**E-Bike Rental Hub**

**A modern, data-driven CRM for E-Bike Rental operations**

### **Project Overview**

The **CRM Application for Managing E-Bike Rentals** is a Salesforce-based solution tailored for e-bike rental businesses to manage bookings, customer details, and pricing efficiently. This system allows for real-time tracking of rental bikes, rental duration, and billing within Salesforce. It's designed to handle high transaction volumes while ensuring accuracy in bike availability and customer engagement.

### **Purpose**

E-bike rental services face challenges in tracking bike availability, managing rental durations, and billing customers accurately. This application addresses these issues by:

* **Tracking Customer Bookings**: Records each rental, linking bookings to customers and specific e-bikes.
* **Automating Rental Pricing**: Calculates costs based on rental duration and bike type, ensuring easy, accurate billing.
* **Managing E-Bike Availability**: Updates bike status in real-time to prevent double bookings and improve inventory oversight.
* **Providing Customer Insights**: Sales teams access customer preferences and history, improving service and optimizing stock for popular rental durations.

This CRM solution streamlines e-bike rentals, enhancing service quality and operational efficiency for rental businesses.

### 

### 

### **Key Features**

1. **Customer Management**
   * Stores customer details, such as contact info and rental history, enabling personalized service and quick access to prior rentals.
2. **E-Bike Inventory Management**
   * Tracks e-bike models, availability, and pricing in real time, supporting efficient stock control and avoiding double bookings.
3. **Rental Processing and Management**
   * Manages rentals by linking them to customers and specific e-bikes, automating price calculations based on duration and bike model.
   * Updates bike availability instantly, keeping accurate counts.
4. **Automation and Calculations**
   * Automates cost calculations, reducing billing errors, and adjusts e-bike inventory in real time for improved accuracy.

### **Objectives**

* **Enhance Billing Accuracy:** Automate rental cost calculations based on duration and bike model, ensuring accurate invoicing.
* **Optimize Inventory Management:** Track bike availability in real time, alerting staff when maintenance or recharges are due.
* **Streamline Operations:** Centralize customer, bike, and rental data within Salesforce, reducing reliance on manual processes.
* **Support Business Growth:** Easily scalable to manage increasing rental volumes, bike models, and customer profiles, accommodating business expansion with minimal reconfiguration.This ensures operational efficiency and improved customer service.

### 

### 

### **Users and Roles**

* **Rental Agents:** Handle customer inquiries, manage bookings, and access rental histories.
* **Fleet Managers:** Oversee e-bike availability, schedule maintenance, and view inventory reports.
* **Finance Team:** Access accurate rental totals and manage customer billing.
* **Business Management:** Review rental performance, customer trends, and inventory data to inform business strategies.

These roles ensure efficient service, maintenance planning, accurate billing, and data-driven decision-making for the e-bike rental business.

### 

### **Benefits of the CRM Application**

### **Increased Operational Efficiency:** Automates the booking process and inventory management, streamlining workflows and saving time.

**Minimized Errors:** Reduces pricing discrepancies with automated calculations, ensuring customer orders are billed correctly.

**Boosted Customer Experience:** Accurate information enhances service quality, enabling tailored interactions based on rental history.

**Actionable Insights:** Provides valuable data analytics for better demand forecasting and inventory management.

**Flexible Scalability:** Seamlessly grows with the business, easily accommodating more data and features as needed.

### 

### **Example Workflow**

1. **Customer Order Placement:**
   * A rental agent selects a customer and an e-bike model in Salesforce.
   * They input the rental duration, and the system automatically calculates the total cost based on the model's rental price.
2. **Order Confirmation and Inventory Update:**
   * Upon confirmation, the application updates the e-bike's availability, reflecting the new rental.
   * Fleet managers receive alerts for any necessary maintenance or charging requirements.
3. **Review and Reporting:**
   * Rental, customer, and inventory data is accessible through Salesforce reports, helping teams analyze trends and manage stock effectively.

**Logo**

****

### 

### **Summary**

The E-Bike Rental Hub CRM streamlines the rental process by integrating customer, inventory, and order management into a single platform. It automates billing and inventory tracking, enhancing operational efficiency and customer satisfaction. Built on Salesforce, it is scalable to accommodate business growth while ensuring accurate transactions and improved service delivery, tailored specifically for the e-bike rental industry

### **Objectives**

The CRM aims to streamline booking processes for faster transactions, ensure accurate tracking of bike availability, enhance customer satisfaction through timely updates, and automate billing to reduce operational costs. It also facilitates data-driven decisions by providing insights into rental trends.

