Re Plastic Innovations - Transforming Plastic Waste into Sustainable Solutions

1. Abstract

This document outlines the development and implementation of a Salesforce-based solution for "Re Plastic Innovations." The project's primary goal is to streamline the management of plastic waste, from collection and recycling processes to the inventory and sales of recycled products. Utilizing Salesforce's robust platform, this solution integrates custom data models, enhanced user interfaces, comprehensive security measures, and advanced automation using both declarative (Flow Builder) and programmatic (Apex) capabilities to provide an efficient and scalable system for sustainable operations.

2. Objective

The main objectives of this Salesforce project are to:

- **Centralize Data Management:** Provide a unified platform for tracking all aspects of plastic waste, recycling operations, recycled product inventory, customer orders, and restock requests.

- **Improve Operational Efficiency:** Automate key business processes such as inventory updates, restock request generation, and task assignments.

- **Enhance Data Quality and Integrity:** Implement validation rules and formula fields to ensure accurate and meaningful data entry and display.

- **Ensure Data Security and Access Control:** Implement a robust security model using roles, profiles, and sharing rules to control user access to sensitive information.

- **Provide a User-Friendly Interface:** Develop a custom Lightning App with dedicated tabs for easy navigation and interaction with relevant data.

- **Lay the Foundation for Scalability:** Build a flexible solution that can be extended with future enhancements.

3. Technology Description

This project leverages various core Salesforce platform features to build a comprehensive solution:

- **Custom Objects:** Custom objects are database tables used to store specific business data, such as Plastic Waste, Recycling Centres, Recycled Products, Orders, and Restock Requests.

- **Custom Tabs:** Salesforce navigation bar elements are user interface components that display custom objects, allowing users to directly navigate and interact with their records.

- **Custom App (Lightning App):** The workspace is designed to provide a cohesive user experience by grouping relevant tabs, items, and utilities for specific user roles.

- **Sharing Rules:** Define exceptions to OWDs, extending record access to specific groups of users based on criteria or ownership.

- **Flow Builder:** Salesforce's declarative automation tool enables the creation, modification, and deletion of records, enabling complex logic without the need for written code.

- **Developer Console:** Salesforce's IDE is a tool used for writing, debugging, and testing Apex code, Visualforce pages, and other programmatic components.

4. Detailed Execution of Project

The project was executed in a step-by-step manner, building foundational elements before moving to advanced functionalities.

