | I can access my account / dashboard | High | Sprint-1 |
| | Authentication | USN-2 | As a user, I will receive confirmation email once I have registered for the application | I can receive confirmation email & click confirm | Medium | Sprint-1 |
| | Login | USN-3 | As a user, I can log into the application by entering email & password | I can view the dashboard | High | Sprint-1 |
| | Dashboard | USN-4 | As a customer, I can do manipulation of tickets, checking their status | I can add, remove, edit tickets | High | Sprint-2 |
| | Create new Ticket | USN-5 | As a user, we can raise new ticket to solve the problem faced | I can use the chatbot | High | Sprint-2 |
| | Chatbot | USN-6 | As a user, I can chat with the solutions providing chat solutions based on the description of the issue. | providing list of troubleshooting solutions | Low | Sprint-2 |
| Agent(Web user) | Login | USN-1 | As an Agent, I can login with my given credentials from admin | I can access my account / dashboard | High | Sprint-3 |
| | Dashboard | USN-2 | As an Agent, I can see the list of tickets assigned to me from the matchmaking algorithm | I can get real-time updates on the status of list of tickets assignment to me | High | Sprint-3 |
| | Ticket Queue | USN-3 | As an Agent, I can view the pending tickets and solve them in order of the queue | I can communicate with the client and speak about the tickets and help the client | Medium | Sprint-4 |
| Administrator | Login | USN-1 | As an Administrator, I can login using a predefined set of credentials, given to me by the software vendor | I can access my account/dashboard | Medium | Sprint-4 |
| | Manage | USN-2 | As an Administrator, I can manage all the tickets raised and the queries solved in the portal with special rights across the functionalities of the web app | I can access all the queries and current process in the dashboard | High | Sprint-4 |

CHAPTER 6

PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

Product Backlog, Sprint Schedule, and Estimation

| Sprint | Functional Requirement (Epic) | User Story Number | User Story / Task | Story Points | Priority | Team Members |
|----------|-------------------------------|-------------------|--|--------------|----------|--|
| Sprint-1 | User Panel | USN-1 | The user will login into the portal, interact and avail the services present | 20 | High | PRASANNA J PRAVEEN KANTH K Ponnaiah Karthik R M |
| Sprint-2 | Admin panel | USN-2 | The admin's role is to monitor and oversee the status of the portal | 20 | High | SAMUEL WYCLIFFE J Ponnaiah Karthik R M |
| Sprint-3 | Chat Bot | USN-3 | The user can directly talk to Chatbot regarding the services. Get the recommendations based on information provided by the user. | 20 | High | PRAVEEN KANTH K PRASANNA J |
| Sprint-4 | final delivery | USN-4 | Container of applications using docker kubernetes and deployment the application.Create the documentation and final submit the application | 20 | High | Ponnaiah Karthik R M PRAVEEN KANTH K PRASANNA J SAMUEL WYCLIFFE J |

6.2 Sprint Delivery Schedule :

Project Tracker, Velocity & Burndown Chart

| 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 | 21 Oct 2022 | 28 Oct 2022 | | 29 Oct 2022 |
| Sprint-2 | 20 | 8 Days | 29 Oct 2022 | 05 Nov 2022 | | 04 Nov 2022 |
| Sprint-3 | 20 | 7 Days | 05 Nov 2022 | 11 Nov 2022 | | 11 Nov 2022 |
| Sprint-4 | 20 | 5 Days | 13 Nov 2022 | 17 Nov 2022 | | 18 Nov 2022 |

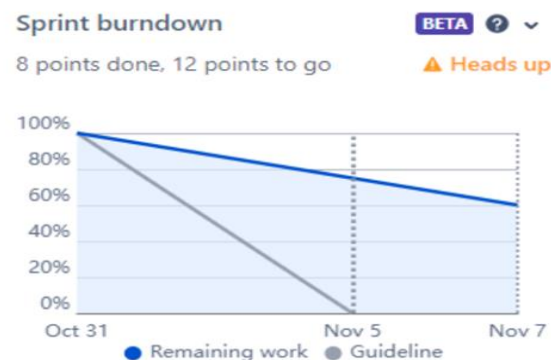
Velocity:

Velocity is a metric that predicts how much work an Agile software development team can successfully complete within a two-week sprint (or similar time-boxed period). Velocity is a useful planning tool for estimating how fast work can be completed and how long it will take to complete a project

Average velocity = Total story points/ No. of iterations = 80/4 = 20

Burndown Chart:

A burndown chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.



