AI-Powered Customer Support Platform

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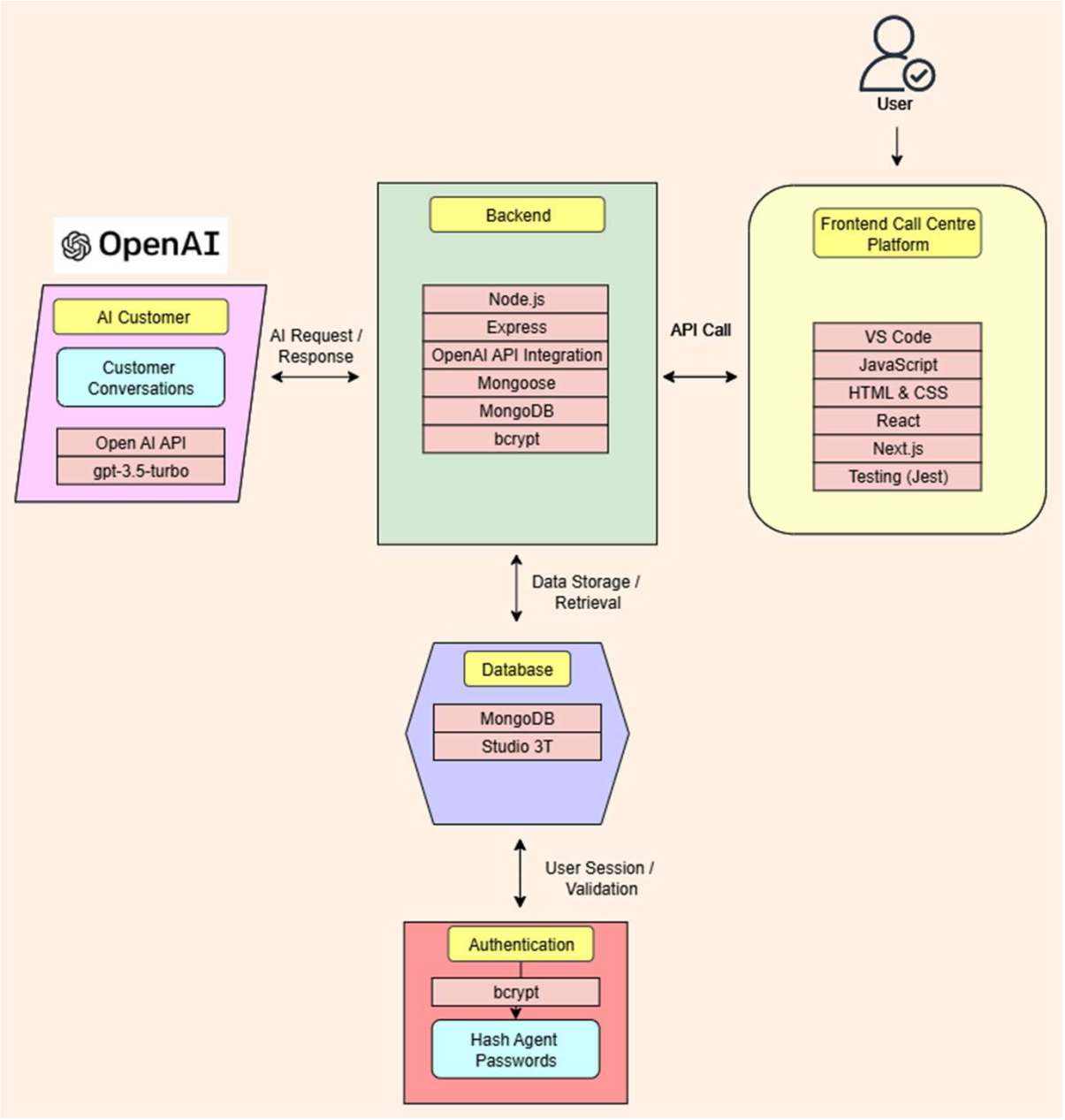
Project Overview

