

# A CRM Application for Engineering Works

## 1. Project Overview

The CRM Application for Engineering Works project is designed to address the challenges of managing client information, material requirements, and engineering workflows in a structured and efficient manner. The application aims to streamline the operations of engineering services, including fabrication, shed construction, and pipe lining, by integrating data management, process tracking, and automated calculations into a single platform.

The primary objective is to automate the computation of project costs based on the materials and measurements provided and to ensure accurate tracking of workflows, such as drilling, welding, cutting, and folding. By leveraging advanced technologies, this CRM system enhances operational efficiency, improves data accuracy, and ensures better project tracking for timely execution.

The project delivers a user-friendly interface that simplifies data entry, automates repetitive tasks, and provides actionable insights through detailed reporting. It aims to elevate client satisfaction by ensuring

transparency, efficiency, and a seamless project management experience.

This solution ultimately supports the long-term goals of engineering businesses by reducing manual errors, optimizing resource allocation, and improving overall productivity.

## 2. Objectives

The primary objective of the CRM Application for Engineering Works project is to develop an efficient system that: ○ **Streamlines**

### **Client Information Management:**

- ✦ Centralizes the storage and management of client, company, and contact details.

### ○ **Automates Cost Estimation:**

- ✦ Provides an accurate and automated price calculation feature based on materials and measurements.

### ○ **Enhances Workflow Management:**

- ✦ Tracks and manages engineering processes such as fabrication, shed construction, and pipe lining with detailed status updates.

### ○ **Optimizes Material Usage:**

- ✦ Tracks material requirements and usage, reducing wastage and ensuring proper inventory control.

### ○ **Improves Operational Efficiency:**

- ✦ Automates repetitive tasks to save time and reduce human errors in project management.

- **Delivers Actionable Insights:**

- ✦ Offers detailed reporting and analytics for better decisionmaking and resource allocation.

- **Increases Client Satisfaction:**

- ✦ Ensures transparent, accurate, and timely project execution to meet client needs effectively.

These objectives align with the broader goal of enabling engineering businesses to enhance productivity, streamline operations, and deliver better outcomes to their clients.

### **3. Salesforce Key Features and Concepts Utilized**

- † **Custom Objects and Fields:**

- Created custom objects to manage client information, project details, and engineering workflows.
- Defined fields for material specifications, measurements, and price calculations.

- † **Process Automation:**

- Implemented Flow Builder to automate workflows, such as project status updates and material usage tracking.

- Used Apex Triggers to handle complex automation scenarios, including automated price computation.

#### † **Validation Rules:**

- Applied validation rules to ensure accurate data entry for measurements, materials, and client details.

#### † **Reports and Dashboards:**

- Developed custom dashboards to visualize project progress, material inventory, and client interaction data.
- Created detailed reports for operational insights and decisionmaking.

#### † **Lightning Components:**

- Utilized Salesforce Lightning components for an intuitive and dynamic user interface.
- Enhanced user experience by integrating drag-and-drop functionality and visual process tracking.

#### † **Data Security and Sharing:**

- Configured role-based access controls to ensure sensitive data, such as client information and pricing, is securely managed.

#### † **Approval Processes:**

- Integrated approval workflows for project plans and material usage to streamline internal processes.

#### † **Chatter Collaboration:**

- Enabled real-time collaboration among team members using Salesforce Chatter for project updates and discussions.

#### † **Mobile Accessibility:**

- Configured Salesforce Mobile App for on-the-go access to project data and client interactions.

#### † **Integration with Third-Party Tools:**

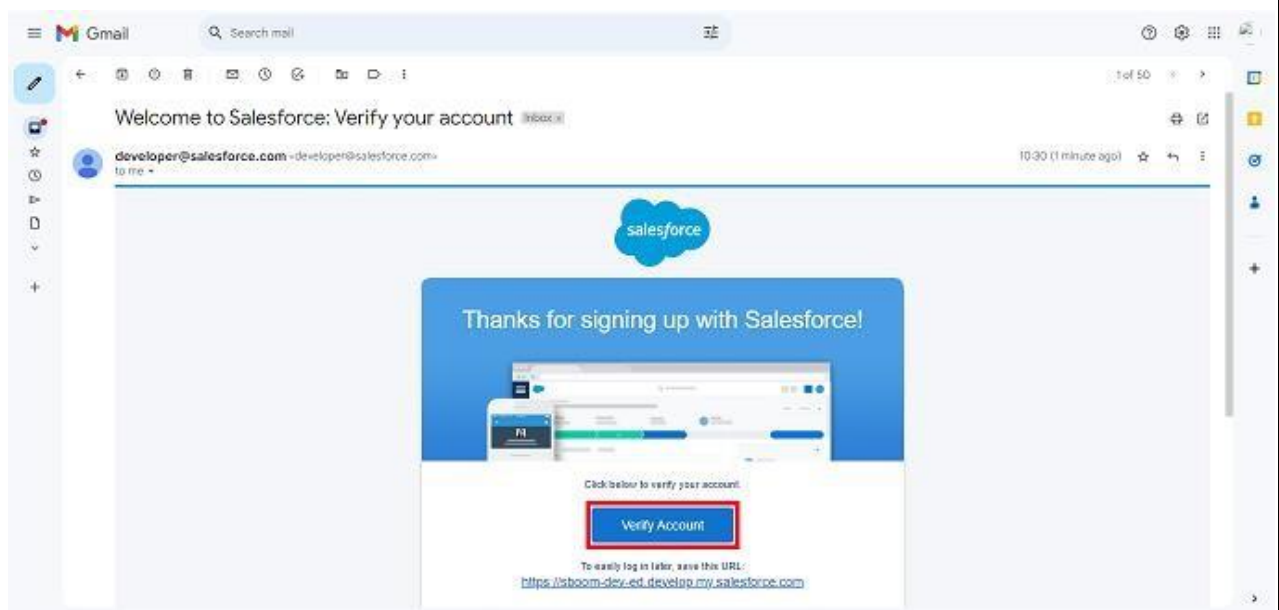
- Integrated with external systems for inventory management and accounting to provide a seamless experience.
- These Salesforce features ensure a robust, efficient, and userfriendly CRM solution tailored for managing engineering works.

## **4. Detailed Steps to Solution Design**

### **Step 1: Creating Developer Account and Activation**

- ✦ Creating a developer org in salesforce.

- To Activate the account, click on the verify account. Give a password and answer a security question and click on change password.
- Give a password and answer a security question and click on change password. Then you will redirect to your salesforce setup page.