6.3 Reports from JIRA

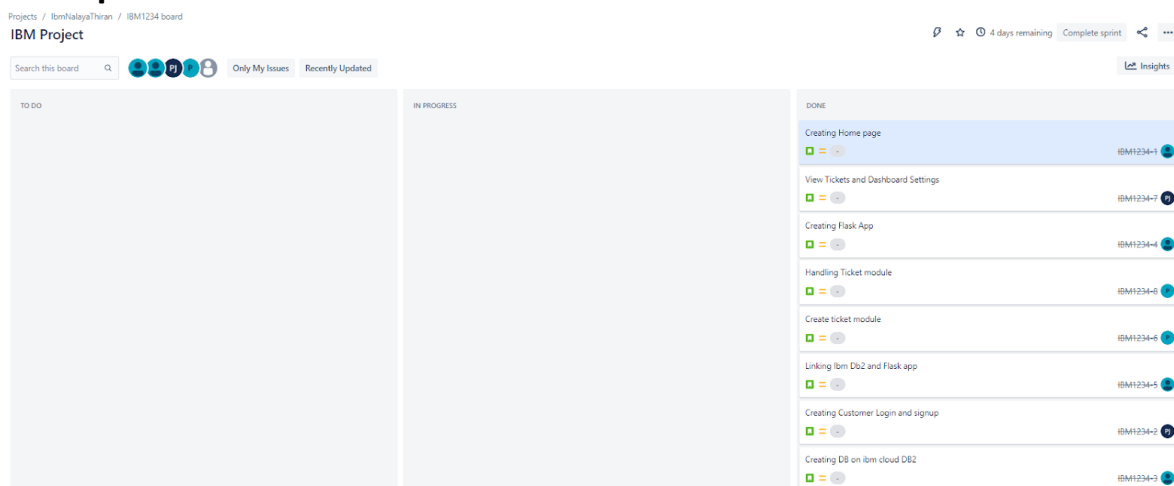
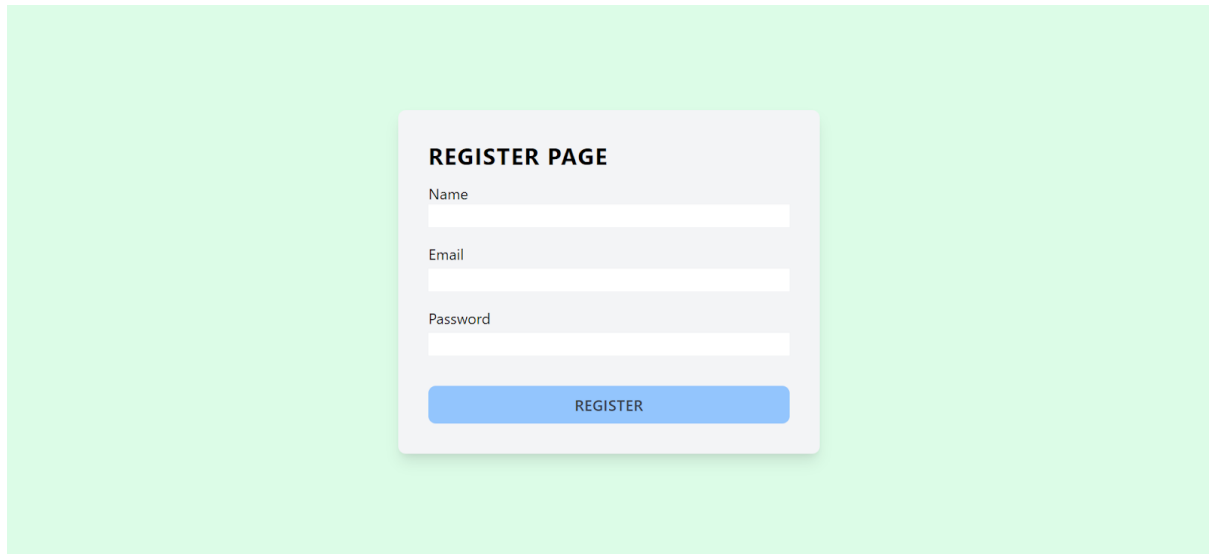


Figure 6.1 Sprint Dashboard

CHAPTER 7

CODING & SOLUTIONING

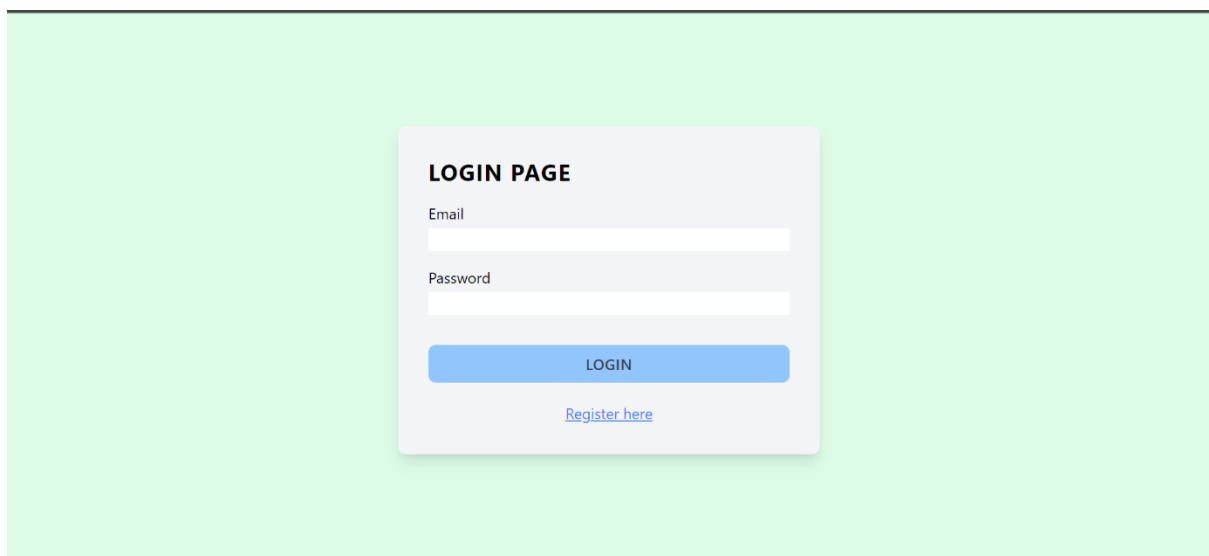
7.1 Feature 1



A screenshot of a customer registration page. The page has a light green background. In the center, there is a white rectangular box with a light gray border and a subtle shadow. Inside this box, the title "REGISTER PAGE" is displayed in bold black text. Below the title, there are three input fields: "Name", "Email", and "Password", each with a light gray label and a white input area. At the bottom of the box, there is a blue button with the text "REGISTER" in white capital letters.

Figure 7.1 Customer Registration page

7.2 Feature 2



A screenshot of a customer login page. The page has a light green background. In the center, there is a white rectangular box with a light gray border and a subtle shadow. Inside this box, the title "LOGIN PAGE" is displayed in bold black text. Below the title, there are two input fields: "Email" and "Password", each with a light gray label and a white input area. At the bottom of the box, there is a blue button with the text "LOGIN" in white capital letters. Below the button, there is a link that says "Register here" in blue text.