- The platform is an AI-powered customer support tool that helps staff members (agents) manage their work.
- Staff can manage support tickets (CRUD) and create customers.
- The platform uses AI to act as a virtual customer, allowing agents to practise realistic customer support conversations with clients.
- There is an inbox for the customer conversations.
- The system simulates client phone calls and records statistics about them.
- It is developed using modern full stack technologies like React, Next.js, Node.js, and MongoDB for both frontend and backend.
- The platform uses hashed passwords and session management to register and login.
- Agent call activity is stored, and statistics are provided to help improve customer support quality.
- The system makes daily tasks easier and helps agents respond to customer issues more quickly and effectively.
- On the left side menu, there are some useful features like a tutorial page for new agents and a settings section for theme selection.

Architecture Diagram



Features

- Ticket Management (CRUD)
- Ticket Assignment
- Ticket Filtering
- Ticket Details
- Client Creation
- Call Simulation
- Inbox
- OpenAI Integration
- Agent Status
- Authentication
- Tutorial
- RESTful API integration
- Agent Performance Analytics
- On Queue Status
- Dark and light theme support
- Responsive design
- Error handling
- Local storage usage

Technology Stack

Frontend:

- Visual Studio Code
- JavaScript
- React
- Next.js - for routing in the frontend
- HTML & CSS
- Jest – for testing
- Flexbox
- Local storage – for agent status

Backend:

- Node.js – for running the backend server
- Express.js – or building API routes and handling requests
- OpenAI API – for customer interactions
- JSON – for the tutorial
- RESTful API Integration - CRUD

Database:

- MongoDB Compass
- Mongoose – for MongoDB data modelling and queries
- Studio 3T – for data visualisation

Authentication:

- Bcrypt – for password hashing

Features: OpenAI Integration

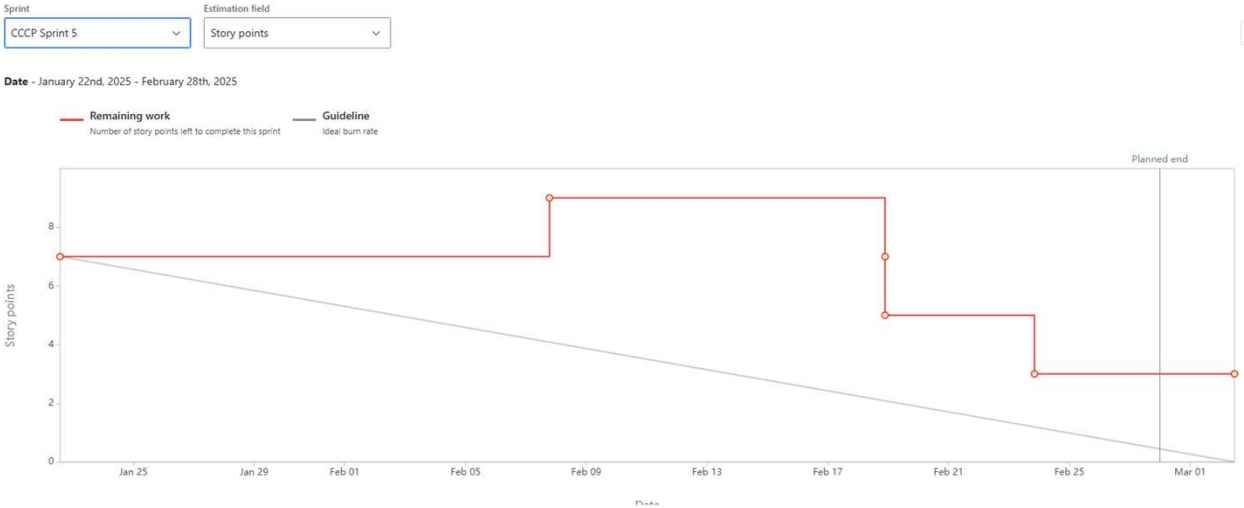
- The OpenAI integration is used to simulate customer replies.
- I used OpenAI's GPT-3.5-turbo model in the backend for the customer chat responses.
- Each customer has a unique persona stored in the database, used as a system prompt for the AI.
- The backend sends the conversation history and persona to the OpenAI API, which returns context-aware replies.
- The API key is securely stored on the backend .env file and never exposed to the frontend.

