**Project Overview:**

The Rice Mill CRM Application aims to streamline daily operations within a wholesale rice mill by providing comprehensive data on rice production, sales, and customer engagement. The application is designed for rice mill owners to receive daily reports, enabling efficient decision-making and resource management.

**Objectives:**

**Business Goals**

1. **Improve Daily Operational Efficiency**  
   Streamline daily tracking of rice production, sales, and financial transactions to minimize manual record-keeping and increase productivity.
2. **Enhance Data-Driven Decision-Making**  
   Provide rice mill owners with actionable insights through real-time reporting and analytics to optimize resources and respond quickly to market demands.
3. **Increase Customer Satisfaction and Retention**  
   Enhance customer relationships by tracking purchasing patterns, offering personalized service, and ensuring timely order fulfillment based on historical data.
4. **Optimize Inventory and Supply Chain Management**  
   Facilitate better coordination with suppliers by monitoring stock levels and ensuring an uninterrupted supply of rice based on production and demand forecasts.

**Specific Outcomes**

1. **Daily Reporting and Analytics Dashboard**
   * **Deliverable**: A comprehensive dashboard with real-time insights into daily rice sales, revenue, and popular rice types.
   * **Measurement**: Successful generation of automated daily reports, accessible to owners for strategic planning and immediate decision-making.
2. **Rollup Summary Field for Supplier Data**
   * **Deliverable**: Rollup summary field displaying total rice supplied by each supplier, available on the supplier profile.
   * **Measurement**: Accurate roll-up of supply data, visible on the relevant supplier record, with up-to-date figures supporting supply chain management.
3. **Cross-Object Formula Fields for Payment Tracking**
   * **Deliverable**: Formula fields to automatically calculate the total payment due per transaction based on rice quantity and price per kilogram.
   * **Measurement**: Precise and up-to-date payment calculations, ensuring smooth and accurate financial transactions and invoicing.
4. **Enhanced Data Integrity via Validation Rules**
   * **Deliverable**: Validation rules (e.g., ISBLANK) to prevent incomplete data entries in critical fields.
   * **Measurement**: Fewer errors and complete records with a 90% reduction in incomplete field entries.
5. **Hierarchical Role-Based Access Control**
   * **Deliverable**: Role-based permissions enabling owners to view employer and worker records, and employers to view worker records.
   * **Measurement**: Correct data visibility and restriction by role, ensuring secure data access and a 100% adherence to defined access protocols.
6. **Improved Inventory and Customer Demand Forecasting**
   * **Deliverable**: Reports on the most-purchased rice types and monthly sales trends.
   * **Measurement**: Consistent, actionable insights into customer demand patterns, with reports generated weekly and monthly.

**Salesforce Key Features and Concepts Utilized:**

 **Reporting and Dashboards**

* Generate daily reports on rice quantities processed, sales volumes, revenue, and customer purchasing patterns.
* Provide analytics to track popular rice types and customer demand.
* Facilitate data-driven decisions with easy-to-interpret dashboards.

 **Rollup Summary Fields**

* Summarize child object data, such as total rice quantities supplied by each supplier, displayed on the parent supplier object.
* Leverage COUNT, SUM, MIN, and MAX functions for high-level data insights.

 **Cross-Object Formula Fields**

* Calculate total payments by multiplying the rice quantity taken with the price per kilogram.
* Display payment totals automatically, simplifying accounting and payment tracking.

 **Validation Rules**

* Enforce data integrity with validation rules like the ISBLANK formula, ensuring necessary fields are filled before submission.
* Display error messages to users when rules are not met, reducing data entry errors.

 **Permission Sets**

* Set Organization-Wide Defaults (OWD) to maintain controlled data access.
* Define roles allowing hierarchical access: the owner views employer and worker data, while employers view worker records.

**Detailed Steps to Solution Design:**

 **Entity Identification:**

* **Rice Inventory**: Stores data on rice types, quantities, and prices.
* **Sales Transactions**: Captures daily sales, linking sold rice types, quantities, and prices.
* **Suppliers**: Manages supplier details and rice quantities supplied.
* **Customers**: Maintains customer purchase history and preferences.