Figure 7.2 Customer Login page

7.3 Feature 3

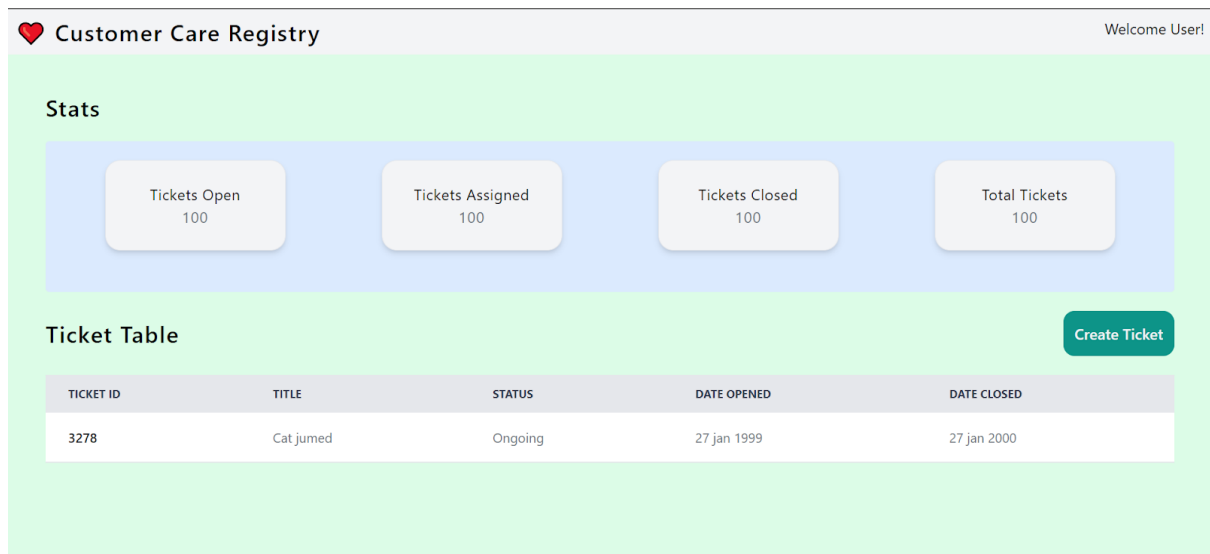


Figure 7.3 Customer Dashboard

7.4 Feature 4

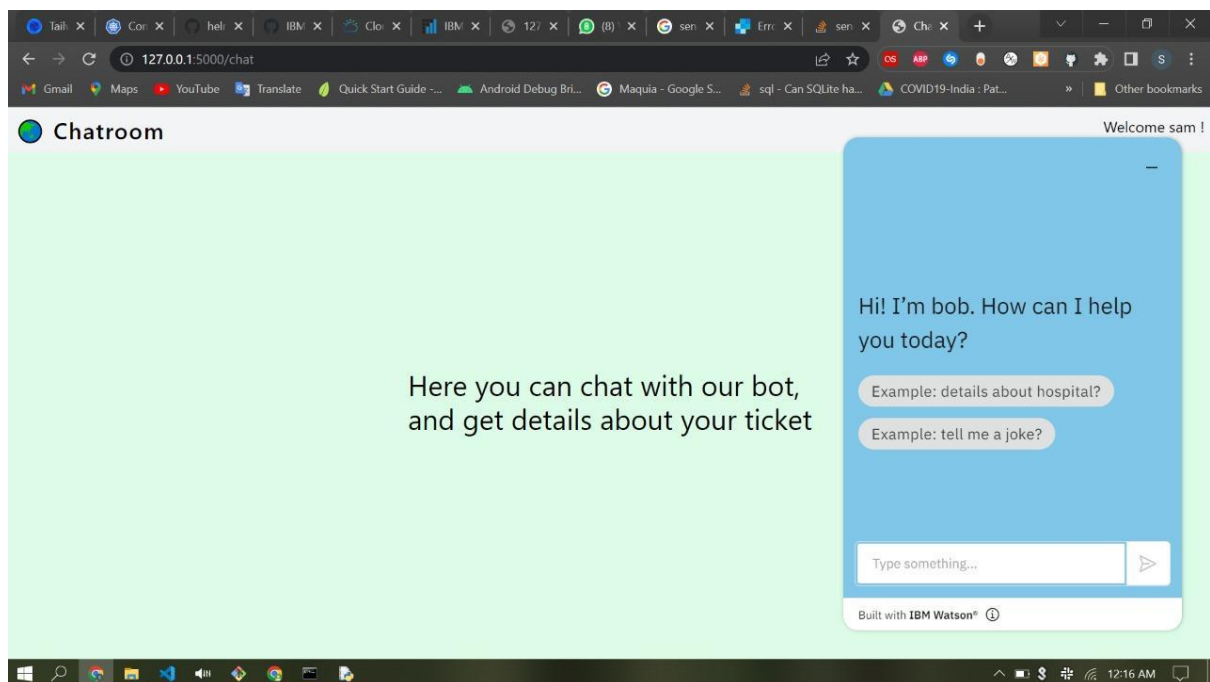


Figure 7.4 ChatBot Page

7.5 Feature 5

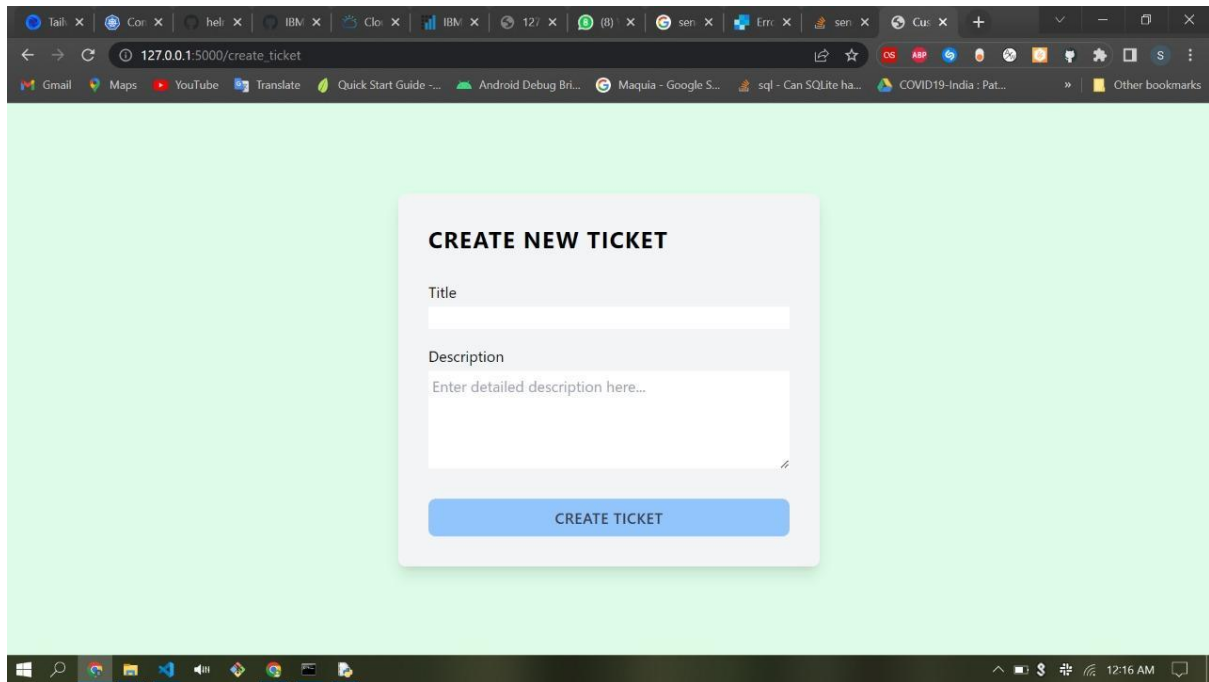


Figure 7.1 New Ticket Page

CHAPTER 8

TESTING

8.1 TEST CASES

1. Login button click with wrong credentials entered.
2. Signup with wrong form data entered.
3. Entering home page with logged out session.
4. Creating Ticket without content.

8.2 USER ACCEPTANCE TESTING

| s.no | Test Case id | Feature Type | component | Test description | Input test Data | Actual output | Expected output | remarks |
|------|--------------|--------------|---------------|--|---|-------------------------|-------------------------|---------|
| 1 | TC – RG 01 | Functional | Register page | register for the application by entering email, password | test@gmail.com ***** | Registration successful | Registration successful | pass |
| 2 | TC – SI 01 | Functional | Login page | log into the application by entering email & password | test@gmail.com ***** | Login successful | Login successful | pass |

| | | | | | | | | |
|---|------------------|----------------|--------------------------|---|---|-------------------------------------|-------------------------------------|------|
| 3 | TC – ST 01 | UI | Dashboard page | view my history of tickets of the user | | All the tickets are displayed | All the tickets are displayed | pass |
| 4 | TC – SI 02 | Functiona l | Dashboard | can logout | | Go to sign page | Sign in page displayed | pass |
| 5 | TC – ST 02 | Functiona l | Create Ticket page | create new ticket | Ticket Title Ticket description | Ticket created | Ticket created | pass |
| 6 | TC – ST 03 | Functiona l | Dashboard page | can delete ticket | | Ticket deleted | Ticket deleted | pass |
| 7 | TC – ST 04 | Functiona l | Home page | can use chatbot | | chatBot initiated | chatBot initiated | pass |
| 8 | TC – ST 05 | Functiona l | Tickets page | updates on tickets is being sent to email | | email received successfully | email received successfully | pass |

CHAPTER 9

RESULTS

9.1 PERFORMANCE METRICS

1. Hours worked : 50 hours
2. Stick to Timelines : 100%
3. Consistency of the product : 75%
4. Efficiency of the product : 80%
5. Quality of the product : 85%

CHAPTER 10