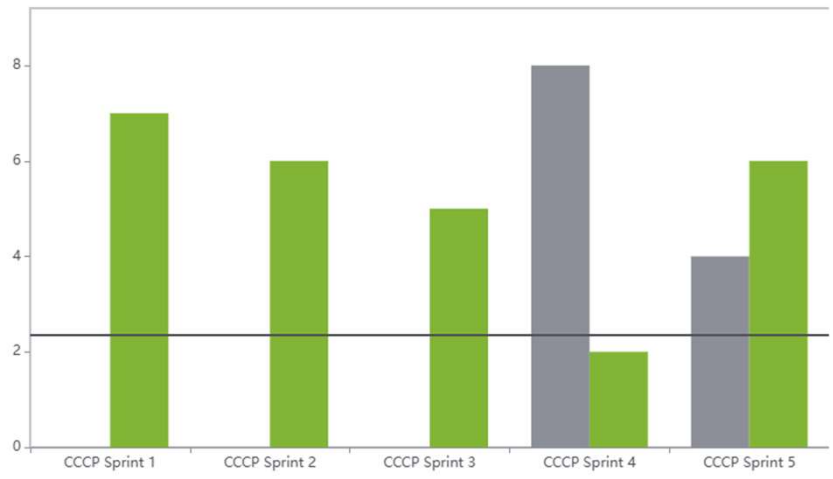
Features: Ticket Management

- Agents can create, view, update, and delete support tickets (CRUD).
- Tickets include details like customer info, issue description, priority, and status.
- Supports ticket assignment to specific agents.
- Allows filtering and sorting tickets by status, priority, or assigned agent.
- All ticket data is stored and managed in the MongoDB database.

Project Management (Jira)

- I used Jira to create monthly sprints and add tickets to track my progress. I moved them across the board depending on their status (to do, on hold, in progress, done).
- I chose Jira because it is what I use at work at Genesys.
- I added weekly OneNote updates to keep track of my progress.





Skills Developed and Learned Lessons

- Project Planning: Learned how to break down a large project into manageable tasks and set realistic deadlines.
- Technical Proficiency: Gained hands-on experience with full stack development, including React, Next.js, Node.js, and MongoDB.
- Database Management: Learned how to structure, query, and visualise data using MongoDB and Studio 3T.
- Working with AI: Developed practical knowledge of integrating and fine-tuning AI models for real-world applications.
- UI/UX Design: Improved skills in creating user-friendly and accessible interfaces.
- Version Control Skills: Improved my ability to use Git and GitHub for tracking changes and collaborating.
- Problem Solving: Developed strategies for debugging, handling unexpected issues, and finding solutions quickly.
- Communication: Practiced explaining technical concepts clearly in documentation and presentations.
- Time Management: Balanced coding and reporting to meet project goals.

Initiative & Engagement

First Semester:

- I had weekly standups with my team (Ciara, Elen, Dan, Mark, Cillian). We added our updates to a shared OneNote notebook.
- I reviewed Parthib and Ciara's proposals, and they reviewed mine. We exchanged feedback and applied it to our proposals.
- I updated my OneNote weekly and recorded videos that I uploaded to YouTube and OneNote.