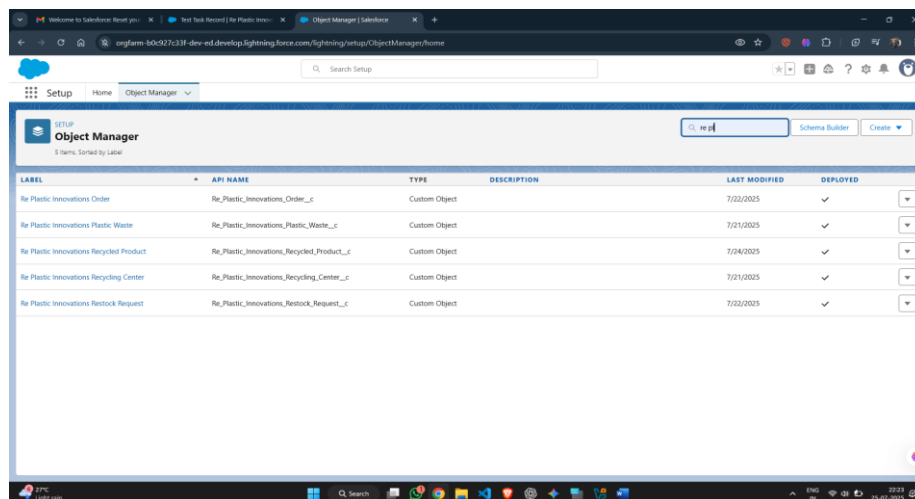**Salesforce Credentials Setup**

- A Salesforce Developer Org was created to serve as the development environment. This involved signing up at developer.salesforce.com/signup and providing basic contact and company details.
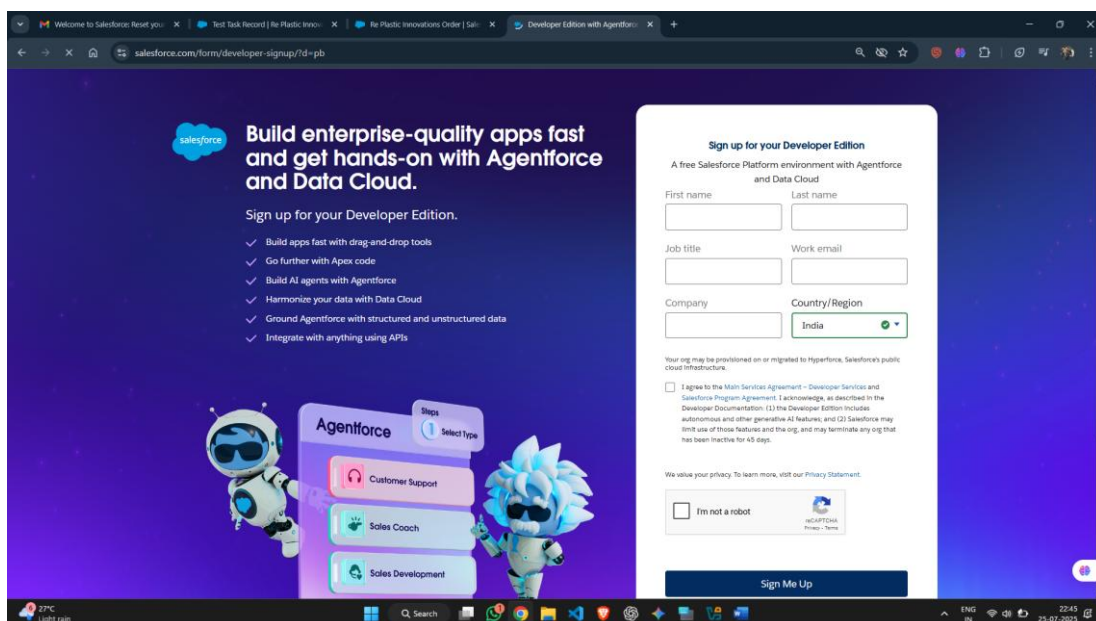
Data Management - Objects

The following custom objects were created to model the core entities of the Re Plastic Innovations business:

- **Re Plastic Innovations Plastic Waste (Re_Plastic_Innovations_Plastic_Waste__c):** To track collected plastic waste.

- **Re Plastic Innovations Recycling Center (Re_Plastic_Innovations_Recycling_Center__c):** To manage details of recycling facilities.

- **Re Plastic Innovations Recycled Product (Re_Plastic_Innovations_Recycled_Product__c):** To manage inventory of products made from recycled materials.

- **Re Plastic Innovations Order (Re_Plastic_Innovations_Order__c):** To record customer orders for recycled products.

- **Re Plastic Innovations Restock Request (Re_Plastic_Innovations_Restock_Request__c):** To manage requests for replenishing recycled product stock.

Data Management - Tabs

Custom tabs were created for each custom object to offer a user-friendly navigation and record access interface within the Salesforce UI.
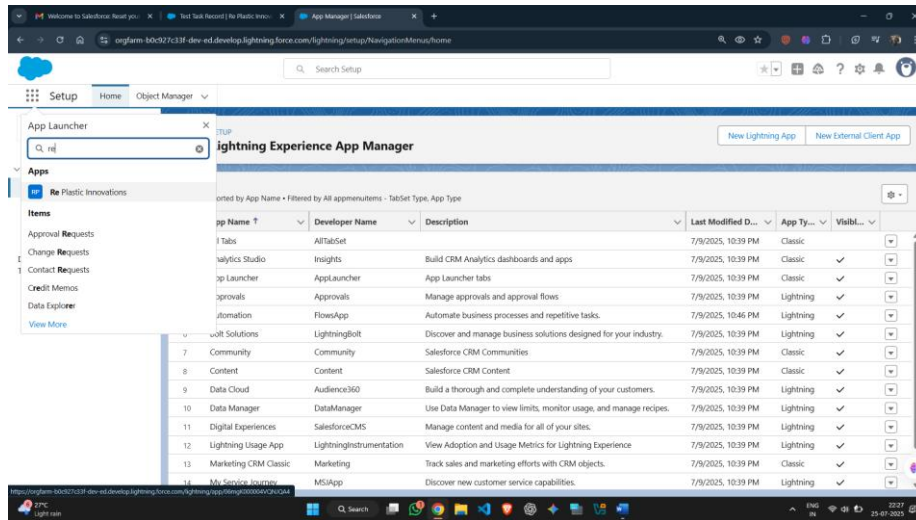
Data Management - App Manager