ADVANTAGES & DISADVANTAGES

Advantages

- To get expertise solutions for customer issues and complaints.
- Makes it easy for customers to do business with you.
- Less prone to errors due to expert guidance.
- Effective sharing of information
- Prevention of unnecessary searches to find people and make them understand the issue in hand, for a solution.
- Saves time, by providing expert guidance in a single port
- Automation of ticket status, progress and report generation, makes it easy for customers to get a high-level overview of the given solution.

Disadvantages

Time and cooperation requirement

The customer is required to cooperate with the agent after creating the ticket. Any discrepancies or inactiveness from the customer side leads to further delaying the issue. At the worst cases, sometimes, not converging to a proper solution.

Data Safety

Data security is a big challenge that needs to be taken care of during the development phase of the application. Data storage is usually the target of hackers. This endangers the safety of customer data. Organisations are very much concerned about the safety of customers' personal data. For this, all CRM applications must meet the requirement for data security and be HIPAA compliant before they can be deployed for public services.

CHAPTER 11 CONCLUSION

Cloud computing is the delivery of different services through the Internet. It is a popular option for people and businesses for a number of reasons including cost savings, increased productivity, speed and efficiency, performance, and security. Cloud-based storage makes it possible to save files to a remote database and retrieve them on demand. It takes all the heavy lifting involved in crunching and processing data away from the device you carry around or sit and work at. It also moves all of that work to huge computer clusters far away in cyberspace. The Internet becomes the cloud, and voilà—your data, work, and applications are available from any device with which you can connect to the Internet, anywhere in the world.

We've integrated automated mailing systems, and made a highly scalable application.

CHAPTER 12 FUTURE SCOPE

Cloud computing has grown into a major paradigm in the tech world. It enables ubiquitous and simple on-demand access to shared computing resources via configurable Internet services.

