Project Documentation: Supplier Management System

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1. Project Overview

The Supplier Management System is a Spring Boot application designed to manage supplier details such as company name, website, location, nature of business, and manufacturing processes. The system allows for the creation of new suppliers and querying existing suppliers based on specific criteria like location, business nature, and manufacturing capabilities.

Key Features:

- **Create Supplier:** Add new suppliers with details like location, nature of business, and manufacturing processes.
- **Query Suppliers:** Retrieve suppliers based on location, business type, and manufacturing process.

2. Technologies Used

- **Spring Boot**: For building the RESTful API.
- **PostgreSQL**: Database management system to store supplier data.
- **Spring Data JPA**: For database interaction and ORM.
- **Maven**: For project management and build automation.
- **Java 17**: Programming language used for the project.

3.Entity Design

Supplier Entity

The `Supplier` entity represents the supplier details and includes fields like `supplierId`, `companyName`, `website`, `location`, `natureOfBusiness`, and `manufacturingProcesses`.

Enum Classes

NatureOfBusiness.java

```
public enum NatureOfBusiness {
    SMALL_SCALE,
    MEDIUM_SCALE,
    LARGE_SCALE;
}
```

ManufacturingProcess.java

```
public enum ManufacturingProcess {
    MOULDING,
    _3D_PRINTING,
    CASTING,
    COATING;
}
```

5. Database Configuration

PostgreSQL Configuration

In the `application.properties` file, PostgreSQL configurations are specified:

Database Schema

The schema is auto-generated by Hibernate based on the entity classes. The `Supplier` table and `supplier_processes` collection table are created in PostgreSQL.

Supplier Table Schema

The `Supplier` entity is mapped to a table in the database with the following columns:

- `supplier_id` (Primary Key)
- `company_name`
- `website`
- `location`
- `nature_of_business`
- `manufacturing_processes` (Stored as a set of enum values)

6. API Endpoints

i)Create Supplier

Endpoint: `/api/supplier/create`

Method: `POST`

Description: Creates a new supplier.

Request Payload:

```
{
    "companyName": "Example Company",
    "website": "http://example.com",
    "location": "India",
    "natureOfBusiness": "SMALL_SCALE",
    "manufacturingProcesses": "MOULDING"
}
```

Response:

- `201 Created` with the created supplier details.

ii)Query Suppliers

Endpoint: `/api/supplier/query`

Method: `POST`

Description: Retrieves a list of suppliers based on the location, nature of business, and manufacturing processes.

Parameters:

- `location` (String): The city of the supplier.
- `natureofbusiness` (Enum): The scale of the business.
- `manufacturingProcess` (Enum): The manufacturing process capability.
- `limit` (int): The maximum number of suppliers to return.

Response:

- `200 OK` with a list of suppliers matching the criteria.


```
[
  {
    "supplier_id": 2,
    "company_name": "ABC Manufacturing Co.",
    "website": "https://www.abcmanufacturing.com",
    "location": "India",
    "natureofbusiness": "MEDIUM_SCALE",
    "manufacturingProcess": "MOULDING"
  }
]
```

Error Handling

The application includes basic error handling for invalid data and database errors. Common exceptions include:

- `MethodArgumentTypeMismatchException`: Occurs if an incorrect enum value is passed in the query.
- `IdentifierGenerationException`: Occurs if a supplier ID is not provided during creation.

Conclusion

The Supplier Management System is a robust application for managing and querying supplier data. With its flexible querying capabilities, it allows for efficient management of suppliers based on their location, nature of business, and manufacturing processes. The system is built on Spring Boot and PostgreSQL, offering a scalable solution for supplier management.