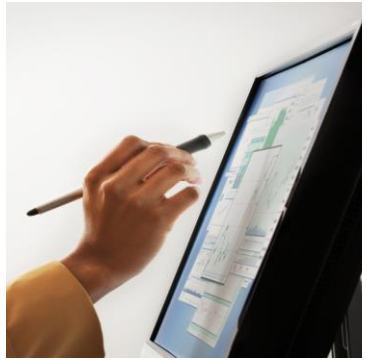
AI-Powered Ticket Management System

Automating ticket handling for enhanced customer service

Problem Statement

Manual Ticket Classification

Manual sorting of tickets is slow and inconsistent, causing delays in issue resolution.



Limited Ticket Visibility

Customers often cannot see the status of their tickets, leading to frustration and repeated follow-ups.

Lack of Automated Prioritization

No automation for workload management or ticket prioritization causes delays in handling urgent issues.

Project Objective

Intelligent Ticket Automation

Automate ticket categorization and prioritization using AI to improve efficiency and accuracy in support processes.

Role-Based User Interaction

Enhance communication and operations among Customers, Agents, and Managers with role-specific system features.

Real-Time Status Visibility

Provide up-to-date visibility into ticket statuses to ensure timely responses and better workload management.

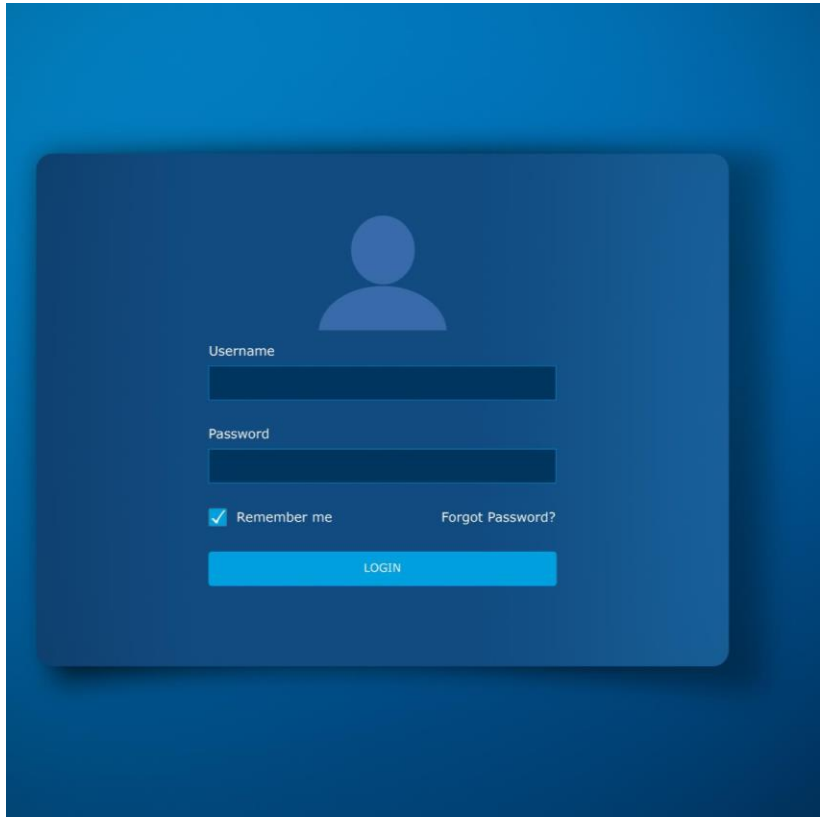
Business Rule Enforcement

Implement rules like blocking new high-priority tickets when unresolved ones exist to maintain workflow balance.

System Users & Roles

ROLE	CAPABILITIES
Customer	Register, log in, create/view tickets, restricted by unresolved high-priority rule.
Agent	View assigned tickets, filter/search, update ticket status.
Manager	View all tickets, assign agents, oversee activity.

Core Functionalities



User Registration and Login

Supports secure access for Customers, Agents, and Managers through dedicated registration and login features.