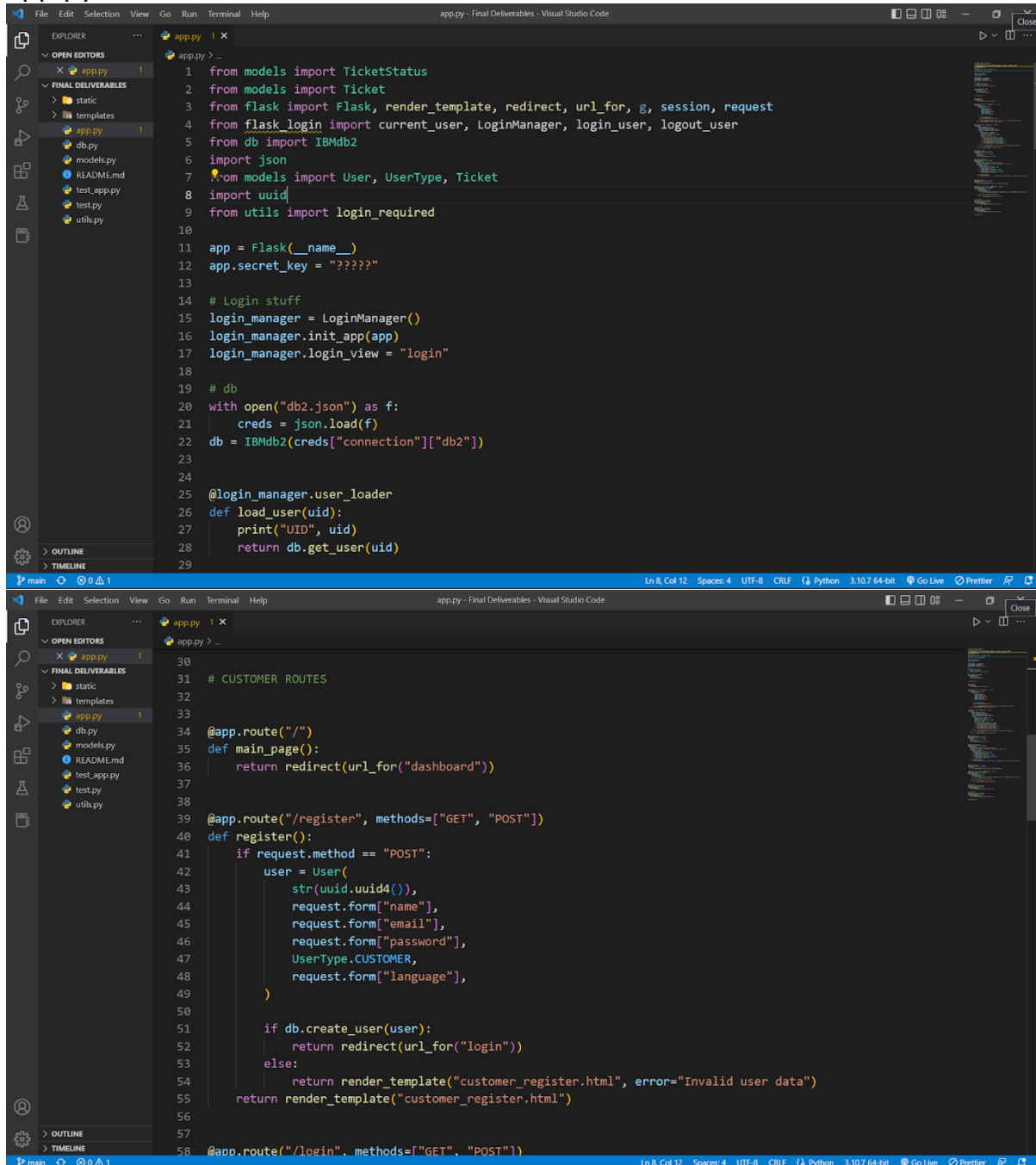
Countries around the world have started to invest more capital in CRM infrastructure, Customer relation enhancement, Better customer support. The market is growing and will continue to expand, given the benefits of business improvements due to good customer support. Customer relations is now considered as one of the important business acumens. It is the most looked after field by many business professionals who are planning to improve the market share. As the technology is evolving there are a lot of new features added on continuous intervals is one of the promising fields of the future.

CHAPTER13

APPENDIX

Source Code

app.py



```
1  from models import TicketStatus
2  from models import Ticket
3  from flask import Flask, render_template, redirect, url_for, g, session, request
4  from flask_login import current_user, LoginManager, login_user, logout_user
5  from db import IBMDb2
6  import json
7  from models import User, UserType, Ticket
8  import uuid
9  from utils import login_required
10
11 app = Flask(__name__)
12 app.secret_key = "?????"
13
14 # Login stuff
15 login_manager = LoginManager()
16 login_manager.init_app(app)
17 login_manager.login_view = "login"
18
19 # db
20 with open("db2.json") as f:
21     creds = json.load(f)
22 db = IBMDb2(creds["connection"]["db2"])
23
24
25 @login_manager.user_loader
26 def load_user(uid):
27     print("UID", uid)
28     return db.get_user(uid)
29
30
31 # CUSTOMER ROUTES
32
33
34 @app.route("/")
35 def main_page():
36     return redirect(url_for("dashboard"))
37
38
39 @app.route("/register", methods=["GET", "POST"])
40 def register():
41     if request.method == "POST":
42         user = User(
43             str(uuid.uuid4()),
44             request.form["name"],
45             request.form["email"],
46             request.form["password"],
47             UserType.CUSTOMER,
48             request.form["language"],
49         )
50
51         if db.create_user(user):
52             return redirect(url_for("login"))
53         else:
54             return render_template("customer_register.html", error="Invalid user data")
55     return render_template("customer_register.html")
56
57
58 @app.route("/login", methods=["GET", "POST"])
```