## Step 2: Create Custom Objects

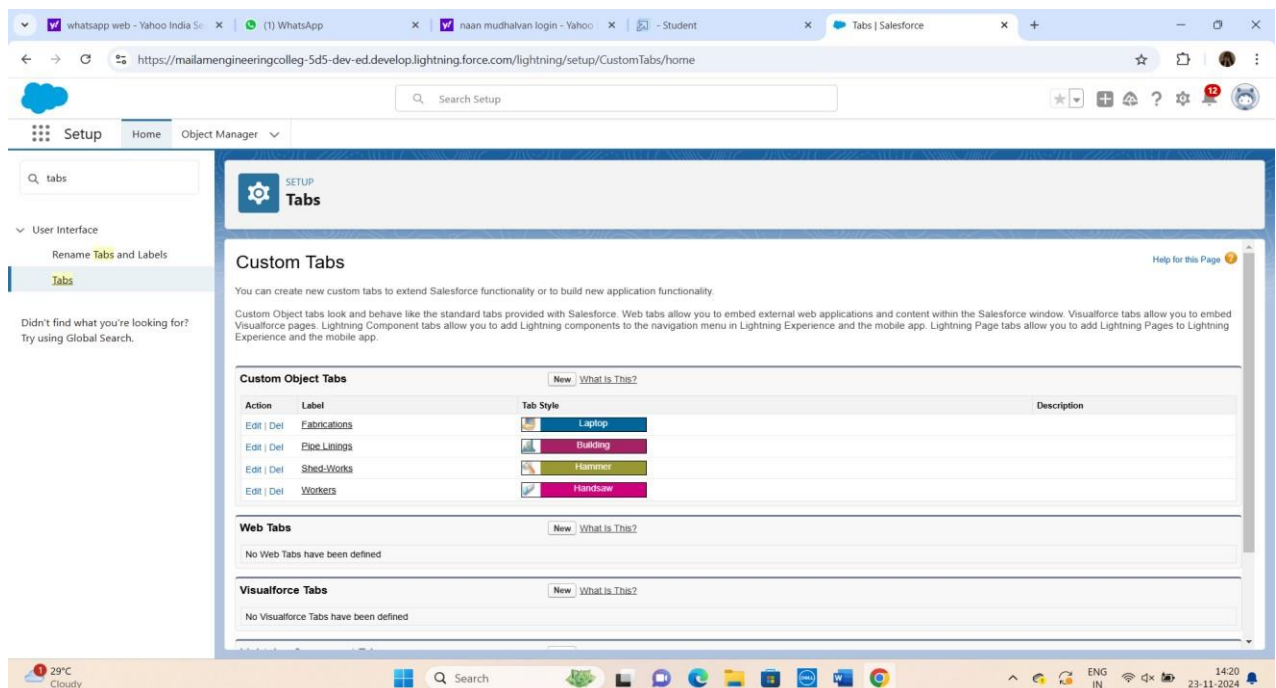
- Navigate to **Setup > Object Manager > Create > Custom Object**.
- Create the following objects:
  1. **Fabrication Object**
  2. **Shed-Work Object**
  3. **Pipe Lining Object**
  4. **Worker Object**

- Define labels, plural labels, record name format, and data type for each object.



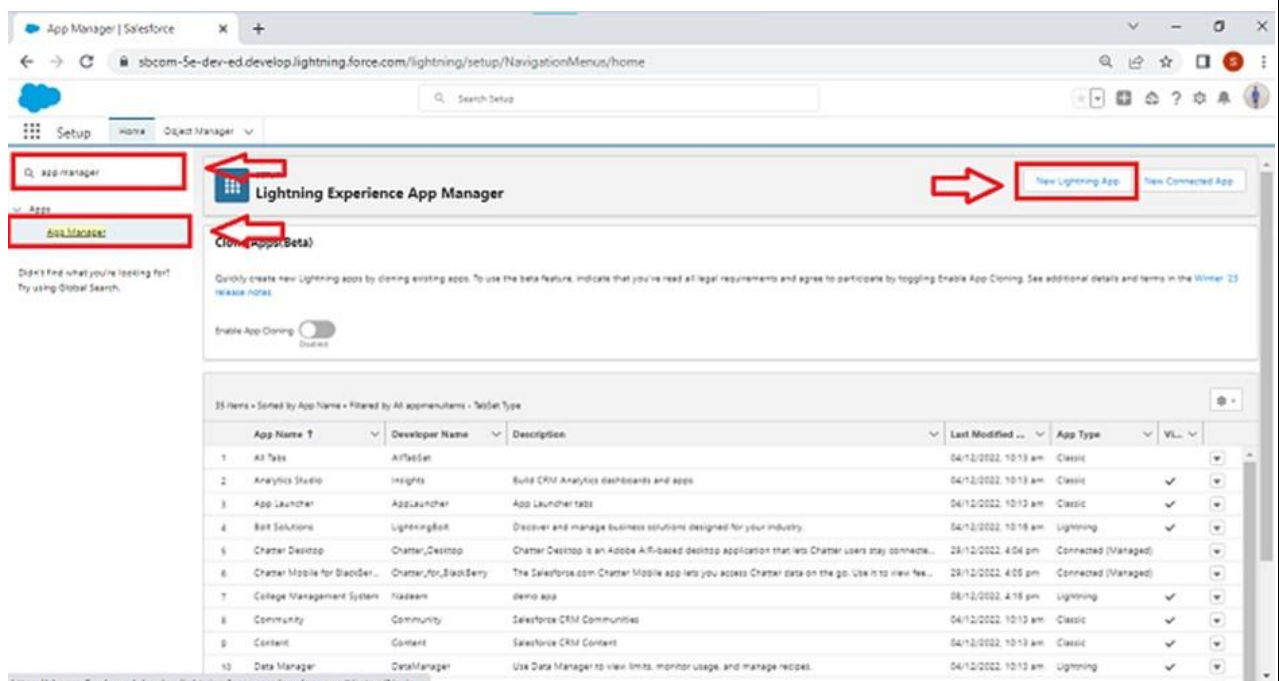
### Step 3: Create Custom Tabs

- Tabs allow users to view and create records for your objects.
- Go to **Setup > Quick Find > Tabs > New (Custom Tab)**.
- Select an object and choose a tab style.
- Ensure "Append tab to users' existing personal customizations" is checked.
- Save your changes.



## Step 4: Create a Lightning App

- Apps group related items and functionalities.
- Create a Lightning App named "**Engineering Works**":
  - ✦ Navigate to **Setup > App Manager > New Lightning App**.
  - ✦ Follow the wizard to configure your app.



