**Service Management System**

**1. Overview**

The system is designed to manage post-sales service requests for machinery products sold by the company. Customers can raise tickets for product issues, which will be assigned to service engineers by service heads. The system manages the process from issue reporting to resolution, including repair tracking, prioritization, reporting, and travel expense management for service engineers. Additionally, if spare parts are required, they are issued in the name of the customer.

**Tools and Technologies**

* **Backend Framework**: Python, FastAPI
* **Database**: MySQL
* **ORM**: SQLAlchemy

**2. User Types**

**Admin**

* Add and manage Service Heads and Service Engineers.
* Assign Service Engineers to Service Heads.

**Service Head**

* View tickets raised by customers.
* Assign tickets to Service Engineers.
* Approve travel expense reports submitted by Service Engineers.

**Service Engineer**

* View assigned tickets with customer contact and location information.
* Contact the customer, assess the issue, and set ticket priority.
* Request and issue spare parts in the name of the customer if needed.
* Record actions, set expected resolution date, and provide daily progress updates.
* Submit travel expense reports with bills for refund approval.

**3. Features & Functionalities**

**Ticket Management**

* **Customer Ticket Submission**: Customers can raise a service ticket in two ways:
  1. **Direct Call**: Customer calls and a service entry is made on their behalf.
  2. **User Portal**: Customers can raise tickets through a dedicated online portal.
* **Ticket Workflow**:
  1. The Service Engineer investigates the issue and updates the system with:
     + **Priority**: Set by the engineer based on the severity of the issue.
     + **Expected Completion Date**: Estimate for issue resolution.
     + **Cost**: Calculated based on repair work (if under warranty, no service charges apply, but additional costs like oil service are recorded).
     + **Spare Parts Issuance**: If spare parts are required to resolve the issue, they are issued in the name of the customer.
     + **Actual Completion Date**: Entered when the issue is resolved.
* **Daily Progress Updates**:
  1. The Service Engineer provides daily reports to the Service Head on ticket progress.
  2. If a report is missed for the previous day, the system will prompt for the submission of past updates.

**Travel Expense Report Management**

* **Personal Expense Tracking**:
  + Service Engineers cover travel costs initially (hotel, food, transportation, etc.).
* **Expense Refund Process**:
  + Engineers submit expenses through the system (e.g., petrol charges, bus fare, hotel bills).
  + The Service Head reviews and approves/refuses the expenses for a refund.

**4. Reports and Dashboards**

**Admin Dashboard:**

* View a monthly overview of raised, resolved, and ongoing tickets.
* Employee count and assignment status.

**Employee Report:**

* Track daily processes.
* View ticket completion times.
* Count of solved tickets.
* Status of current tickets.

**Service Report:**

* **Details**: Ticket raised date, service head view date, service engineer arrival date.
* **Metrics**: Time taken to complete tasks, total ticket cost, and any spare parts used.

**Service Head Report:**

* Team member count and ticket distribution.
* Number of tickets assigned, completed, and in progress.

**5. Future Expansion**

* Possibility of introducing new user roles.