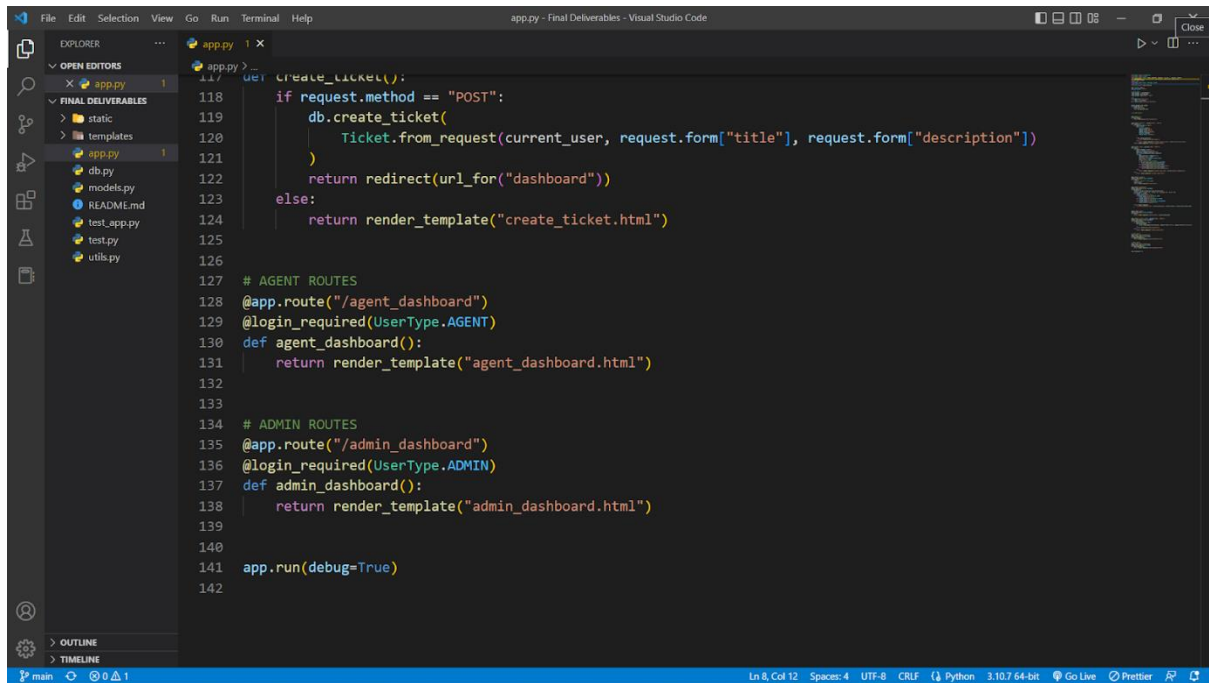
The image displays two screenshots of a Visual Studio Code editor window, showing Python code for a web application. The top screenshot shows the `login` function, and the bottom screenshot shows the `dashboard`, `chat`, and `create_ticket` functions.

Top Screenshot: `login` function

```
57
58 @app.route("/login", methods=["GET", "POST"])
59 def login():
60     if request.method == "POST":
61         email = request.form["email"]
62         password = request.form["password"]
63         user = db.validate_user(email, password)
64         if user:
65             login_user(user, remember=True)
66             session["user"] = user
67             user.role = UserType(int(user.role))
68             print("login", user)
69             # TODO use the next parameter
70             if current_user.role == UserType.CUSTOMER:
71                 return redirect(url_for("dashboard"))
72             elif current_user.role == UserType.AGENT:
73                 return redirect(url_for("agent_dashboard"))
74             elif current_user.role == UserType.ADMIN:
75                 return redirect(url_for("admin_dashboard"))
76         else:
77             return render_template("customer_login.html", error="Invalid credentials")
78     else:
79         return render_template("customer_login.html")
80
81
82 @app.route("/logout")
83 @login_required(UserType.CUSTOMER)
84 def logout():
85     # TODO or redirect to main_page
```

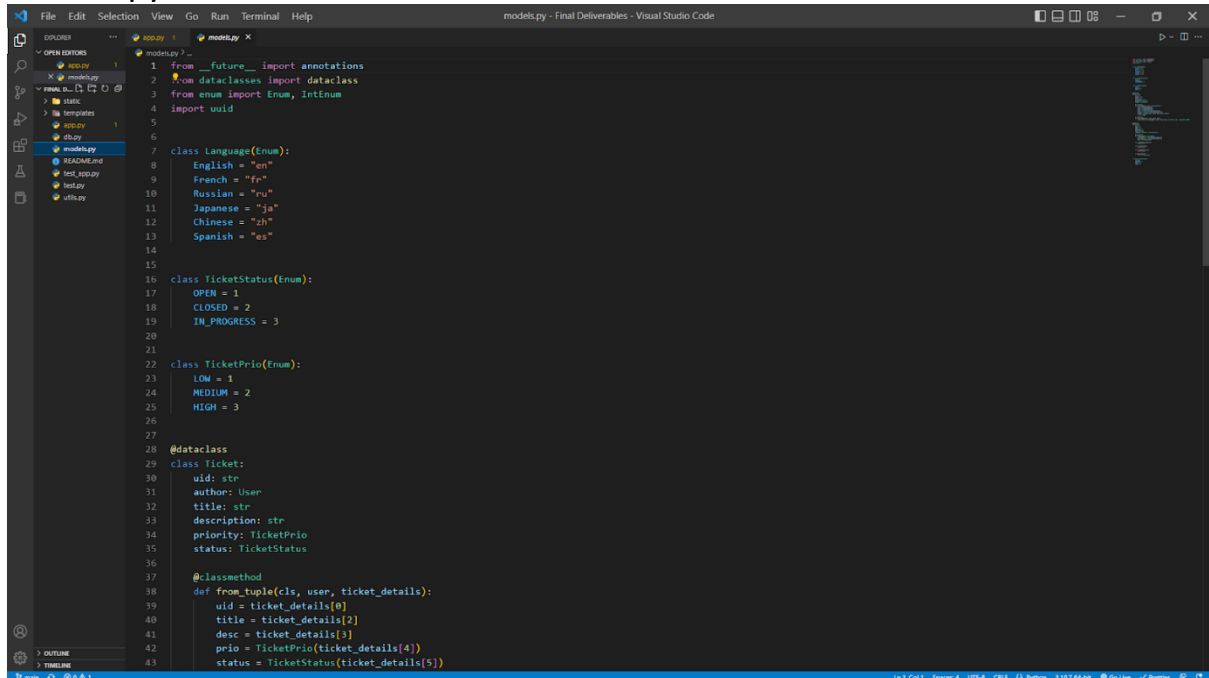
Bottom Screenshot: `dashboard`, `chat`, and `create_ticket` functions

```
90 @app.route("/dashboard")
91 @login_required(UserType.CUSTOMER)
92 def dashboard():
93     tickets = db.get_tickets_for_user(current_user)
94     ticket_stats = {"open": 0, "closed": 0, "assigned": 0, "total": 0}
95     for ticket in tickets:
96         ticket_stats["total"] += 1
97         if ticket.status == TicketStatus.OPEN:
98             ticket_stats["open"] += 1
99         elif ticket.status == TicketStatus.CLOSED:
100             ticket_stats["closed"] += 1
101         elif ticket.status == TicketStatus.IN_PROGRESS:
102             ticket_stats["assigned"] += 1
103
104     return render_template(
105         "customer_dashboard.html", user=current_user, tickets=tickets, ticket_stats=ticket_stats
106     )
107
108
109 @app.route("/chat")
110 @login_required(UserType.CUSTOMER)
111 def chat():
112     return render_template("chatroom.html", user=current_user)
113
114
115 @app.route("/create_ticket", methods=["GET", "POST"])
116 @login_required(UserType.CUSTOMER)
117 def create_ticket():
118     if request.method == "POST":
```

```
117 def create_ticket():
118     if request.method == "POST":
119         db.create_ticket(
120             Ticket.from_request(current_user, request.form["title"], request.form["description"])
121         )
122         return redirect(url_for("dashboard"))
123     else:
124         return render_template("create_ticket.html")
125
126
127 # AGENT ROUTES
128 @app.route("/agent_dashboard")
129 @login_required(UserType.AGENT)
130 def agent_dashboard():
131     return render_template("agent_dashboard.html")
132
133
134 # ADMIN ROUTES
135 @app.route("/admin_dashboard")
136 @login_required(UserType.ADMIN)
137 def admin_dashboard():
138     return render_template("admin_dashboard.html")
139
140
141 app.run(debug=True)
142
```