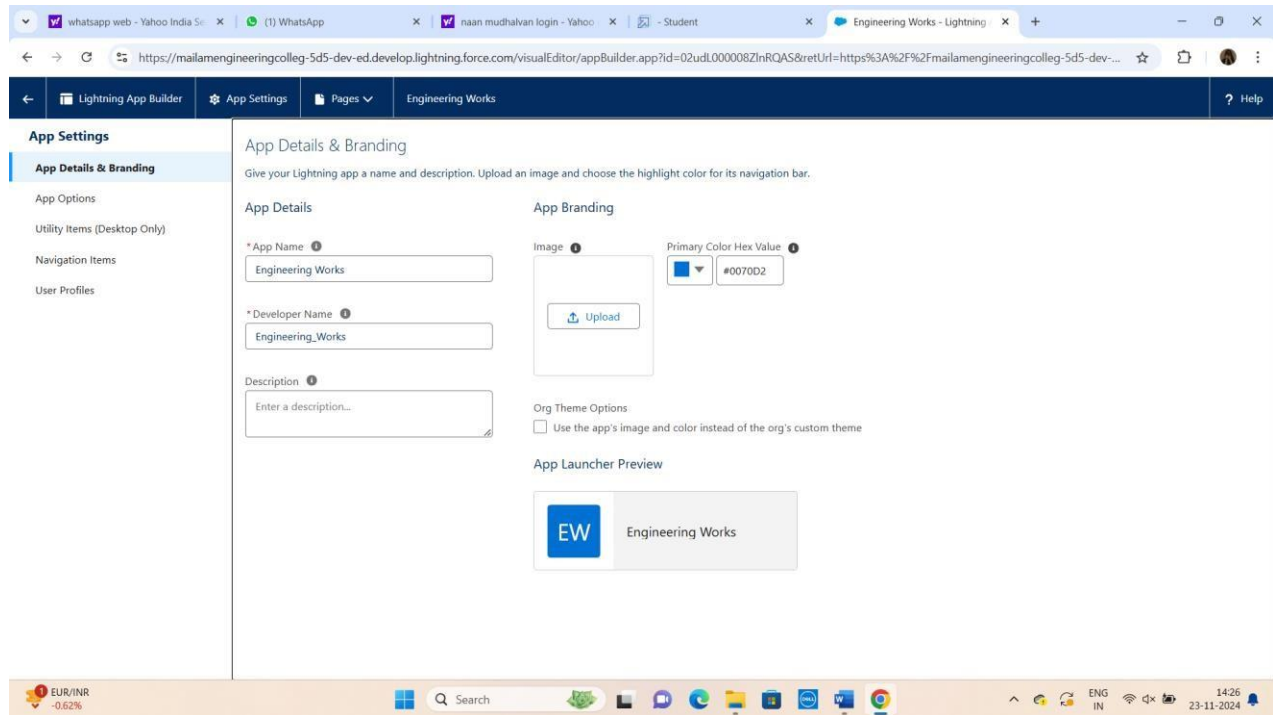
Lightning Experience App Manager

Clone App (Beta)

Enable App Cloning: ☐ [Details](#)

App Name	Developer Name	Description	Last Modified	App Type	VL
1. All Tabs	AllTabSet		04/12/2022, 10:13 am	Classic	
2. Analytics Studio	Insights	Build CRM Analytics dashboards and apps	04/12/2022, 10:13 am	Classic	✓
3. App Launcher	AppLauncher	App Launcher tabs	04/12/2022, 10:13 am	Classic	✓
4. Bolt Solutions	LightningBolt	Discover and manage business solutions designed for your industry.	04/12/2022, 10:16 am	Lightning	✓
5. Chatter Desktop	ChatterDesktop	Chatter Desktop is an Adobe AIR-based desktop application that lets Chatter users stay connecte...	23/12/2022, 4:04 pm	Connected (Managed)	
6. Chatter Mobile for BlackBerry	ChatterforBlackBerry	The Salesforce.com Chatter Mobile app lets you access Chatter data on the go. Use it to view fe...	23/12/2022, 4:05 pm	Connected (Managed)	
7. College Management System	Hasseem	demo app	08/12/2022, 4:18 pm	Lightning	✓
8. Community	Community	Salesforce CRM Communities	04/12/2022, 10:13 am	Classic	✓
9. Content	Content	Salesforce CRM Content	04/12/2022, 10:13 am	Classic	✓
10. Data Manager	DataManager	Use Data Manager to view limits, monitor usage, and manage recaps.	04/12/2022, 10:13 am	Lightning	✓





## Step 5: Create Fields

- Add custom fields for each object.
- Example fields for the **Fabrication Object**:

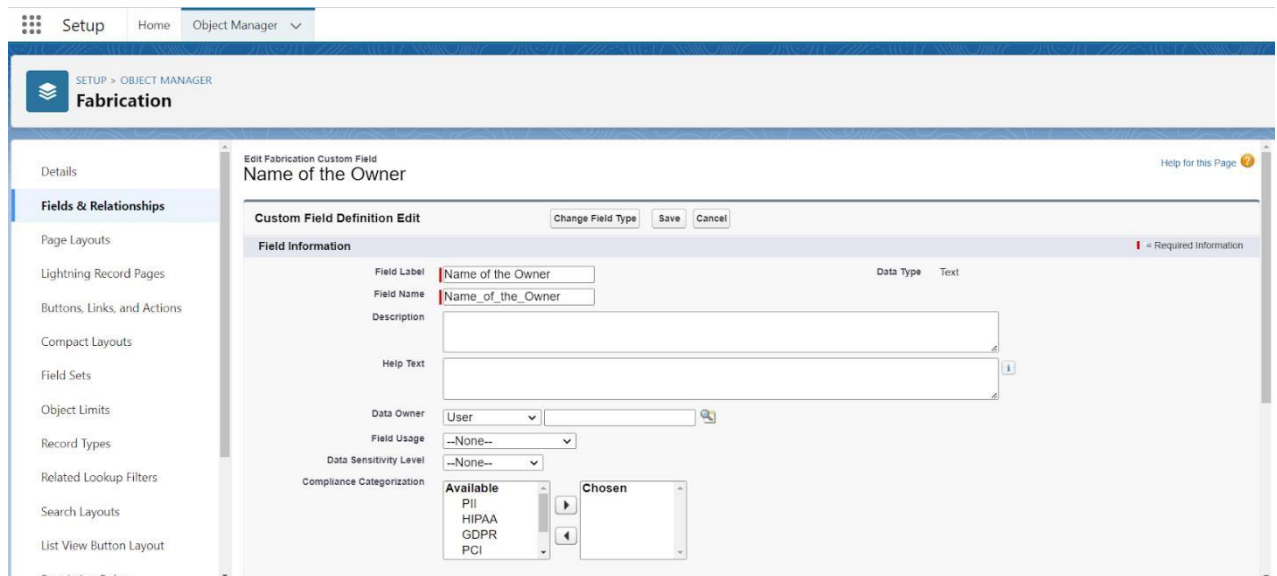
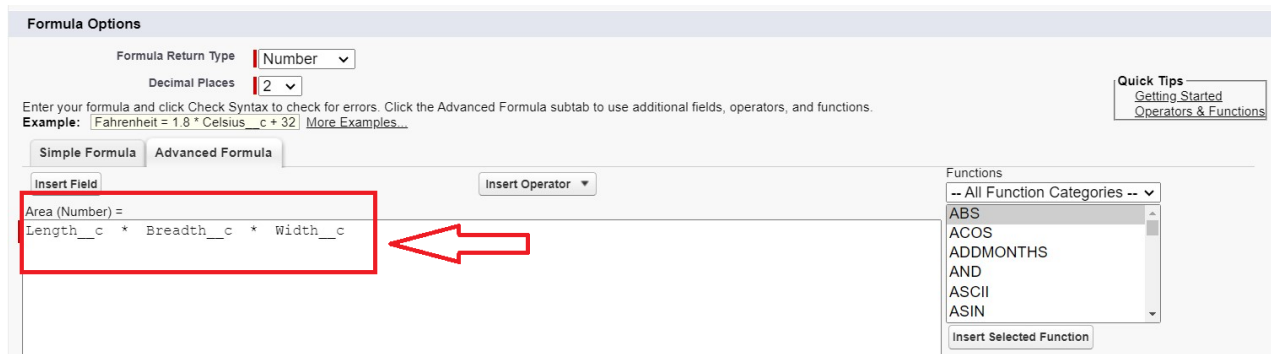
### 1. Name of the Owner

