Writeup-1:

**Project Abstract of - Material Inspection Module Application:**

The aim of this application is to provide functionality to capture and process data related to material inspection which is an important part of material procurement in a manufacturing industry:

Master Data processed by the application includes Vendor, Plant, Material, Material Inspection Characteristics. User master data was populated through backend.

Transaction Data processed by the application:

1. Creation of “Inspection Lot”, maintenance of inspection lot status.
2. Capturing the actual measures of inspection for varied inspection characteristics of different materials/goods and the comparison of actuals with standard tolerance limits.

*Search Functionality:* The application user will be able to search for Inspection Lot data by Lot ID, Inspection lot creation date range, material id, vendor id, plant id and/or Inspection Status.

**Business Domain information related to Material Inspection:**

1. *External Requirement:* A material vendor issues a *Delivery Note* after delivering the goods for a Purchase Order indicating the quantity and type of goods. The receiving enterprise will have to conduct inspection of the materials and issue a *Goods Receipt* to the vendor indicating the quantity and type of goods that the enterprise is accepting for meeting the required standards.
2. *Internal Requirement:* Materials will have to be issued to the production/manufacturing department only after thorough inspection and the related data captured in the system.

**Tech Stack:** PostgreSQL, Java, Spring MVC and Spring Boot, JSP/JSTL, Apache Tomcat

Writeup-2:

**Project Abstract of - Material Inspection Module Application:**

Material Inspection is an important activity that is performed as part of the procurement process to ensure the materials delivered by the vendor meets the buyer organization's required standards as per quantity and quality requirements based on various characteristics for each material.

This application provides features to process the master data and transaction data related to inspection of materials which include Vendor, Plant, Material and Material Characteristics as master data. User master data was populated through backend. The transactions include Creation & Status assignment of Inspection Lots and capturing the actual measurements during inspection and their comparison with the predefined standard tolerance limits.

The application also provides a search functionality for Inspection Lots based of input parameters like Lot ID, Lot Creation Date, Inspection Status, Vendor and Plant. Through the search results the user will be able to view the inspection results, actuals and set the inspection lot status.

Business Domain Importance: As part of the material procurement by any manufacturing company once the vendor supplies the materials as per Purchase Order and provides a Delivery Note for the delivery the buying company must perform inspection of the received materials for quality and quantity. Based on the inspection data the buyer will have to accept the materials that meet the required standards and issue a Goods Receipt to the vendor. Inspection of materials is also a prerequisite to issue quality material to the Production Department.

**Tech Stack:** PostgreSQL, Java, Spring MVC and Spring Boot, JSP/JSTL, Apache Tomcat

Writeup-3:

**Project Abstract of - Material Inspection Module:**

Inspection of materials and capturing the related data is an important activity of the procurement process in a manufacturing industry. This is a pre-requisite to issue Goods Receipt to the vendor and to ensure that material issued to the production department meets the required standards of quantity and quality.

This application captures and process data related to Vendors, Plants, Materials and Material Characteristics as part of the master data management, and Inspection Lot and Inspection Actuals as transaction data. User master data was populated through backend.

Up on capturing the actuals for all the material characteristics for a given material related to an inspection lot if all the actuals are within the standard tolerance limits the lot status is set to ‘Pass’ by the system. In the event of any discrepancies in the actual measurements as compared to the standard tolerance limits the lot status is set as ‘On Hold’ by the system and requires manual intervention by an application user to review the inspection actuals and set the lot status to “Pass” or “Fail” explicitly.

A search functionality for viewing and processing inspection lot is an integral part of this application.

**Tech Stack:** PostgreSQL, Java, Spring MVC and Spring Boot, JSP/JSTL, Apache Tomcat

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| **Additional info:**  Delivery Note:  When goods/materials are being handed over by a vendor the vendor company will issue a document called “Delivery Note”. This document will contain information such as the sender's and recipient's contact information, the date and time of delivery, a description of the items being delivered, the quantity of each item. (A Delivery Note document is also referred to as Delivery Receipt or Packaging Slip.)  The delivery note serves as proof that the goods have been delivered by the vendor to the buyer.  Goods Receipt:  Goods Receipt is a document issued by the buyer to the vendor indicating the acceptance of the goods/materials of the delivered goods that meet the buyer’s standards thereby indicating rejections if any.  The vendor company will have to raise an invoice only for the quantity of the materials that has been specified by the buyer company in its GR document and not for the quantity as specified in the Delivery Note. |

Questions that I would ask if I were the interviewer:

What was the challenging part of this application development for you?