### **Business Goals**

1. **Enhance Booking Efficiency**: Streamline order management to speed up processing and prioritize customer relationships.
2. **Improve Inventory Management**: Monitor e-bike availability in real-time to avoid overbooking and delays in maintenance.
3. **Boost Customer Loyalty**: Provide reliable service and timely updates, fostering trust and repeat business.
4. **Lower Operational Costs**: Reduce manual tasks through automation to decrease overall expenses.
5. **Support Informed Decision-Making**: Offer comprehensive reports on rentals and customer trends for strategic planning.

**Specific Outcomes**

**Streamlined Order Management**:

* **Deliverable**: An efficient order placement system with automated total calculations.
* **Outcome**: Faster processing, fewer calculation errors, and improved turnaround times, leading to enhanced customer service through quick access to records and historical data for personalized interactions.

**Real-Time Inventory Tracking**:

* **Deliverable**: Automatic stock updates reflecting each order placed.
* **Outcome**: Enhanced inventory accuracy, timely reordering, and reduced risk of overstocking or stockouts.

**Centralized Customer Data Management**:

* **Deliverable**: A unified platform for customer profiles, contact details, and order history.
* **Outcome**: Improved customer interactions and better service personalization.

**Automated Reporting and Analytics**:**Deliverable**: Configurable reports tracking rental volumes, usage trends, and customer preferences.

**Outcome**: Managers gain valuable insights into performance metrics, guiding strategic decisions and enhancing overall business intelligence.

**Enhanced User Experience**:

* **Deliverable**: User-friendly tabs and layouts in Salesforce for easy navigation.
* **Outcome**: Improved usability for sales and inventory teams, reducing the learning curve and boosting productivity.

**Effective Communication**:

* **Deliverable**: Integrated communication tools for managing customer inquiries and feedback.
* **Outcome**: Strengthened relationships with customers, resulting in higher satisfaction and retention rates.

### 

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

This project leverages key Salesforce features to build an efficient, scalable CRM tailored for managing e-bike rentals. Core features enable automation, real-time inventory tracking, data organization, and accessibility to enhance the rental experience. With custom objects like *Total EBikes*, *EBike Bookings*, *Consumer*, and *Billing Process*, this system is designed to streamline booking, manage customer and inventory data, and facilitate accurate billing, ensuring reliable service and better operational insights.

#### **Key Salesforce Features**

1. **Custom Objects**
   * **Purpose:** Custom objects such as *Total\_EBikes*, *EBike\_Bookings*, *Consumer*, and *Billing\_Process* store specialized data relevant to e-bike rentals.
   * **Impact:** Enables organized data management, tracking consumer profiles, available e-bikes, and rental history for seamless operations.
2. **Object Relationships (Lookup Relationships)**
   * **Purpose:** Links between *Consumer* and *EBike\_Bookings*, and *Total\_EBikes* and *EBike\_Bookings*.
   * **Impact:** Connects each booking to both a consumer and specific e-bike model, ensuring streamlined data access, reducing redundancy, and simplifying report generation.
3. **Formula Fields**
   * **Purpose:** Formula fields on *EBike\_Bookings*, like *Total\_Rental\_Cost*, automate rental fee calculations based on bike type and rental duration.
   * **Impact:** Reduces manual errors, ensures accurate invoicing, and provides real-time cost data for rentals.
4. **Validation Rules**
   * **Purpose:** Ensure accuracy by setting data requirements, such as preventing overbooking of e-bikes currently rented out.
   * **Impact:** Maintains rental availability, prevents invalid bookings, and ensures data consistency.
5. **Automated Workflows and Process Builder**
   * **Purpose:** Automates tasks, such as notifications when a bike requires maintenance after several bookings.
   * **Impact:** Reduces manual tasks, prompts timely maintenance, and supports continuous bike availability.
6. **Reports and Dashboards**
   * **Purpose:** Customized reports and dashboards track metrics like rental volumes, e-bike availability, and customer usage patterns.
   * **Impact:** Enables data-driven decision-making, allowing management to anticipate demand and optimize e-bike allocation.
7. **Page Layouts and Tabs**
   * **Purpose:** Customized layouts and tabs for *Consumer*, *EBike\_Bookings*, and *Billing\_Process* simplify navigation and data entry.
   * **Impact:** Enhances user experience, reducing learning time for the team and boosting productivity.
8. **Security and Sharing Settings**
   * **Purpose:** Object and field-level security restricts access to sensitive data like consumer details and billing records.
   * **Impact:** Ensures compliance, safeguarding customer data, and controlling access based on user roles.