 **Relationships:**

* **Master-Detail Relationship**: Link Sales Transactions (child) to Customers (parent), and Rice Inventory (child) to Suppliers (parent).

**Fields:**

* **Rice Inventory**: Rice Type, Available Quantity, Price per kg
* **Sales Transactions**: Date of Sale, Quantity Sold, Total Revenue
* **Suppliers**: Supplier Name, Contact Details, Total Quantity Supplied
* **Customers**: Customer Name, Purchase History, Total Amount Spent

**Business Logic and Automation**

**Goal:** Automate essential tasks like data calculations, rollups, validations, and reporting to ensure accuracy and efficiency.

* **Rollup Summary Fields**:
  + On the Supplier object, create a rollup summary field to display the total quantity of rice supplied by each supplier.
* **Validation Rules**:
  + Apply ISBLANK validation rules on critical fields (e.g., Quantity Sold and Rice Type in Sales Transactions) to ensure no essential data is missing.

**Screenshots:**

<https://drive.google.com/drive/folders/1y8mpePY5DiL8tES1hokbnGcEy_1rzX7a?usp=sharing>

**Testing and Validation:**

**1. Testing Phases**

* **Unit Testing**
  + Objective: Validate individual components, fields, formulas, and custom logic.
  + Scope: Test each feature independently, such as rollup summary fields, cross-object formulas, validation rules, and permissions.
  + Approach: Test each field with positive and negative test cases (e.g., validate ISBLANK formula with empty and non-empty fields to ensure accurate error handling).
* **Integration Testing**
  + Objective: Ensure that different components within the CRM work seamlessly together.
  + Scope: Test workflows involving multiple objects (e.g., Sales Transactions linked to Rice Inventory and Customers).
  + Approach: Execute end-to-end processes, such as creating a sales transaction, checking rollup summaries for inventory updates, and verifying related customer records.
* **System Testing**
  + Objective: Verify that the entire CRM application meets functional and non-functional requirements.
  + Scope: Test across all functionalities, including reporting, dashboards, and automated notifications.
  + Approach: Conduct a complete walkthrough of typical business scenarios (e.g., daily sales entry, generating inventory reports) to validate overall functionality and performance under expected loads.
* **User Acceptance Testing (UAT)**
  + Objective: Ensure the application meets the business needs and end-user expectations.
  + Scope: Test with real user scenarios to validate usability and confirm alignment with business goals.
  + Approach: Engage stakeholders, including owners and staff, to perform tasks as per their roles, verify that reports are accurate, and confirm that access permissions work as expected.

**2. Testing and Validation Scenarios**

* **Field-Level Validation**
  + Test mandatory fields (e.g., Quantity Sold in Sales Transactions) with and without values to ensure that validation rules (e.g., ISBLANK) trigger error messages accurately.
* **Formula and Calculation Validation**
  + Test cross-object formula fields for correct calculations, such as verifying that the Total Payment field accurately multiplies Quantity Sold by Price per kg.
  + Validate rollup summary fields to ensure they accurately display total quantities or values for each supplier.
* **Access and Permissions Testing**
  + Test role-based access to confirm that owners can view all records, while employers can view only relevant worker records.
  + Ensure restricted users cannot access data beyond their roles.
* **Reports and Dashboards Validation**
  + Verify that all dashboard components display correct data, such as daily sales totals, revenue, and inventory status.
  + Test report accuracy by comparing manual calculations with system-generated values.
* **Automated Workflow Testing**
  + Validate automated daily email reports, confirming they include accurate sales data and inventory levels.
  + Test alert triggers for inventory thresholds to ensure notifications are sent promptly.

**3. Tools for Testing**

* **Salesforce Testing Tools**
  + **Salesforce Inspector**: For validating data across records, especially during field and formula testing.
  + **Developer Console**: To run SOQL queries and confirm relationships and rollup data accuracy.

**Key Scenarios Addressed by Salesforce in the Implementation Project:**

**1. Daily Sales Tracking and Reporting**

* **Scenario**: The rice mill needs to track daily rice sales by type, quantity, and revenue generated.
* **Salesforce Solution**: Salesforce enables daily tracking through Sales Transactions records linked to Rice Inventory. Owners can view real-time updates on quantities sold and revenue generated, with dashboards displaying sales data in an accessible visual format. Automated reports are generated and sent to owners at the end of each day, providing daily summaries for review.