- ✦ Field Name: Name\_of\_the\_Owner
- ✦ Data Type: Text (Length: 125)

### 2. Name of the Company

- ✦ Field Name: Name\_of\_Company □

Repeat for other objects.

## Step 6: Page Layouts

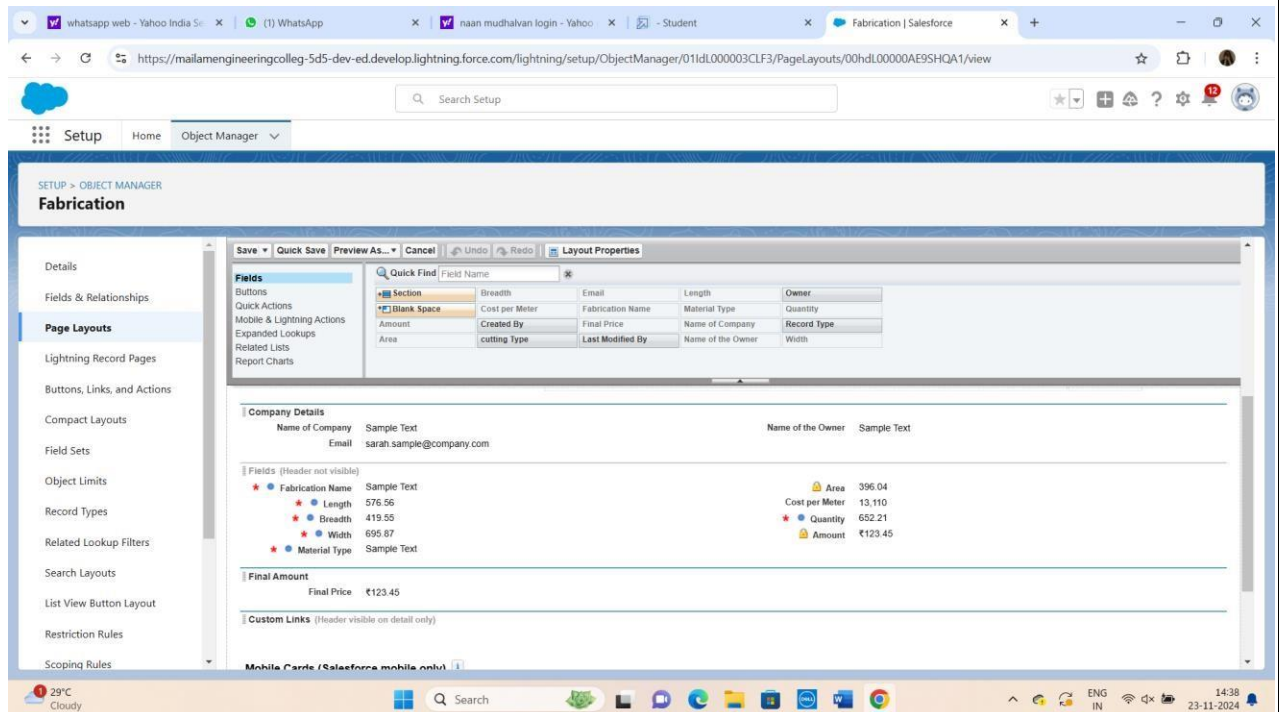
- Create page layouts to customize the object UI.
- For the Fabrication Object, create:
  1. Drilling Page Layout
  2. Welding Page Layout
  3. Cutting Page Layout