Re Plastic Innovations is a custom Lightning App that streamlines user experience by grouping custom object tabs like Plastic Waste, Recycling Centers, and Recycled Products.

Data Management - Fields

Custom fields were created for each object, ensuring appropriate data types, lengths, decimal places, and relationships, including Lookup fields.

- Plastic Waste: Weight (Number), Type (Picklist), Collection Date (Date), Status (Picklist), Location (Geolocation), Recycling Center (Lookup).

- Recycling Center: Location (Geolocation), Capacity (Number).

- Recycled Product: Stock Level (Number), Threshold (Number), Price (Currency).

- Order: Customer (Lookup to Account), Recycled Product (Lookup), Quantity (Number), Delivery Date (Date).

- Restock Request: Product (Lookup), Requested Quantity (Number), Status (Picklist).
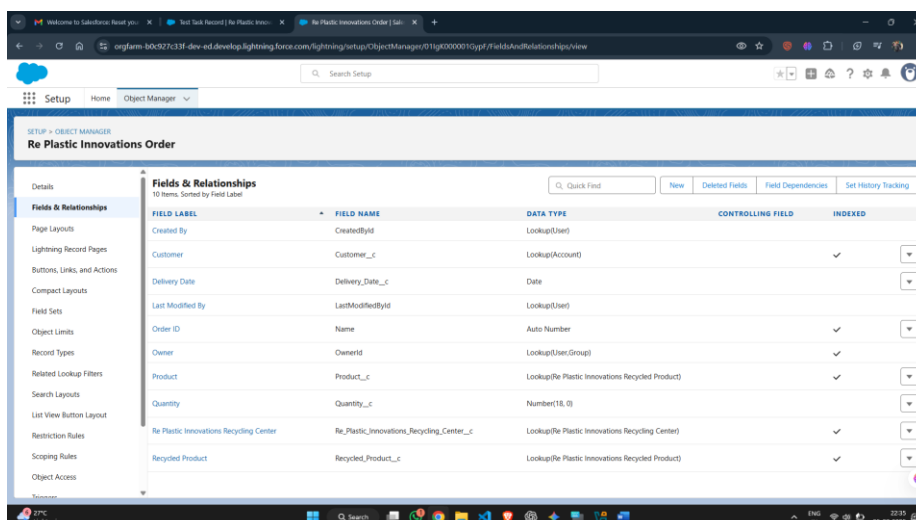
Data Security - Roles

A role hierarchy was established to define reporting structure and data visibility:

- **CEO** (Top-level)

- **Recycling Manager** (Reports to CEO)

- **Sales Representative** (Reports to CEO)