**2. Supplier Management and Inventory Monitoring**

* **Scenario**: The mill requires a way to monitor rice stock levels, manage supplier information, and ensure timely reordering based on inventory needs.
* **Salesforce Solution**: Through the Supplier and Rice Inventory objects, Salesforce allows the rice mill to track the total quantity of rice supplied by each supplier. Rollup summary fields calculate total rice quantities received, and automated alerts notify owners when inventory levels fall below a set threshold, enabling timely reordering and preventing stockouts.

**3. Customer Relationship and Sales History Management**

* **Scenario**: The rice mill wants to manage customer details, track purchasing patterns, and identify top customers.
* **Salesforce Solution**: Salesforce’s Customer object stores detailed customer information and purchase history, linking each customer to related Sales Transactions. Reports and dashboards provide insights into customer buying patterns, helping the mill understand which customers purchase the most rice, which types are in demand, and when purchases are most frequent, thereby aiding in personalized marketing and customer retention strategies.

**4. Role-Based Access Control for Data Security**

* **Scenario**: Different personnel at the rice mill need access to different data based on their roles. The owner should view all records, while employers should only access records relevant to their roles.
* **Salesforce Solution**: Using role hierarchies and Organization-Wide Defaults (OWD), Salesforce allows the application to restrict access based on roles. Owners can see data across all objects, while employers are restricted to view only worker and sales data that pertain to their role. This secure, role-based access ensures data privacy and complies with organizational access policies.

**5. Automated Financial Calculations for Accurate Invoicing**

* **Scenario**: The rice mill needs automated calculations for transaction totals to simplify invoicing and payment processing.
* **Salesforce Solution**: Salesforce formula fields calculate the Total Payment for each transaction by multiplying the quantity of rice sold by the price per kilogram. This automation ensures accuracy in financial data, eliminates manual calculations, and allows easy viewing of financial information directly within the Sales Transactions object, improving accounting efficiency.

**6. Validation Rules to Ensure Data Quality and Consistency**

* **Scenario**: The rice mill must ensure that all necessary fields are filled accurately, such as Quantity Sold and Rice Type, to maintain high data quality.
* **Salesforce Solution**: Salesforce’s validation rules, like the ISBLANK rule, prevent incomplete or incorrect data entries by triggering error messages when critical fields are left blank or entered incorrectly. This ensures consistent and reliable data entry across all records, improving the accuracy of reports and analytics.

**Conclusion:**

**Summary of Achievements:**

The implementation of the Rice Mill CRM Application on Salesforce has successfully transformed the rice mill’s operations by centralizing data, enhancing efficiency, and enabling data-driven decision-making. The following key achievements highlight the project’s impact:

1. **Enhanced Daily Operations**: The CRM system now provides real-time tracking of rice production, sales, and revenue, with automated daily reports delivered to the owners. This streamlines the daily management of rice inventory and sales, freeing staff from manual record-keeping.
2. **Accurate Inventory and Supplier Management**: The application tracks rice stock levels and supplier data through integrated rollup summaries and automated alerts, ensuring inventory is always aligned with production and demand.
3. **Improved Customer Relationship Management**: By storing detailed customer profiles and purchase histories, the CRM empowers the rice mill to analyze customer purchasing patterns, identify top customers, and improve customer satisfaction through personalized service.
4. **Secure, Role-Based Access Control**: Role-based permissions enable secure data access, allowing each user to view only the data relevant to their role, ensuring data confidentiality and compliance with organizational access policies.
5. **Automated Financial Calculations**: Formula fields automate financial calculations for each sales transaction, enabling precise invoicing and easy-to-track payment records.
6. **Data Quality Assurance**: Validation rules enforce data consistency and accuracy, reducing errors and ensuring that all entries are complete, leading to more reliable reports and analytics.

The successful completion of this project has provided the rice mill with a powerful, scalable CRM solution tailored to its unique needs. This application enhances operational efficiency, supports strategic decision-making, and improves customer engagement, setting a foundation for sustainable growth and continued success.