## 4. Folding Page Layout

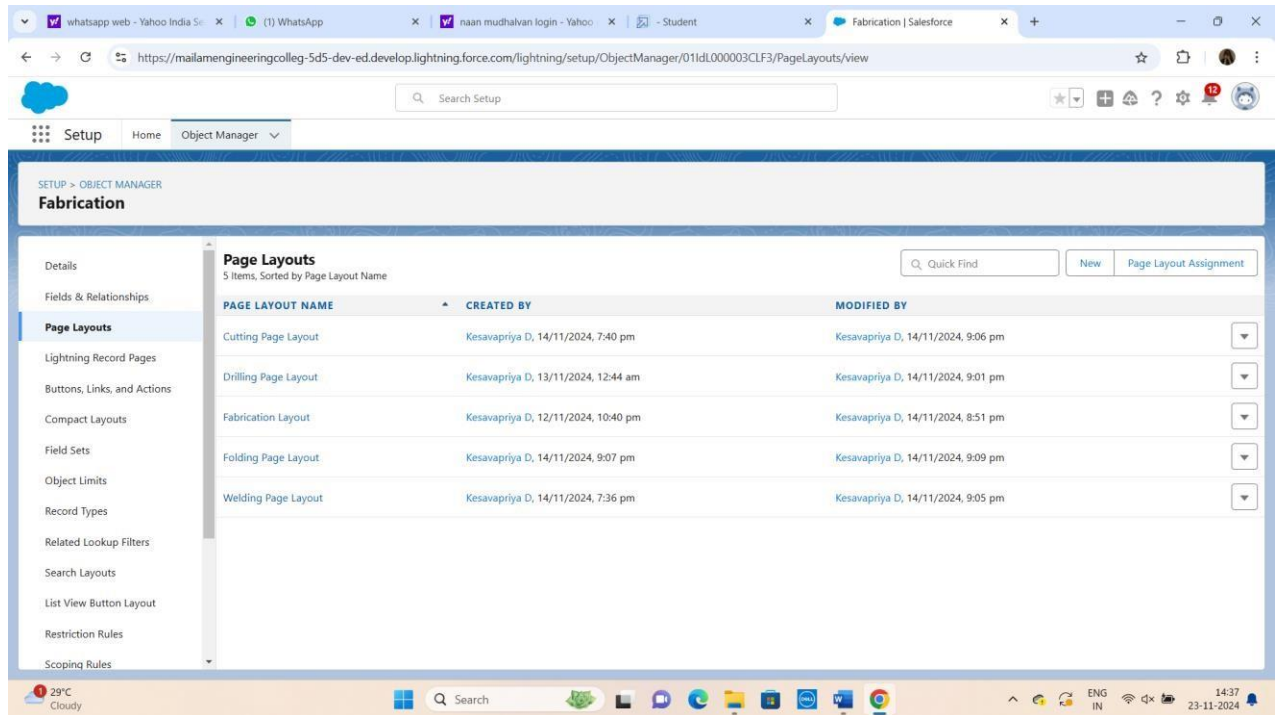
□ Assign appropriate fields to each layout:

✦ Go to **Setup > Object Manager > Fabrication > Page Layouts > New.**

✦ Drag and arrange fields as required.



The screenshot shows the Salesforce Object Manager interface for configuring a new page layout for the 'Fabrication' object. The left sidebar lists various setup options, with 'Page Layouts' selected. The main area displays the 'Layout Properties' window, which includes a 'Fields' list on the left and a 'Quick Find' search bar. The 'Fields' list contains various fields such as 'Section', 'Blank Space', 'Amount', 'Area', 'Created By', 'Cutting Type', 'Last Modified By', 'Name of the Owner', 'Width', 'Fabrication Name', 'Length', 'Material Type', 'Quantity', 'Final Price', and 'Name of the Company'. The 'Quick Find' search bar is set to 'Field Name'. The main area shows the layout configuration for 'Company Details', 'Fields (Header not visible)', 'Final Amount', and 'Custom Links (Header visible on detail only)'. The 'Company Details' section includes fields for 'Name of Company', 'Email', 'Name of the Owner', and 'Sample Text'. The 'Fields (Header not visible)' section includes fields for 'Fabrication Name', 'Length', 'Breadth', 'Width', 'Material Type', 'Sample Text', 'Area', 'Cost per Meter', 'Quantity', and 'Amount'. The 'Final Amount' section includes the 'Final Price' field. The 'Custom Links (Header visible on detail only)' section is currently empty. The bottom of the screen shows the Windows taskbar with the date and time as 23-11-2024 14:38.

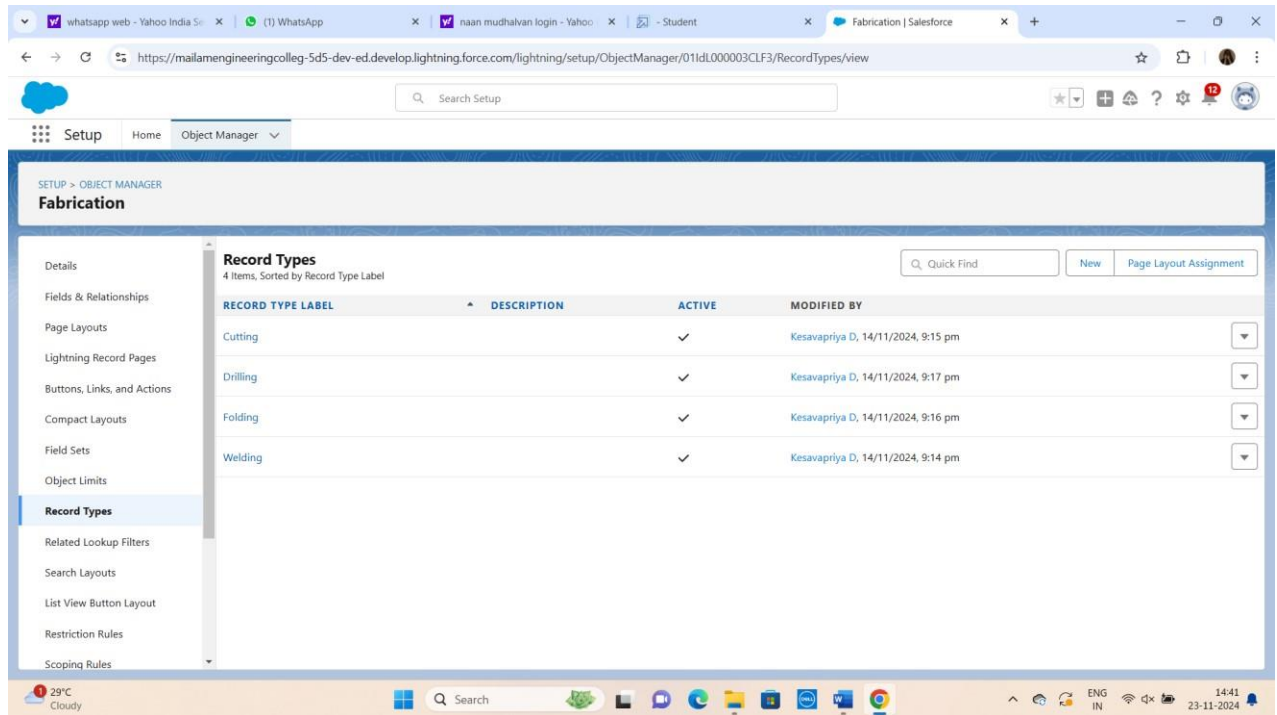


The screenshot shows the Salesforce Setup interface for the Fabrication object. The left sidebar lists various setup options, with 'Page Layouts' selected. The main content area displays a table of page layouts for the Fabrication object, sorted by name. The table has three columns: PAGE LAYOUT NAME, CREATED BY, and MODIFIED BY. There are five page layouts listed: Cutting Page Layout, Drilling Page Layout, Fabrication Layout, Folding Page Layout, and Welding Page Layout. Each layout is created and modified by 'Kesavapriya D'.