- **Warehouse Supervisor** (Reports to Sales Representative)
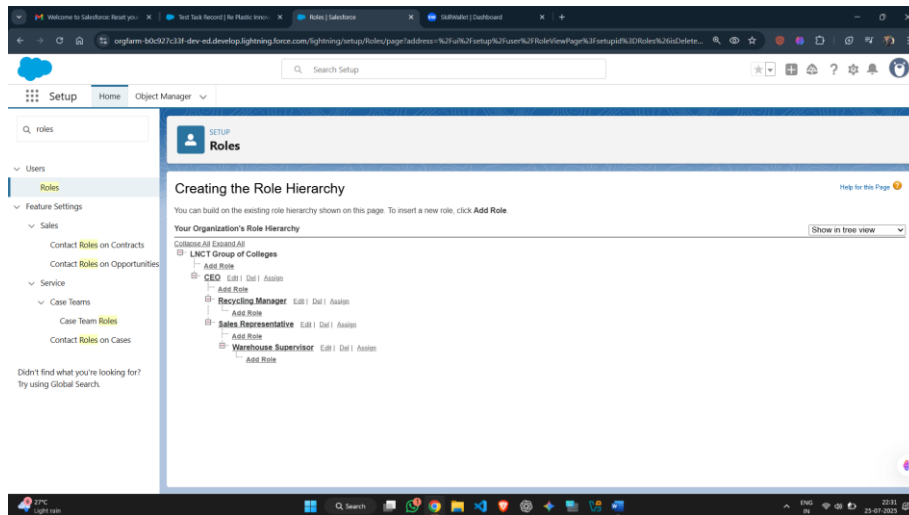
Data Security - Profiles

Three custom profiles were created by cloning the Standard Platform User profile to control object and field-level permissions:

- **Platform 1:** Granted Read/Create access to Re Plastic Innovations Plastic Waste and Read-Only access to Re Plastic Innovations Restock Request.

- **Platform 2:** Granted Read/Create access to Re Plastic Innovations Order and Account, and Read-Only access to Re Plastic Innovations Plastic Waste and Re Plastic Innovations Recycled Product.

- **Platform 3:** Granted Read/Create/Edit access to all custom objects (Re Plastic Innovations Plastic Waste, Recycling Center, Recycled Product, Order, Restock Request).

Data Security - Users

Three new users were created and assigned to specific roles and profiles:

- **John Production Engineer:** Assigned to **Role: Recycling Manager**, **Profile: Platform 1**.

- **Quality Inspector Mike:** Assigned to **Role: Sales Representative**, **Profile: Platform 2**.

- Plant Manager Albert: Assigned to Role: Warehouse Supervisor, Profile: Platform 3.

(Each user's password was set via email verification after creation.)

Data Security - Record Level Security

Organization-Wide Defaults (OWDs) and Sharing Rules were implemented to fine-tune record visibility:
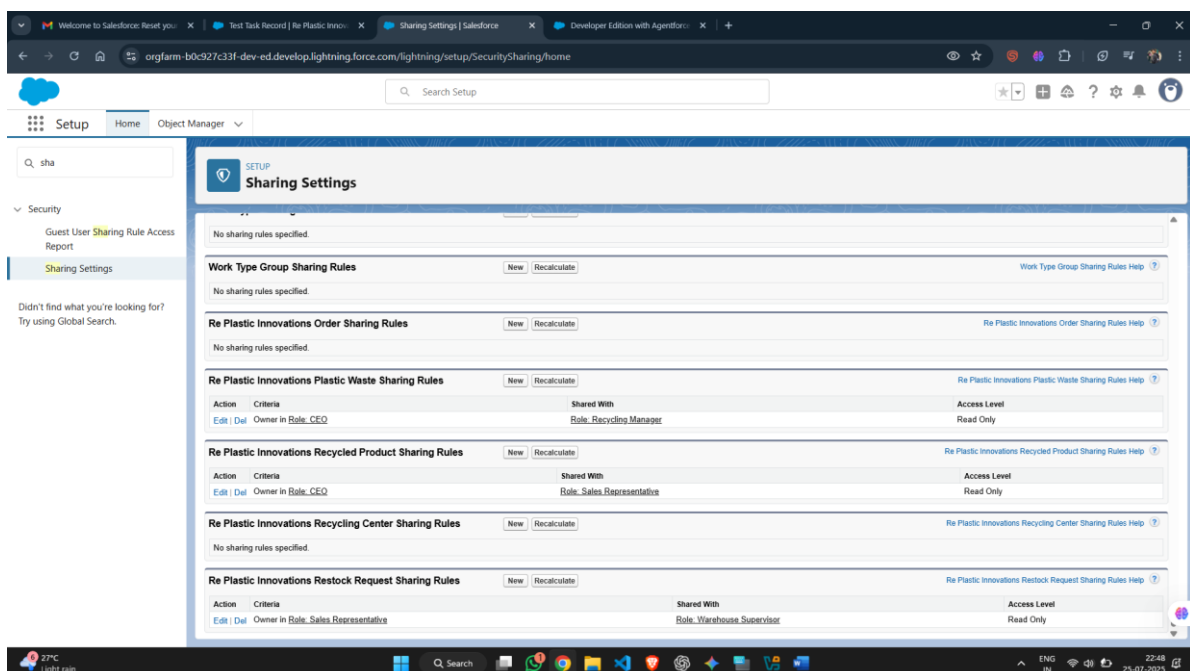
- **OWDs:**
  - Re Plastic Innovations Order: Private
  - Re Plastic Innovations Plastic Waste: Private
  - Re Plastic Innovations Recycled Product: Public Read Only
  - Re Plastic Innovations Recycling Center: Public Read/Write
 - Re Plastic Innovations Restock Request: Private