Ticket Creation and Tracking

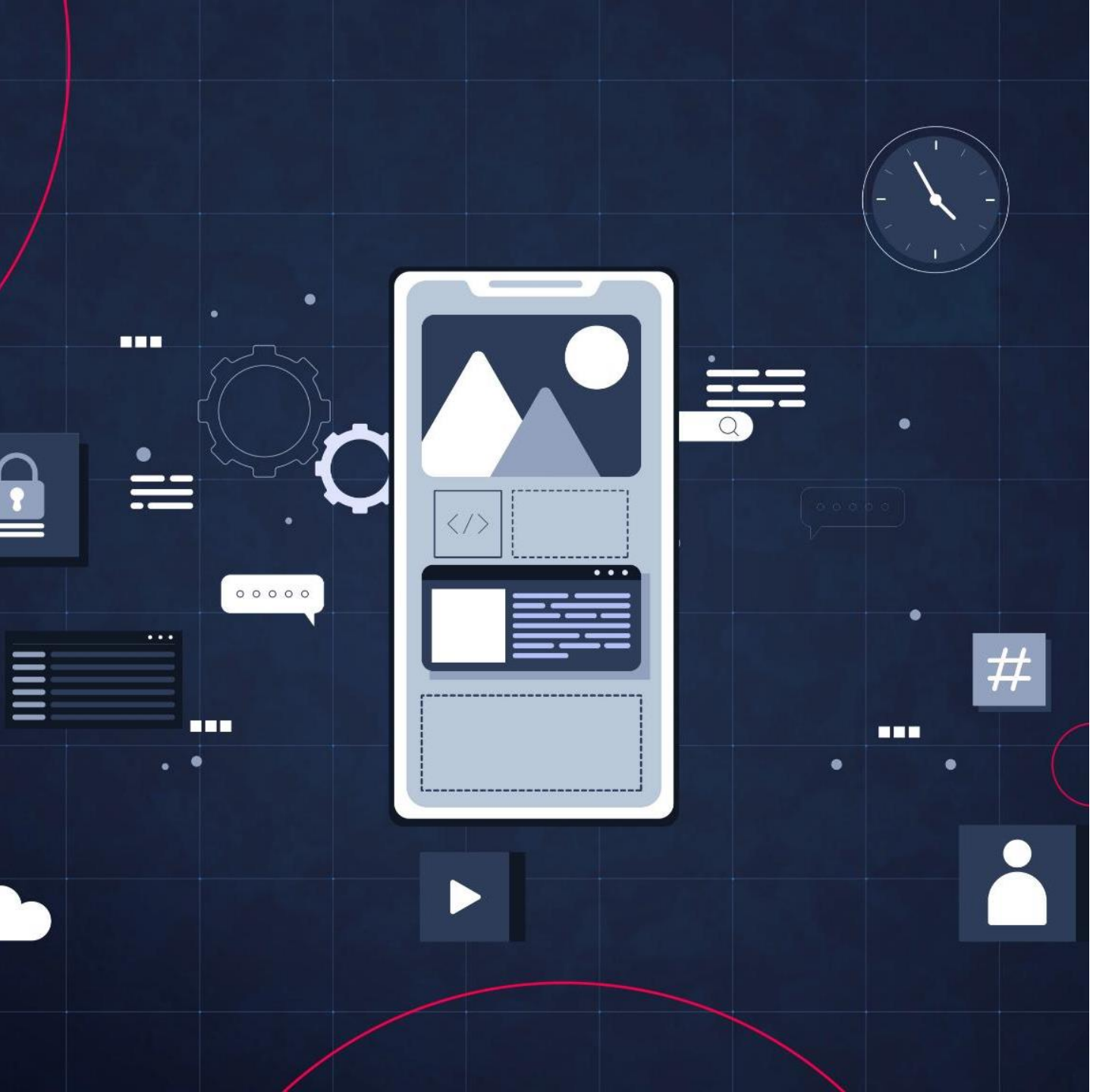
Users submit issues with titles and descriptions, automatically assigned unique IDs and timestamps for tracking.

AI-Based Categorization and Prioritization

AI categorizes tickets and detects priorities to enhance efficient triage and handling of issues.