PAGE LAYOUT NAME	CREATED BY	MODIFIED BY
Cutting Page Layout	Kesavapriya D, 14/11/2024, 7:40 pm	Kesavapriya D, 14/11/2024, 9:06 pm
Drilling Page Layout	Kesavapriya D, 13/11/2024, 12:44 am	Kesavapriya D, 14/11/2024, 9:01 pm
Fabrication Layout	Kesavapriya D, 12/11/2024, 10:40 pm	Kesavapriya D, 14/11/2024, 8:51 pm
Folding Page Layout	Kesavapriya D, 14/11/2024, 9:07 pm	Kesavapriya D, 14/11/2024, 9:09 pm
Welding Page Layout	Kesavapriya D, 14/11/2024, 7:36 pm	Kesavapriya D, 14/11/2024, 9:05 pm

## Step 7: Record Types

- Create record types for specific functionalities.
- For the Fabrication Object:
  - ✦ Navigate to **Setup > Object Manager > Fabrication > Record Types**.
  - ✦ Create record types like **Drilling, Welding, Cutting, Folding**.
  - ✦ Assign appropriate page layouts to each record type.

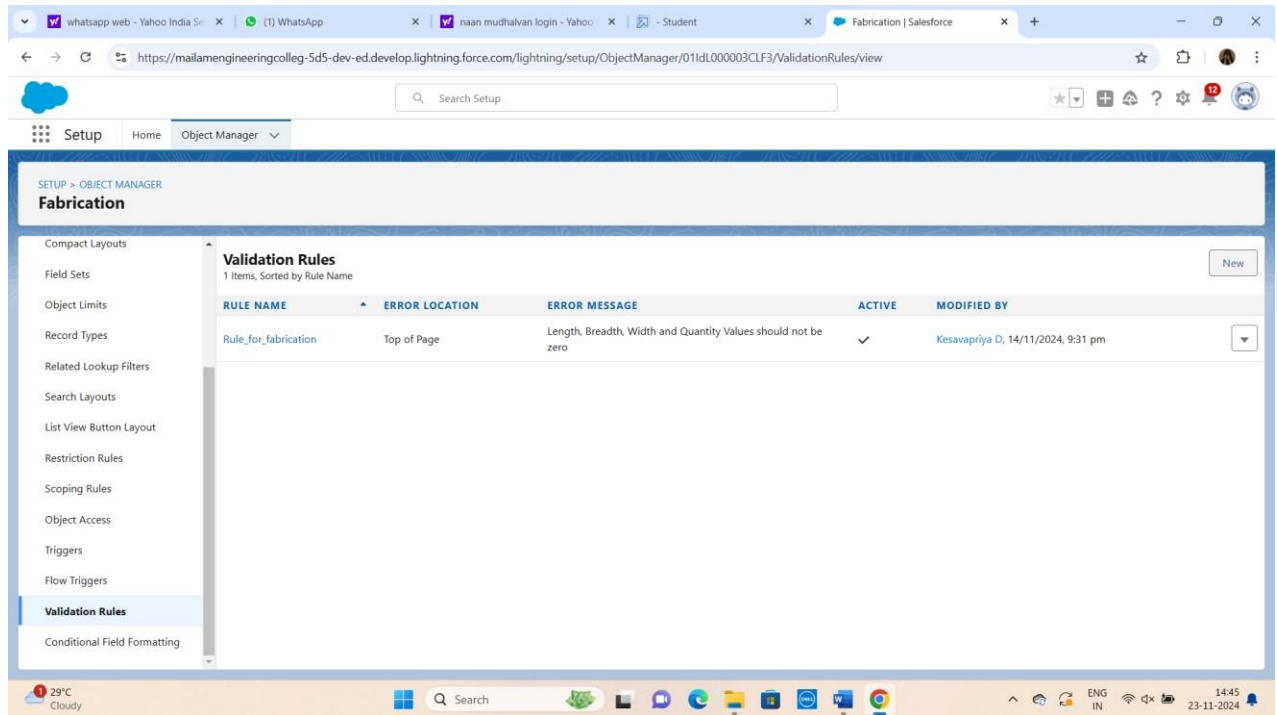


The screenshot shows the Salesforce Object Manager setup for the Fabrication object. The left sidebar lists various setup options, with 'Record Types' selected. The main area displays a table of record types for Fabrication.

RECORD TYPE LABEL	DESCRIPTION	ACTIVE	MODIFIED BY
Cutting		✓	Kesavapriya D, 14/11/2024, 9:15 pm
Drilling		✓	Kesavapriya D, 14/11/2024, 9:17 pm
Folding		✓	Kesavapriya D, 14/11/2024, 9:16 pm
Welding		✓	Kesavapriya D, 14/11/2024, 9:14 pm

## Step 8: Validation Rules

- Enforce data integrity with validation rules.
- For the Fabrication Object:
  - ✦ Navigate to **Setup > Object Manager > Fabrication > Validation Rules > New.**
  - ✦ Rule Name: *Rule\_for\_Fabrication*
  - ✦ Formula:  $OR(Length\_c == 0, Breadthc == 0, Width\_c == 0, Quantity == 0)$
  - Error Message: "Length, Breadth, Width, and Quantity values should not be zero." □ Save the rule.