- **Sharing Rules:**
  - Recycling_Manager_Access: Shared Re Plastic Innovations Plastic Waste records owned by CEO role with Recycling Manager role (Read Only).
  - Sales_Representative_Recycled_Product_Access: Shared Re Plastic Innovations Recycled Product records owned by CEO role with Sales Representative role (Read Only).
  - Warehouse_Supervisor_Restock_Access: Shared Re Plastic Innovations Restock Request records owned by Sales Representative role with Warehouse Supervisor role (Read Only).
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Data Configuration

- **Formula Field - Stock Low On Product:** Created on Re Plastic Innovations Recycled Product object. This Text formula field displays "Low Stock - Restock Needed" if Stock_Level__c is less than Threshold__c, otherwise "Sufficient Stock".
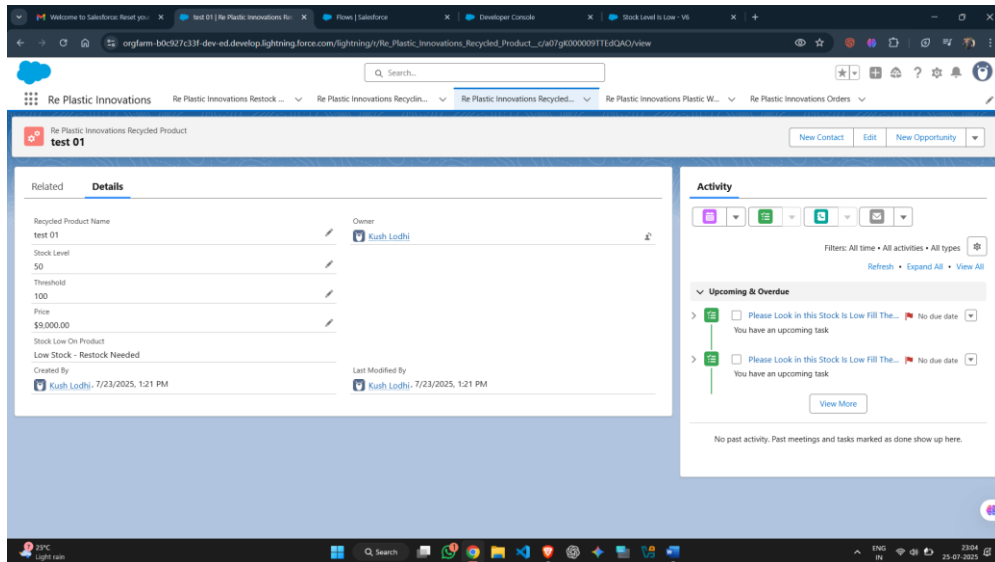