models.py



```
1 from __future__ import annotations
2 from dataclasses import dataclass
3 from enum import Enum, IntEnum
4 import uuid
5
6
7 class Language(Enum):
8     English = "en"
9     French = "fr"
10     Russian = "ru"
11     Japanese = "ja"
12     Chinese = "zh"
13     Spanish = "es"
14
15
16 class TicketStatus(Enum):
17     OPEN = 1
18     CLOSED = 2
19     IN_PROGRESS = 3
20
21
22 class TicketPrio(Enum):
23     LOW = 1
24     MEDIUM = 2
25     HIGH = 3
26
27
28 @dataclass
29 class Ticket:
30     uid: str
31     author: User
32     title: str
33     description: str
34     priority: TicketPrio
35     status: TicketStatus
36
37     @classmethod
38     def from_tuple(cls, user, ticket_details):
39         uid = ticket_details[0]
40         title = ticket_details[2]
41         desc = ticket_details[3]
42         prio = TicketPrio(ticket_details[4])
43         status = TicketStatus(ticket_details[5])
44
```

```
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models.py - Final Deliverables - Visual Studio Code

models.py
43 status = TicketStatus(ticket_details[5])
44 ticket = cls(uid, user, title, desc, prio, status)
45 return ticket
46
47 @classmethod
48 def from_request(cls, user, title, desc):
49     return cls(str(uuid.uuid4()), user, title, desc, TicketPrio.LOW, TicketStatus.OPEN)
50
51
52 @dataclass
53 class User:
54     uid: str
55     name: str
56     email: str
57     password: str
58     role: UserType
59     language: Language = Language.English
60
61 @classmethod
62 def from_tuple(cls, user_data):
63     user_data[-1] = Language[user_data[-1]]
64     user_data[-2] = UserType[user_data[-2]]
65     user = cls(*user_data)
66
67 def is_authenticated(self):
68     return True
69
70 def is_active(self):
71     return True
72
73 def is_anonymous(self):
74     return False
75
76 def get_id(self):
77     return str(self.uid)
78
79
80 class UserType(IntEnum):
81     ANY = 0
82     CUSTOMER = 1
83     AGENT = 2
84     ADMIN = 3
85
```

utils.py

```
File Edit Selection View Go Run Terminal Help
utils.py - Final Deliverables - Visual Studio Code

utils.py
1 from flask import current_app
2 from models import User
3 import re
4 from models import UserType
5 from functools import wraps
6 from flask_login import current_user
7
8
9 def valid_user_data(user: User):
10     if not user.name or not user.email or not user.password:
11         return False
12     if not re.match(r"^[^@]+@[^@]+\.[^@]+$", user.email):
13         return False
14     return True
15
16
17 def login_required(role: UserType = UserType.ANY):
18     def wrapper(fn):
19         @wraps(fn)
20         def decorated_view(*args, **kwargs):
21             print(current_app.name, "AAA")
22             if not current_app.config.get('SECRET_KEY'):
23                 return current_app.login_manager.unauthorized()
24
25             print("Login request", role, current_user.role)
26             if role != UserType.ANY and current_user.role != role:
27                 return current_app.login_manager.unauthorized()
28
29             return fn(*args, **kwargs)
30         return decorated_view
31     return wrapper
32
33
34
```