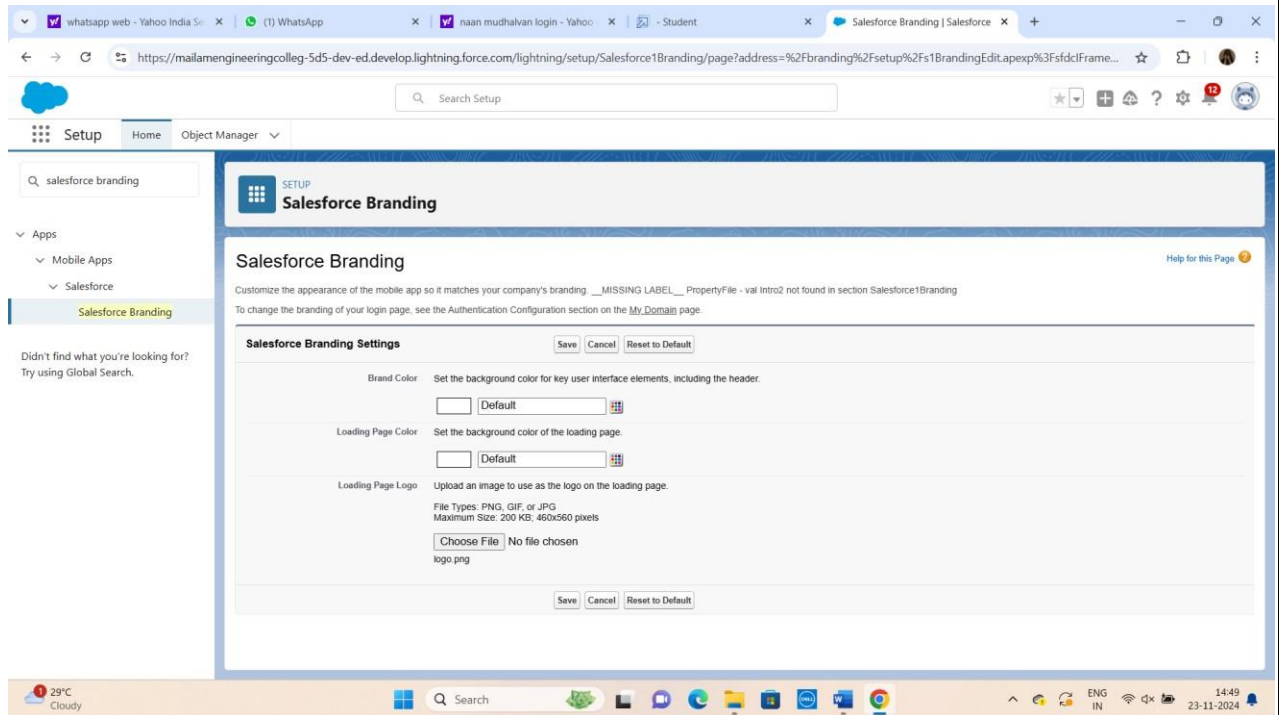
The screenshot shows the Salesforce Setup page for the 'Fabrication' object. The left sidebar lists various setup options, with 'Validation Rules' selected. The main content area displays a table of validation rules for the 'Fabrication' object. The table has columns for Rule Name, Error Location, Error Message, Active status, and Modified By. One rule is listed: 'Rule\_for\_fabrication' with an error message 'Length, Breadth, Width and Quantity Values should not be zero'.

RULE NAME	ERROR LOCATION	ERROR MESSAGE	ACTIVE	MODIFIED BY
Rule_for_fabrication	Top of Page	Length, Breadth, Width and Quantity Values should not be zero	✓	Kesavapriya D, 14/11/2024, 9:31 pm

## Step 9: Email Templates

□ Upload a Logo:

✦ Go to **Setup > Salesforce Branding** and upload a logo.

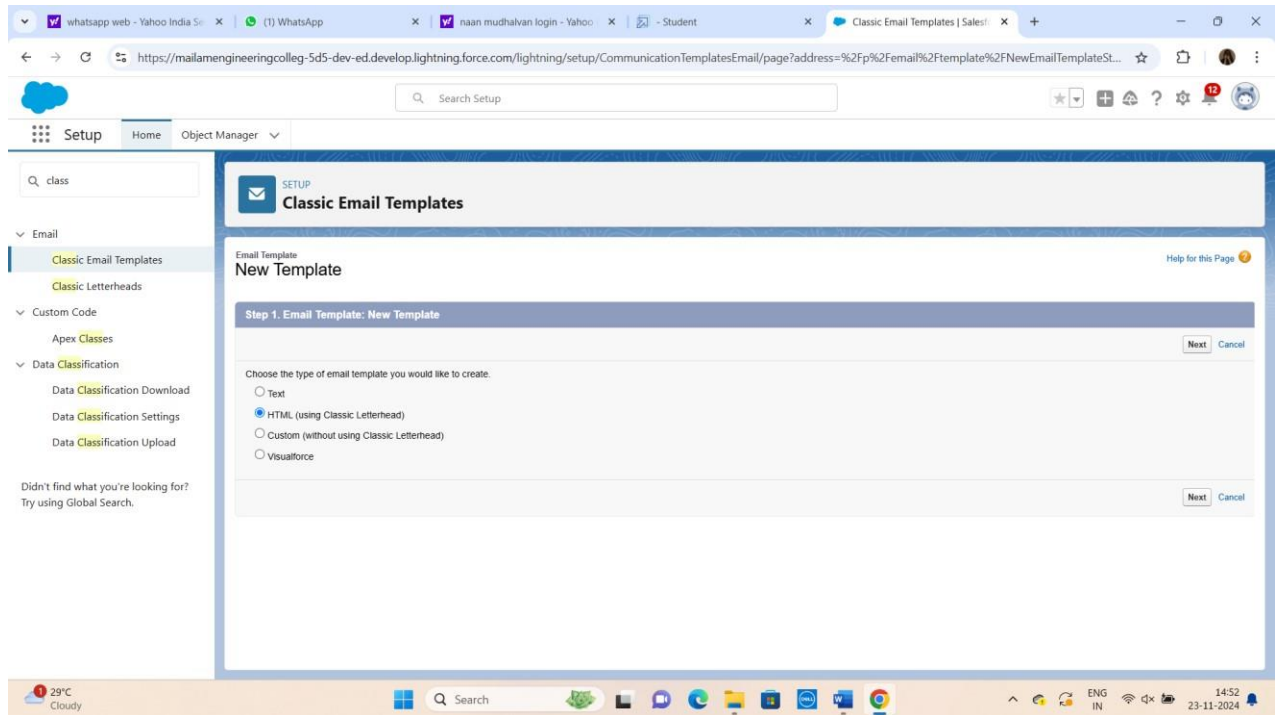


## □ Create a Letterhead:

- ✦ Navigate to **Setup > Classic Letterheads > New Letterhead**.
- ✦ Configure the letterhead and save it.