- **Validation Rule - Check_Quantity_Not_Zero:** Created on Re Plastic Innovations Order object. Prevents saving an order if Quantity__c is less than or equal to 0, with an error message "Quantity must be greater than zero."
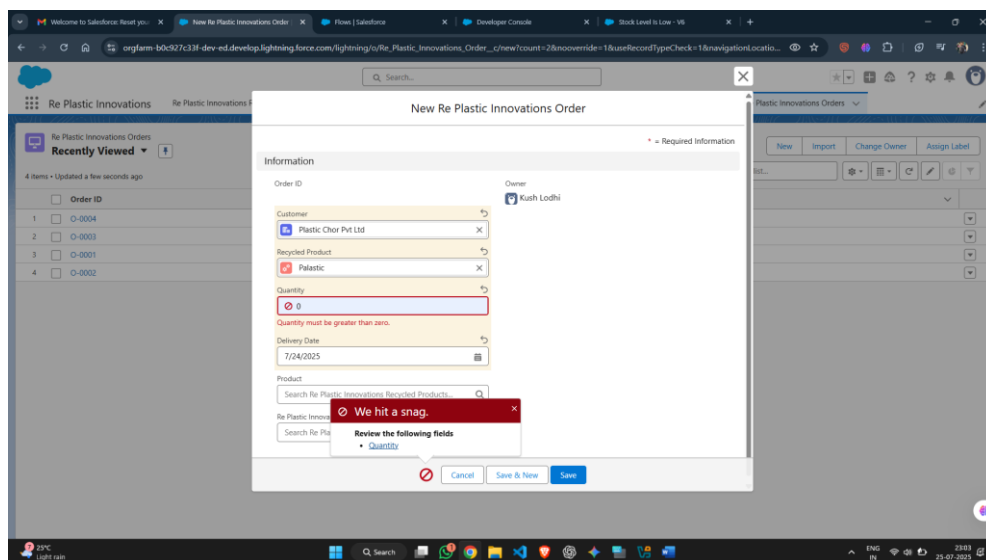
- **Validation Rule - Future_Date_Collection:** Created on Re Plastic Innovations Plastic Waste object. Prevents saving a record if Collection_Date__c is in the future, with an error message "Collection Date cannot be in the future."

Automation - Flow Builder

- A **Scheduled-Triggered Flow** named Stock Level Is Low was implemented.

    o **Schedule:** Runs daily at 6:00 AM.

    o **Object:** Re Plastic Innovations Recycled Product.

    o **Logic:** For each Recycled Product record, it checks if Stock_Level__c is less than Threshold__c.

    o **Action:** If stock is low, it creates a Task assigned to the Product Owner, related to the Recycled Product, with a priority of "High" and a subject "Please Look in this Stock is Low Fill The Stock ASAP".
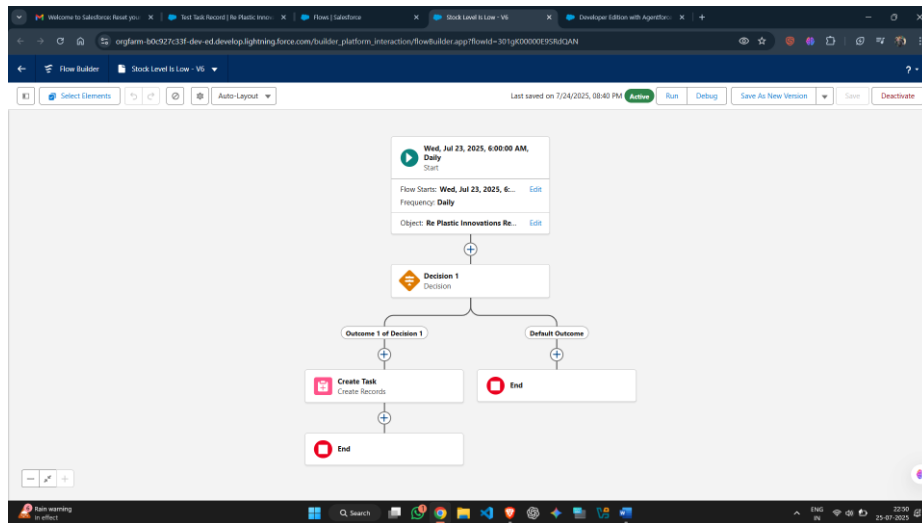
Automation - Apex