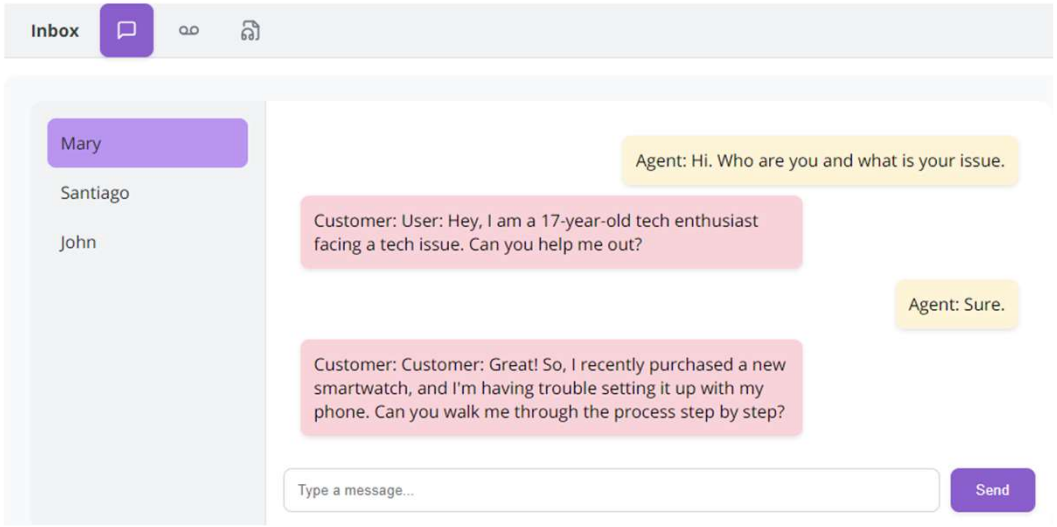
Second Semester:

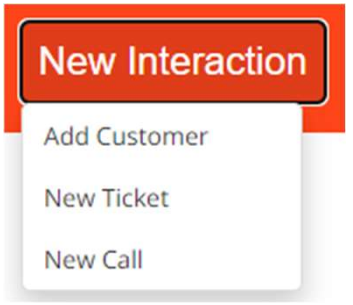
- I continued having weekly standups but with less people, usually one person.
- I continued updating my OneNote.
- I reviewed Parthib's poster, report and presentation.
- Parthib reviewed my poster, report and video.

Research

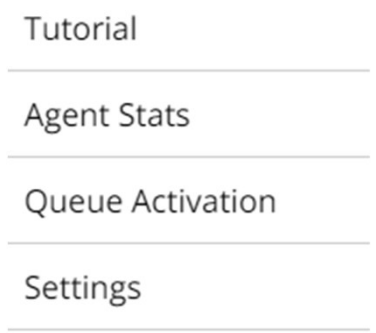
- OpenAI API tutorials for AI-powered conversations
- MongoDB and Mongoose for database management
- Reviewed authentication with bcrypt
- Studied React, Next.js, Node.js, and Express for full stack development