How many database tables were required for this application and what were they?

How many fields/columns were present in each of these tables?

For example:

What were the columns of Vendor table?

What were the columns of Material Characteristics table?

What were the columns of Inspection Lot table?

What were the columns of Inspection Actuals table?

Explain how the different tables in the application’s data model were related to each other?

What were the different validations you had to implement?

Were any authorization features implemented as part of this application?

In which scenarios of the application pagination was required? How did you implement it?

[It is a blunder to say pagination was not required for this application. There are many areas in this application where pagination is applicable. More importantly Inspection Lot Search results has to be mandatorily implanted with pagination.]

Explain the view of one JSP (say Material or Inspection Lot) and to explain the mandatory fields and validations related to that view. It is not just about what were the validations, but also about how the validation was implemented, and processing logic related to how the error message was displayed.

Explain the views related to input parameters and the search result output for Inspection Lot search. Explain the logic involved in Controller, Service and Repository layers for this search functionality.

You could be asked questions related to HTML, CSS, JavaScript that you had to use to develop this application.

Of course, there will be questions related to Spring MVC, Spring Boot & Logging related to application tier code.

Note that few validations like mandatory fields, regex and max value being greater than min value can be done in the frontend with Java Script. But validation for already existing Plant ID, Plant Name, Material ID, Material Description can be done only in the controller.

The advantage of doing a validation in JSP with JavaScript is that it doesn’t require a round trip from presentation tier to application tier. The disadvantage is that if we handle, we validation in frontend and few in backed (controller) then there will be NO consistency in the way error messages are displayed to the end user.

**Validations:**

1. Plant ID and Material ID were external IDs which the application users have to input. These IDs were alpha-numeric data with only one special character hyphen to be allowed. Other special characters were to be restricted. [regex could be implemented in Java controller or in Java Script – each has its advantages and disadvantages]
2. Email ID and Contact Number of Vendor [regex]
3. While creating a new Plant if the input plant ID already existed in the database an error message had to be generated. Same was the case with material id.
4. While creating a material if a material with the same description (in a case insensitive way) already existed in the database – an error message had to be generated. The same was the case with plant name, vendor name and material characteristic description.
5. While creating a material characteristic if the max tolerance limit was less than the min tolerance limit an error message had to be displayed.
6. When a user manually sets the inspection status of lot was mandatory to provide remarks.
7. The end date of an inspection cannot be captured until the input was captured for all the actuals for the inspection characteristics of the material related to the inspection lot.
8. The difference between the start date and end date of inspection lot creation date for implementing the search functionality should be limited to a maximum of 90 days.

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| CREATE TABLE vendor\_master (  vendor\_id INT PRIMARY KEY,  vendor\_name VARCHAR(60) NOT NULL,  addr\_line1 VARCHAR(125),  addr\_line2 VARCHAR(125),  city VARCHAR(25),  country VARCHAR(2),  contact\_person VARCHAR(60),  phone\_number VARCHAR(15),  email\_address VARCHAR(50),  payment\_terms VARCHAR(50),  credit\_limit DECIMAL(10, 2),  credit\_currency VARCHAR(3),  tax\_id VARCHAR(20),  bank\_name VARCHAR(30),  bank\_branch VARCHAR(25),  bank\_ac\_number VARCHAR(20)  );  Payment terms refer to the agreed-upon conditions between a buyer and a seller for payment of goods or services. These terms specify the timeframe within which the payment is expected, as well as any discounts or penalties that may apply based on the payment schedule.  For example, a payment term of "Net 30" means that the buyer is expected to pay the full amount within 30 days from the date of invoice. A payment term of "2/10 Net 30" means that the buyer can receive a 2% discount if they pay within 10 days of the invoice date, but the full amount is due within 30 days regardless of whether or not they take the discount.  Payment terms are important for both buyers and sellers as they help to ensure that transactions are completed in a timely and efficient manner while also providing clarity around payment expectations.  Plant: Plant\_ID, Plant\_Name, Location, Contact\_person, Contact\_Phone\_Num, Contact\_email  Material: Mat\_ID, Mat\_Desc, Mat\_Type, UoM |