Role-Based Access Control

RBAC ensures users perform only allowed actions based on their roles, enhancing system security and control.



AI Integration Flow

Ticket Submission and AI Processing

Customer tickets are submitted and sent to an external AI service for classification and priority scoring.

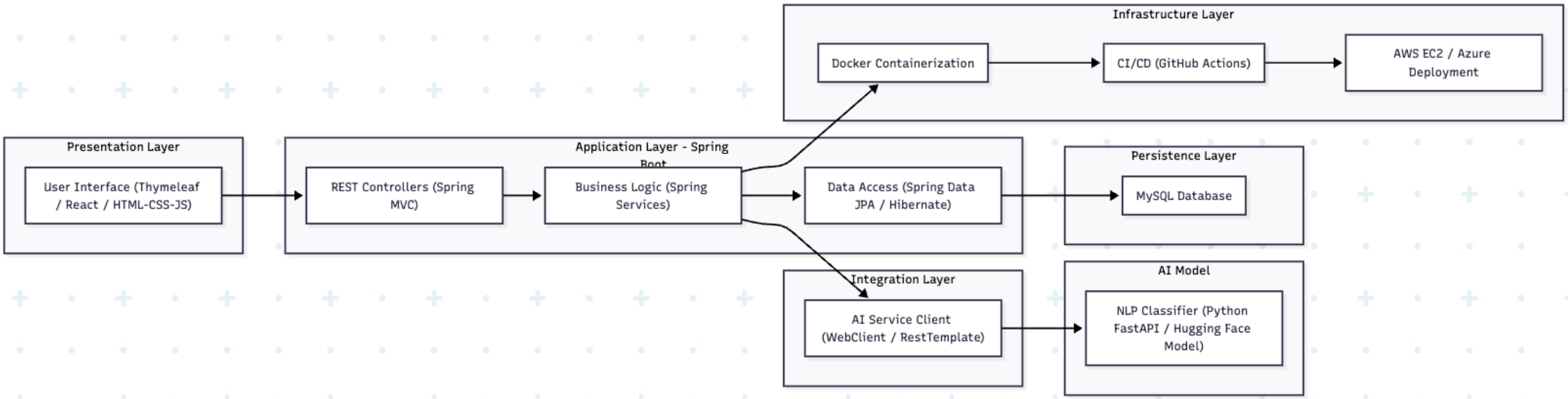
Backend Integration Technologies

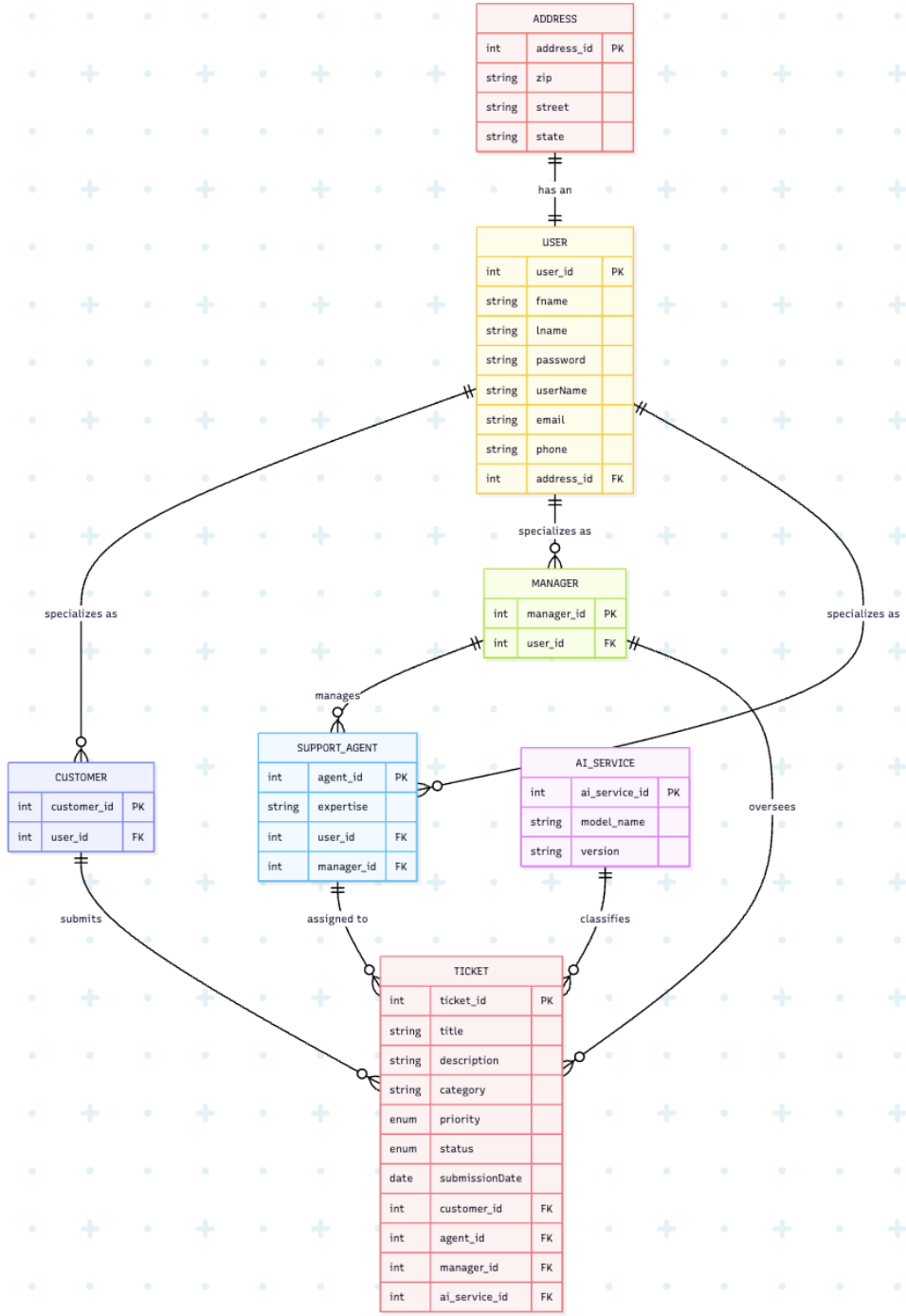
Integration uses Spring Boot and WebClient for API calls and JSON parsing for response handling.

Data Storage and Automation

Processed ticket data is stored in MySQL, enabling automated and accurate ticket classification.