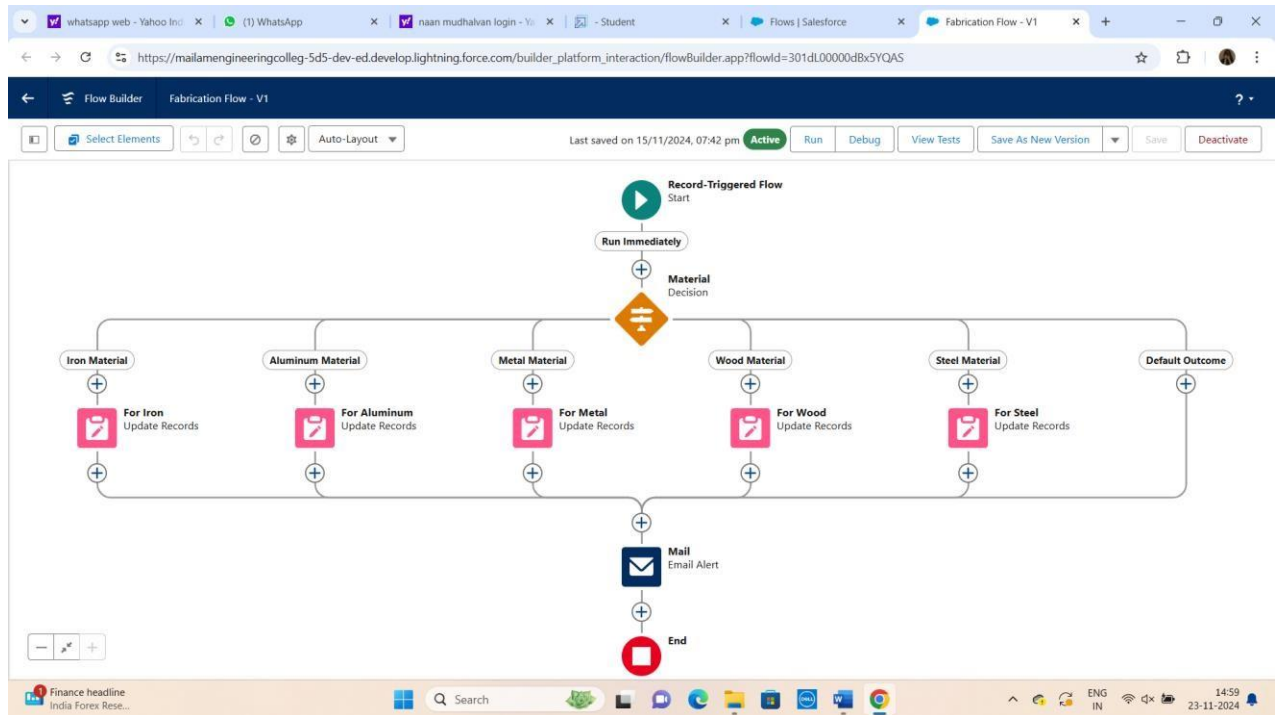
## □ Create an Email Template:

- ✦ Go to **Setup > Email Templates > New**.
- ✦ Choose **HTML (using Classic Letterhead)**.



- ✦ Example template:
- ✦ Name: **Bill Template**
- ✦ Subject: **Fabrication Template**
- ✦ Body: Include dynamic fields like  
`{!Fabrication_c.Length_c}, {!Shed_Workc.Width_c}, etc.`
- ✦ Save the template.





## 5. Testing and Validation

Effective testing ensures the functionality, performance, and reliability of the Salesforce solution. Here's a concise approach:

### 1. Unit Testing

Focuses on validating backend components like Apex classes and triggers.

#### Key Steps:

- **Apex Classes:** Write test classes (`@isTest`) to cover logic and scenarios. Use assertions to verify expected outputs.
- **Triggers:** Test all trigger events (`beforeInsert`, `afterUpdate`, etc.), ensuring proper execution and no conflicts.

- **Code Coverage:** Aim for at least 75% code coverage by testing all paths, including edge cases and exception handling.

## 2. User Interface (UI) Testing

Ensures the user-facing components function as expected.

### Key Steps:

Custom Objects and Fields: Validate field properties (e.g., required fields, lengths) and operations (create, read, update, delete).

- **Tabs:** Ensure proper display and functionality of custom tabs.
- **Page Layouts:** Verify field arrangement on each layout (e.g., Drilling, Welding).
- **Record Types:** Confirm appropriate page layouts are assigned to each record type.
- **Validation Rules:** Test invalid data inputs to ensure error messages appear correctly.
- **Lightning App:** Validate the navigation, responsiveness, and performance of the "Lease Management" app.

## 3. Email Templates Testing

Verify email templates populate fields correctly and render well across email clients.

### Key Steps:

- Test dynamic field population (e.g., `{!Fabrication_c.Name_of_the_Owner_c}`).
- Check email formatting and attachments (if any).
- Send test emails to ensure compatibility across platforms.

#### 4. Best Practices

- Test early and iteratively to identify issues at each development stage.
- Document test cases, outcomes, and resolutions for reference.
- Leverage Salesforce testing tools like Developer Console and Salesforce Inspector.
- Collect end-user feedback for UI enhancements.

#### Outcome

Comprehensive testing ensures a seamless user experience, robust functionality, and adherence to business requirements.

## 6. Key Scenarios Addressed by Salesforce in the Implementation Project

The implementation project demonstrates Salesforce's capability to address multiple business scenarios and operational challenges effectively. Here are the key scenarios:

### 1. Streamlining Operations with Custom Objects

- **Scenario:** Managing diverse workflows like fabrication, shed-work, pipe-lining, and worker management.
- **Solution:** Custom objects enable structured storage and retrieval of data related to these workflows, ensuring accurate tracking and reporting.

### 2. Enhanced Data Accessibility through Tabs

- **Scenario:** Users need an intuitive interface to view and manage object records efficiently.
- **Solution:** Custom tabs provide a user-friendly interface, improving navigation and quick access to data.

### 3. Consolidated Workflows via Lightning Apps

- **Scenario:** Users require a unified platform to manage processes and related data seamlessly.

- **Solution:** The "Lease Management" Lightning App integrates functionalities, reducing silos and improving collaboration.

#### 4. Flexibility through Page Layouts and Record Types

- **Scenario:** Different user roles and workflows need customized interfaces and processes.
- **Solution:** Page layouts and record types allow tailored experiences, accommodating unique workflows like drilling, welding, cutting, and folding.

#### 5. Data Integrity with Validation Rules

- **Scenario:** Ensuring data accuracy and consistency in critical fields like dimensions and quantities.
- **Solution:** Validation rules enforce constraints, preventing invalid data entries and ensuring reliable operations.

#### 6. Communication and Branding with Email Templates

- **Scenario:** Sending professional and customized communications to stakeholders.
- **Solution:** Branded email templates with dynamic fields ensure consistent and personalized messaging.

## 7. Scalable and Secure Data Management

- **Scenario:** Handling a growing volume of operational data while maintaining security.
- **Solution:** Salesforce's scalable architecture and robust security features support data growth without compromising safety.

### Outcome

This implementation showcases Salesforce's ability to handle operational complexity, enhance user experience, and deliver tailored solutions for diverse business scenarios

### Conclusion

The Salesforce implementation project demonstrates how powerful customization and automation capabilities can address complex business scenarios. By leveraging features such as custom objects, record types, validation rules, and Lightning Apps, the solution streamlines operations, enhances data accessibility, and ensures data integrity.

Additionally, the use of email templates and page layouts provides a usercentric and professional approach to communication and user interface design. Salesforce's flexibility, scalability, and robust architecture enable businesses to meet their operational needs efficiently while preparing for future growth.

This project underscores Salesforce's ability to deliver a tailored, efficient, and scalable solution that drives productivity, enhances user satisfaction, and achieves organizational goals effectively.