This CRM model aligns with the needs of an e-bike rental business, enhancing booking efficiency, inventory control, and customer satisfaction through data-driven and secure management.

### **Salesforce Concepts**

1. **Data Integrity and Validation**: Ensuring that reliable data is entered across the system is critical. Validation rules, picklists, and relationships help maintain accurate records for rentals, customers, and billing.
2. **Automation and Efficiency**: Using Process Builder, workflows, and formula fields automates tasks like rental cost calculations and inventory tracking, reducing manual errors.
3. **Scalability and Customization**: Custom objects and fields allow the application to expand seamlessly, adding new bike models, customer data, and rental options as needed.
4. **User Accessibility and Experience**: Custom tabs, layouts, and a streamlined data model create an intuitive interface, allowing users to quickly access bookings, inventory, and billing details for efficient operations.

**1. Detailed Steps to Solution Design**

The data model includes four main custom objects—**Consumer, Total E-Bikes, E-Bike Bookings, and Billing Process**—each designed to manage specific aspects of the rental business. Here’s how they interact:

**1.1 Consumer Object**

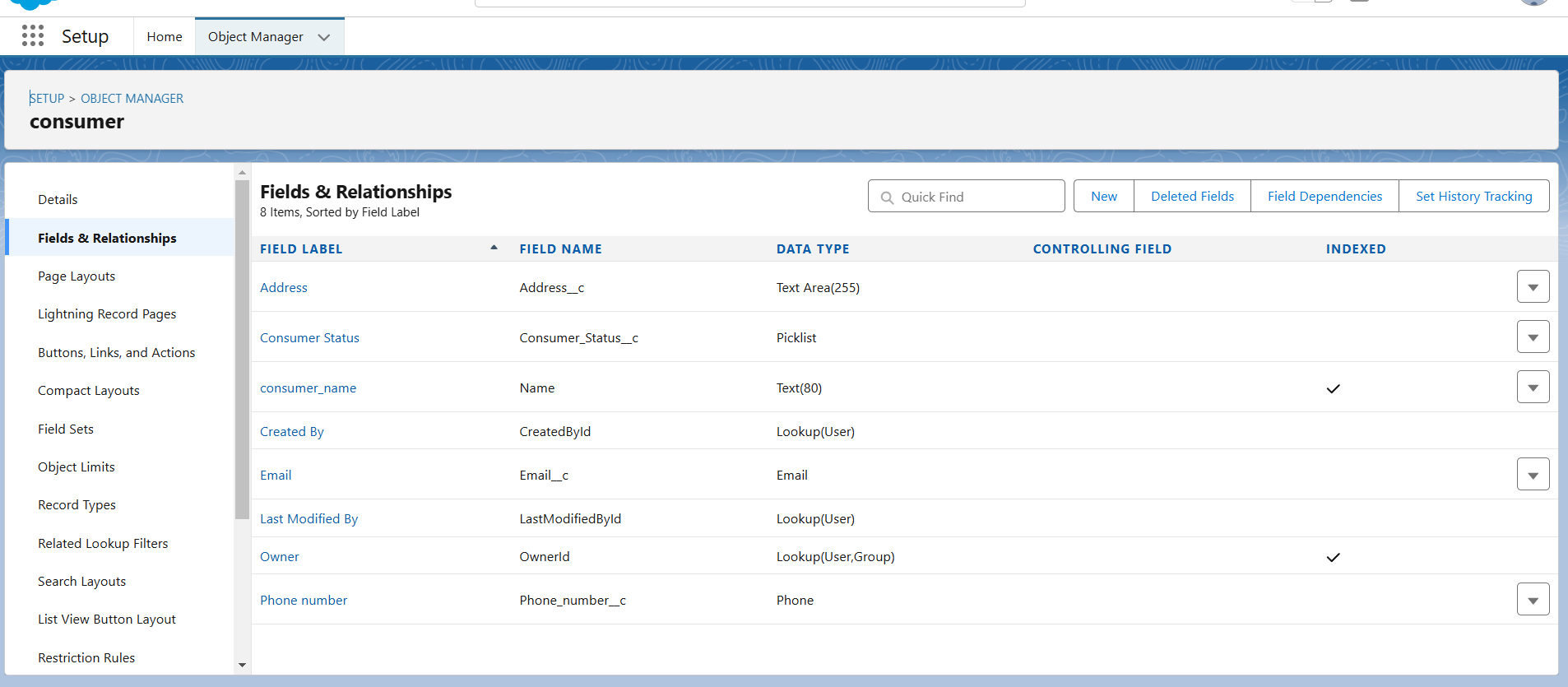
* **Purpose:** It stores customer details and history.
* **Key Fields:**