System Architecture Diagram




ADDRESS
int address_id PK
string zip
string street
string state
has an
USER
int user_id PK
string fname
string lname
string password
string userName
string email
string phone
int address_id FK
specializes as
MANAGER
int manager_id PK
int user_id FK
specializes as
specializes as
manages
CUSTOMER
int customer_id PK
int user_id FK
SUPPORT_AGENT
int agent_id PK
string expertise
int user_id FK
int manager_id FK
AI_SERVICE
int ai_service_id PK
string model_name
string version
oversees
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TICKET
int ticket_id PK
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string description
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enum priority
enum status
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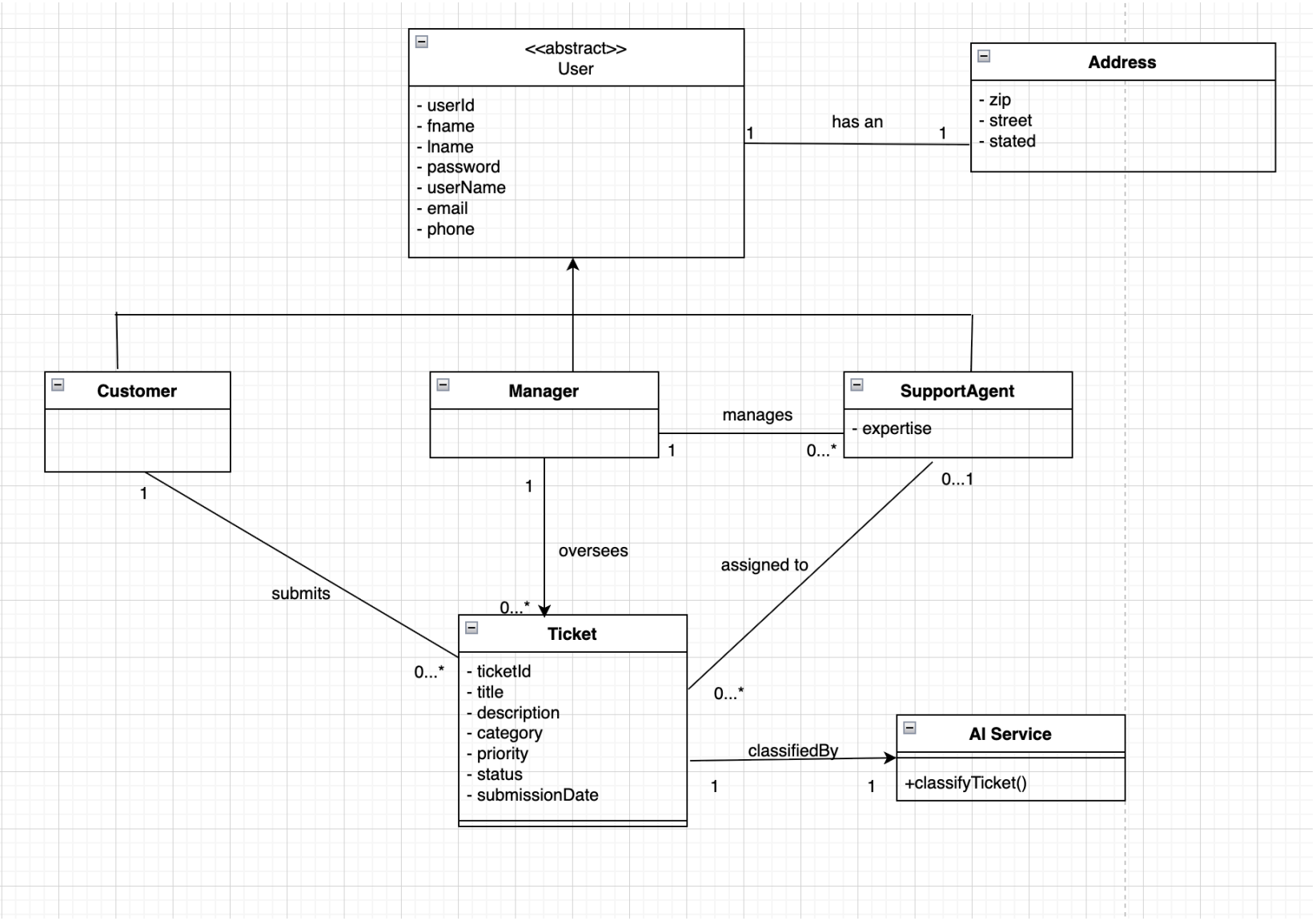
int customer_id FK
int agent_id FK
int manager_id FK
int ai_service_id FK

E-R Diagram


<<abstract>>
User
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- fname
- lname
- password
- userName
- email
- phone
Address
- zip
- street
- stated
1
has an
1
Customer
Manager
SupportAgent
- expertise
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oversees
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submits
0...*
Ticket
- ticketId
- title
- description
- category
- priority
- status
- submissionDate
0...*
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classifiedBy
1
1
AI Service
+classifyTicket()

UML Diagram

Technologies Used

LAYER	TECHNOLOGY
Backend	Java Spring Boot
Frontend	React – Future Work
Database	MySQL
AI Integration	Hugging Face Inference API
Authentication	Spring Security (JWT)
API Testing	Postman
Deployment	Docker / Maven build

Future Enhancements

AI Model Fine-tuning

Fine-tuning the AI model improves ticket categorization accuracy and system reliability.

Real-time Notifications

Integrating email and SMS notifications keeps users updated on ticket statuses instantly.

Analytics Dashboard

An analytics dashboard provides managers insights on ticket trends, agent performance, and usage.

Multi-language Support

Multi-language support expands accessibility to a global user base across diverse environments.