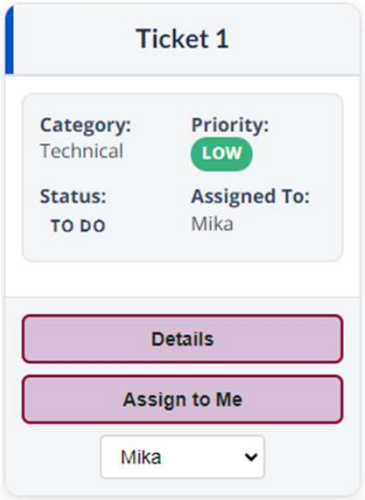
Components

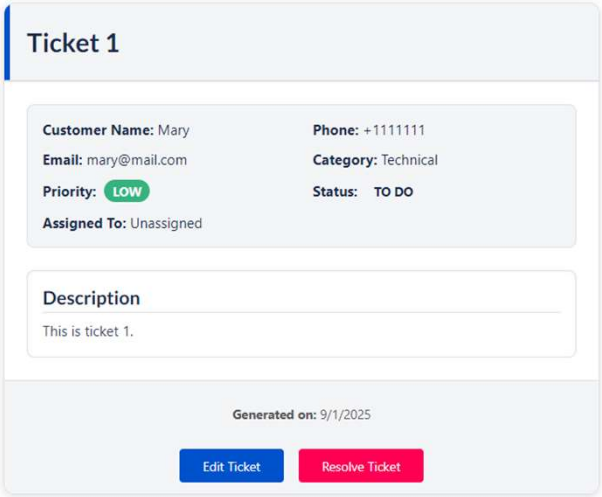

Inbox
Mary
Santiago
John
Agent: Hi. Who are you and what is your issue.
Customer: User: Hey, I am a 17-year-old tech enthusiast facing a tech issue. Can you help me out?
Agent: Sure.
Customer: Customer: Great! So, I recently purchased a new smartwatch, and I'm having trouble setting it up with my phone. Can you walk me through the process step by step?
Type a message...
Send

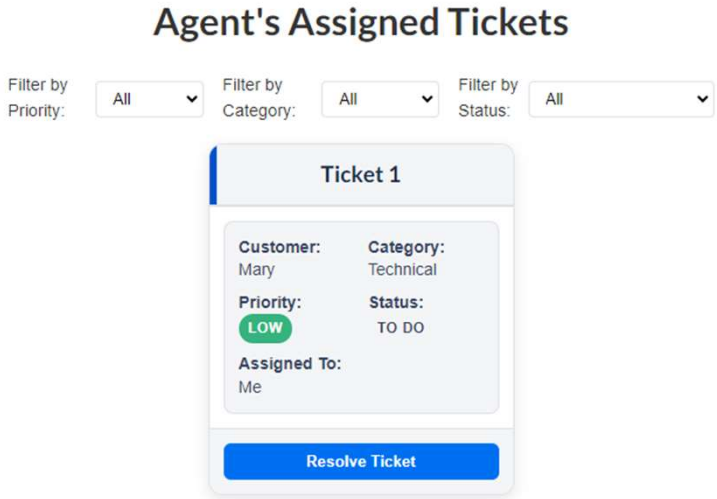

New Interaction
Add Customer
New Ticket
New Call

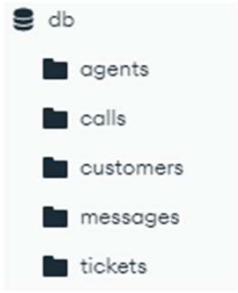

Available
Logged in: Mika
Logout


Tutorial
Agent Stats
Queue Activation
Settings


Ticket 1
Category:
Technical
Priority:
LOW
Status:
TO DO
Assigned To:
Mika
Details
Assign to Me
Mika


Ticket 1
Customer Name: Mary
Phone: +1111111
Email: mary@mail.com
Category: Technical
Priority: LOW
Status: TO DO
Assigned To: Unassigned
Description
This is ticket 1.
Generated on: 9/1/2025
Edit Ticket
Resolve Ticket


Agent's Assigned Tickets
Filter by Priority:
All
Filter by Category:
All
Filter by Status:
All
Ticket 1
Customer:
Mary
Category:
Technical
Priority:
LOW
Status:
TO DO
Assigned To:
Me
Resolve Ticket


db
agents
calls
customers
messages
tickets

Conclusion and Future Improvements

Conclusion:

- I am satisfied with my work doing the ticket management system and the OpenAI customer responses
- I gained valuable experience in full stack development, database usage, and AI integration.

Future Improvements:

- Integrate real phone calls using a service such as Twilio
- Store real call data in the database for analytics
- Host the platform online for wider access
- Use a cloud database like MongoDB Atlas for scalability
- Use an AI Chatbot to help the agent make their work faster and productive.

Thank You For Listening.

Access the YouTube project video here!