

## Problem Statement/Description

HelpDeskPro, LLC (HDP) is a company that manages IT support operations for multiple client businesses across different regions. You have been hired as a Lead Software Engineer and tasked with designing and developing a web-based software solution (enterprise application) that the company will use to manage customer support requests.

The system will be used by an Office Manager to register Support Agents who apply to join the company's workforce. Each Support Agent is given a unique ID number and their First Name, Last Name, Contact Phone Number, Email, and Area of Expertise are recorded in the system.

The Office Manager also uses the system to enroll Customers who require IT support services, including the Customer's First Name, Last Name, Contact Phone Number, Email, and Mailing Address. A Customer can call in to request support or submit a support ticket by filling out an online form on the HDP website.

Upon receiving a support ticket, the system must automatically forward the ticket description to an **AI-powered classification service**, which assigns a **Category** (e.g., Billing, Network Issue, Account Access, Software Bug) and a **Priority Level** (Low, Medium, High). This information is stored with the ticket, and the Office Manager can then assign the ticket to a Support Agent. An email confirmation is sent to the Customer notifying them that their ticket has been received.

Support Agents should be able to sign in to the system and view a listing of all their assigned tickets, including the details of the Customers who submitted them. Agents can update the ticket status (open, in-progress, resolved). The system must ensure that no Agent is assigned more than **10 unresolved tickets** at any time.

Customers should be able to sign in to the system and view the status of their submitted tickets, including details of the assigned Agent. Customers should also be able to request to close their ticket once resolved. A Customer cannot submit a new ticket if they have an outstanding **High Priority unresolved ticket**.

The system should provide Managers with the ability to view analytics reports, such as the number of tickets per category, average resolution time, and ticket trends over time.

## Functional Requirements

1. The system shall allow Customers to register and log in.
2. The system shall allow Support Agents to register and log in.  
The system shall allow Managers to register and log in.
3. The system shall allow Customers to submit new support tickets (title + description).
4. The system shall assign each ticket a unique ID and record its submission date/time.
5. The system shall send ticket descriptions to an external AI service for classification.
6. The system shall receive the category and priority level from the AI service and store them with the ticket.
7. The system shall allow Customers to view the status and details of their submitted tickets.
8. The system shall prevent Customers from submitting a new ticket if they have an unresolved **High Priority** ticket.
9. The system shall allow Agents to view a list of tickets assigned to them.
10. The system shall allow Agents to filter tickets by category, priority, and status (open/resolved).
11. The system shall allow Agents to update the status of a ticket (e.g., open → resolved).
12. The system shall prevent Agents from having more than **10 unresolved tickets** assigned at any given time.
13. The system shall allow Managers to view all tickets in the system.
14. The system shall provide role-based access (Customer, Agent, Manager) to restrict functionality.
15. The system shall allow Managers to assign tickets manually to agents.