Advanced business logic was implemented using Apex classes and triggers:

- **Apex Class - InventoryManager:**

    o processOrderStock : The system automatically creates a Re Plastic Innovations Restock Request in 'Pending' status if the order quantity exceeds available stock.

    o processRestockApproval : This method increases the stock of Recycled Products when a Restock Request changes to 'Approved' status.
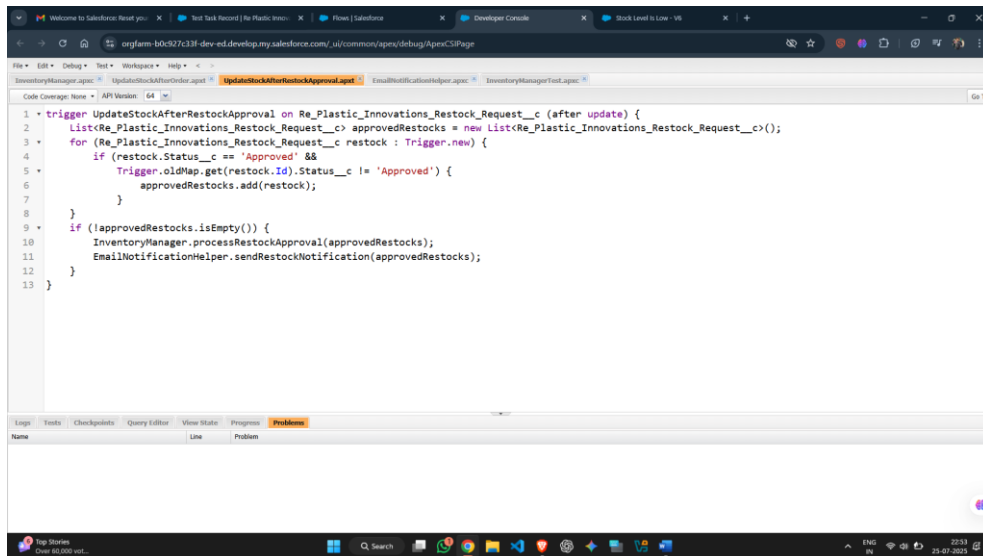
- **Apex Class - EmailNotificationHelper:**

  - sendRestockNotification : This method sends an email notification to a specified recipient (e.g., warehouse manager) when a restock request is approved.

- **Apex Trigger - UpdateStockAfterOrder:**

  - **On Object:** Re_Plastic_Innovations_Order__c

  - **Action:** Calls InventoryManager.processOrderStock() to update Recycled Product stock and create Restock Requests as needed.

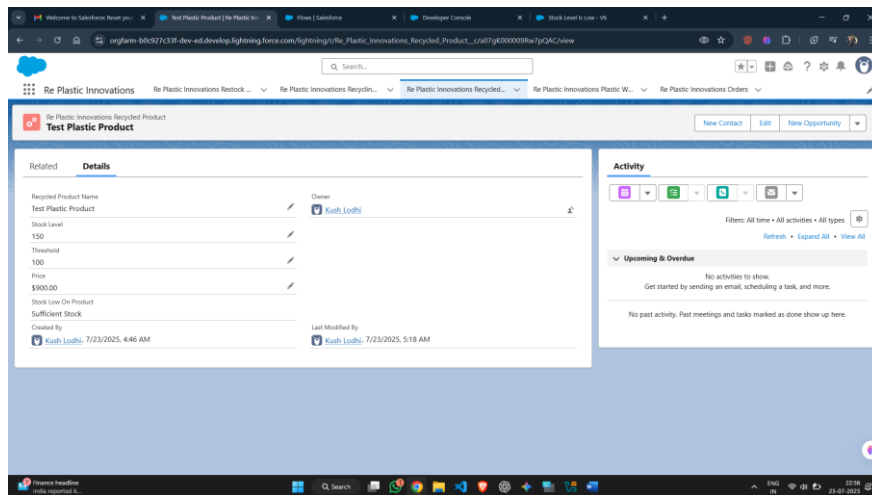- **Apex Trigger - UpdateStockAfterRestockApproval:**

  - **On Object:** Re_Plastic_Innovations_Restock_Request__c

  - **Action:** Checks if the Status field changed to 'Approved'. If so, it calls InventoryManager.processRestockApproval() to update Recycled Product stock and EmailNotificationHelper.sendRestockNotification() to send an email.