db.py

```
from typing import Optional

import ibm_db
import ibm_db_dbi
from werkzeug.security import check_password_hash, generate_password_hash

from models import Ticket, User, UserType
from utils import valid_user_data


class IBMdb2:
    def __init__(self, db2):
        self.conn = ibm_db.connect(
            f"DATABASE={db2['database']};HOSTNAME={db2['hosts'][0]['hostname']};PORT={db2['hosts'][0]['port']};PROTOCOL=TCPIP;UID={db2['authentication']['username']};PW="
        )
        ibm_db.autocommit(self.conn, ibm_db.SQL_AUTOCOMMIT_ON)

    def create_user(self, user: User):
        if not valid_user_data(user):
            return False

        insert_stmt = "INSERT INTO users VALUES (?, ?, ?, ?, ?, ?)"
        stmt = ibm_db.prepare(self.conn, insert_stmt)
        params = (
            str(uuid.uuid4()),
            user.name,
            user.email,
            generate_password_hash(user.password),
            user.role.value,
            user.language if isinstance(user.language, str) else user.language.value,
        )
        ibm_db.execute(stmt, params)
        return True

    def get_user(self, uid):
        stmt = ibm_db.prepare(self.conn, "SELECT * FROM users WHERE uid = ?")
        ibm_db.bind_param(stmt, 1, uid)
        ibm_db.execute(stmt)
```

```
user_data = ibm_db.fetch_tuple(stmt)
print("get_user data", user_data)
if user_data:
    user = User(*user_data)
    user.role = UserType(int(user.role))
    return user
return None

def get_user_from_email(self, email):
    stmt = ibm_db.prepare(self.conn, "SELECT * FROM users WHERE email = ?")
    ibm_db.bind_param(stmt, 1, email)
    ibm_db.execute(stmt)

    user_data = ibm_db.fetch_tuple(stmt)
    if user_data:
        user = User(*user_data)
        user.role = UserType(int(user.role))
        return user
    return None

def validate_user(self, email, password) -> Optional[User]:
    # Save a db call
    if not valid_user_data(User("", "DUMMY_USER", email, password, UserType.ANY)):
        return None
    user = self.get_user_from_email(email)
    if user and check_password_hash(user.password, password):
        return user
    return None

def create_ticket(self, ticket: Ticket):
    insert_stmt = "INSERT INTO tickets (uid, author, title, description, priority, status) VALUES (?, ?, ?, ?, ?, ?)"
    stmt = ibm_db.prepare(self.conn, insert_stmt)
    params = (
        str(uuid.uuid4()),
        ticket.author.uid,
        ticket.title,
        ticket.description,
        ticket.priority.value,
        ticket.status.value,
    )
    ibm_db.execute(stmt, params)
    return True
```

```
def create_ticket(self, ticket: Ticket):
    insert_stmt = "INSERT INTO tickets (uid, author, title, description, priority, status) VALUES (?, ?, ?, ?, ?, ?)"
    stmt = ibm_db.prepare(self.conn, insert_stmt)
    params = (
        str(uuid.uuid4()),
        ticket.author.uid,
        ticket.title,
        ticket.description,
        ticket.priority.value,
        ticket.status.value,
    )
    ibm_db.execute(stmt, params)
    return True

def get_tickets_for_user(self, user: User):
    stmt = ibm_db.prepare(self.conn, "SELECT * FROM tickets WHERE author = ?")
    ibm_db.bind_param(stmt, 1, user.uid)
    ibm_db.execute(stmt)

    tickets = []
    row = ibm_db.fetch_tuple(stmt)
    while row:
        tickets.append(Ticket.from_tuple(user, row))
        row = ibm_db.fetch_tuple(stmt)
    return tickets
```

test_app.py

```
test_app.py > -
1 from flask import Flask, render_template, redirect, url_for
2 from types import SimpleNamespace
3
4 app = Flask(__name__)
5
6 user = SimpleNamespace(name="sus")
7
8
9 @app.route("/")
10 def main_page():
11     return redirect(url_for("dashboard"))
12
13
14 @app.route("/register")
15 def register():
16     return render_template("customer_register.html")
17
18
19 @app.route("/login")
20 def login():
21     return render_template("customer_login.html")
22
23
24 @app.route("/logout")
25 def logout():
26     return render_template("logout.html")
27
28
29 @app.route("/dashboard")
30 def dashboard():
31     return render_template("customer_dashboard.html")
32
33
34 @app.route("/agent_dashboard")
35 def agent_dashboard():
36     return render_template("agent_dashboard.html")
37
38
39 @app.route("/chat")
40 def chat():
41     return render_template("chatroom.html", user=user)
42
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43 <div class="text-bold tracking-wide">Tickets Assigned</div>
44 <p class="text-semibold text-gray-500 tracking-wider">
45   {{ticket_stats.assigned}}
46 </p>
47 </div>
48 <div
49   class="flex items-center justify-center flex-col border shadow-md w-48 h-24 bg-gray-100 rounded-2xl"
50 >
51   <div class="text-bold tracking-wide">Tickets Closed</div>
52   <p class="text-semibold text-gray-500 tracking-wider">
53     {{ticket_stats.closed}}
54   </p>
55 </div>
56 <div
57   class="flex items-center justify-center flex-col border shadow-md w-48 h-24 bg-gray-100 rounded-2xl"
58 >
59   <div class="text-bold tracking-wide">Total Tickets</div>
60   <p class="text-semibold text-gray-500 tracking-wider">
61     {{ticket_stats.total}}
62   </p>
63 </div>
64 </div>
65 </div>
66
67 <div class="flex justify-between grow items-center">
68   <h2 class="tracking-wider font-semibold text-2xl">Ticket Table</h2>
69   <!-- Ticket button -->
70   <button
71     class="bg-teal-600 hover:bg-teal-700 text-gray-100 rounded-xl p-3 font-semibold"
72     onclick="window.location.href = '/create_ticket'"
73   >
74     Create New Ticket
75   </button>
76 </div>
77
78 <!-- Ticket Table -->
79 <div class="overflow-x-auto relative">
80   <table class="w-full text-sm text-left text-gray-500">
81     <thead class="text-xs text-gray-700 uppercase bg-gray-200">
82       <tr>
83         <th scope="col" class="py-3 px-6">Ticket ID</th>
84         <th scope="col" class="py-3 px-6">Title</th>
85         <th scope="col" class="py-3 px-6">Status</th>
86         <th scope="col" class="py-3 px-6">Priority</th>
87       </tr>
88     </thead>
89     <tbody>
90       {% for ticket in tickets %}
91       <tr class="bg-white border-b hover:bg-slate-50 cursor-pointer">
92         <th
93           scope="row"
94           class="py-4 px-6 font-medium text-gray-900 whitespace-nowrap"
95         >
96           {{ticket.uid}}
97         </th>
98         <td class="py-4 px-6">{{ticket.title}}</td>
99         <td class="py-4 px-6">{{ticket.status.name}}</td>
100        <td class="py-4 px-6">{{ticket.priority.name |lower}}</td>
101      </tr>
102      {% endfor %}
103    </tbody>
104  </table>
105 </div>
106 </div>
107 </body>
108 </html>
109
```

GitHub Project Link: [IBM-Project-15570-1659600692](#)

Project Demo Link: [Youtube Link](#)