**Name**(Standard)

**Email**(Email)

**Phone**(Phone)

**Address**(Text Area)



**1.2 Total E-Bikes Object**

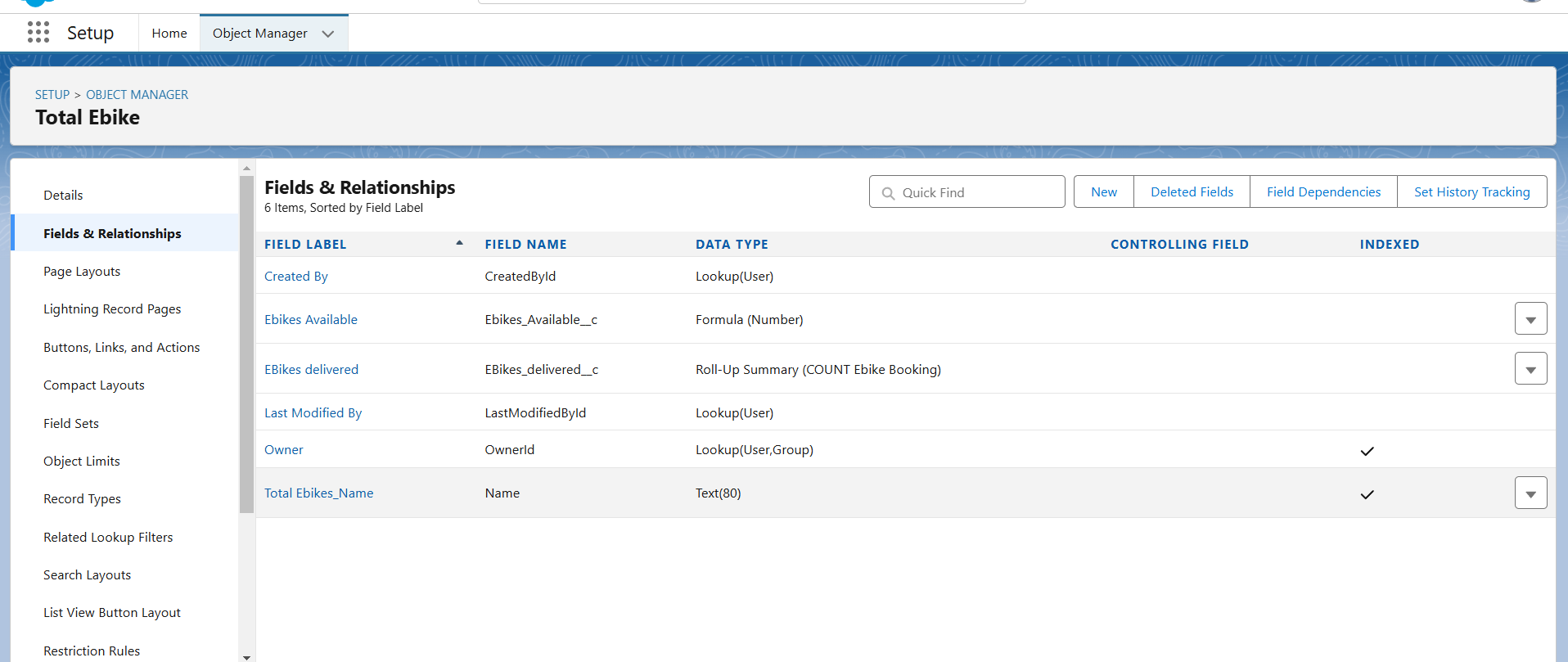
* **Purpose:** It maintains e-bike inventory, tracking availability and maintenance.
* **Key Fields:**