5. Project Explanation with Real-World Examples

The "RePlastix Innovations" solution digitalizes and automates key aspects of a recycling and recycled product business:

- **Plastic Waste Collection:** A Re Plastic Innovations Plastic Waste record is created for each new batch of plastic waste, with "Quality Inspector Mike" entering data to ensure future collection dates.

- **Recycling Center Management:** The Re Plastic Innovations Recycling Center records facility details, requiring collaboration among all internal users to manage these central facilities through the Public Read/Write OWD.

- **Recycled Product Inventory:** Re Plastic Innovations uses a "Stock Low On Product" formula field to automatically alert users when stock levels drop below a set threshold, aiding in inventory management decisions.

- **Order Fulfillment:** A Re Plastic Innovations Order record is created with a validation rule, and the UpdateStockAfterOrder Apex Trigger automatically deducts the ordered quantity from the Recycled Product's Stock Level.

- **Automated Restock Requests:** InventoryManager's processOrderStock method generates a Re Plastic Innovations Restock Request record when an order exceeds current stock, eliminating manual tracking of stock deficits.
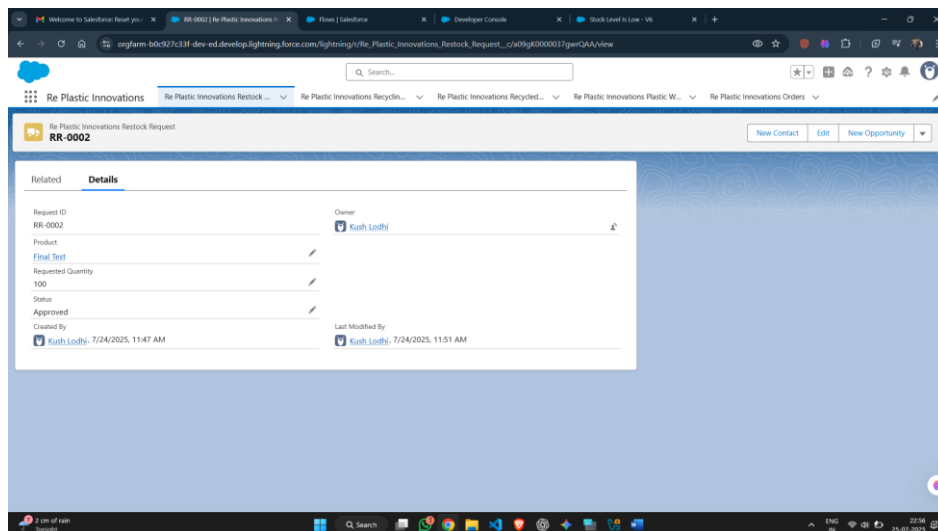
- **Restock Approval and Stock Replenishment:** Plant Manager Albert approves a Restock Request, triggers InventoryManager's processRestockApproval method, increases Recycled Product stock level, and sends email confirmation to relevant personnel, streamlining supply chain.

- **Granular Data Access:** Users can customize access to objects and records through Profiles and Sharing Rules, while the Role Hierarchy enables managers to oversee data across subordinates.

6. Conclusion

This Salesforce project successfully delivers a comprehensive and integrated solution for RePlastic Innovations. By leveraging Salesforce's declarative and programmatic capabilities, the system effectively manages plastic waste, optimizes recycled product inventory, streamlines order fulfillment, and automates critical business processes. The robust security model ensures data integrity and controlled access. This foundation provides RePlastic Innovations with a powerful tool to enhance efficiency, support sustainable practices, and facilitate growth in their mission to transform plastic waste into valuable solutions.