**Name**(Standard)

**Ebikes Available** (Number)

**Ebikes delivered** (Number)

**Unit Price** (Currency)

****

**1.3 E-Bike Bookings Object:**

* **Purpose:** Manages rental records, linking bikes to customers.
* **Key Fields:**

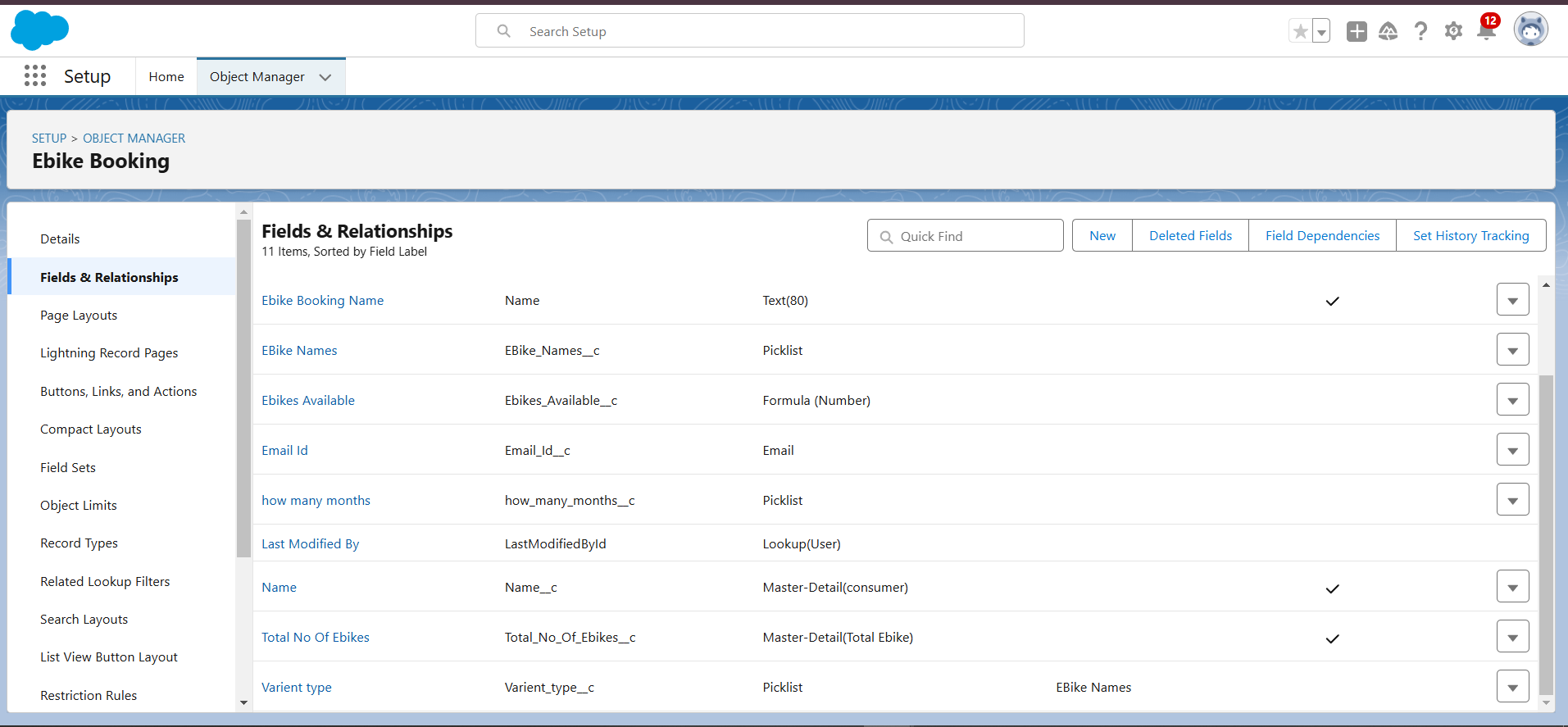
**Variant Type** (Picklist)

**Total No Of Ebikes** (Number)

**Name** (Standard)

**Email Id**( Email)

**How many months** (picklist)



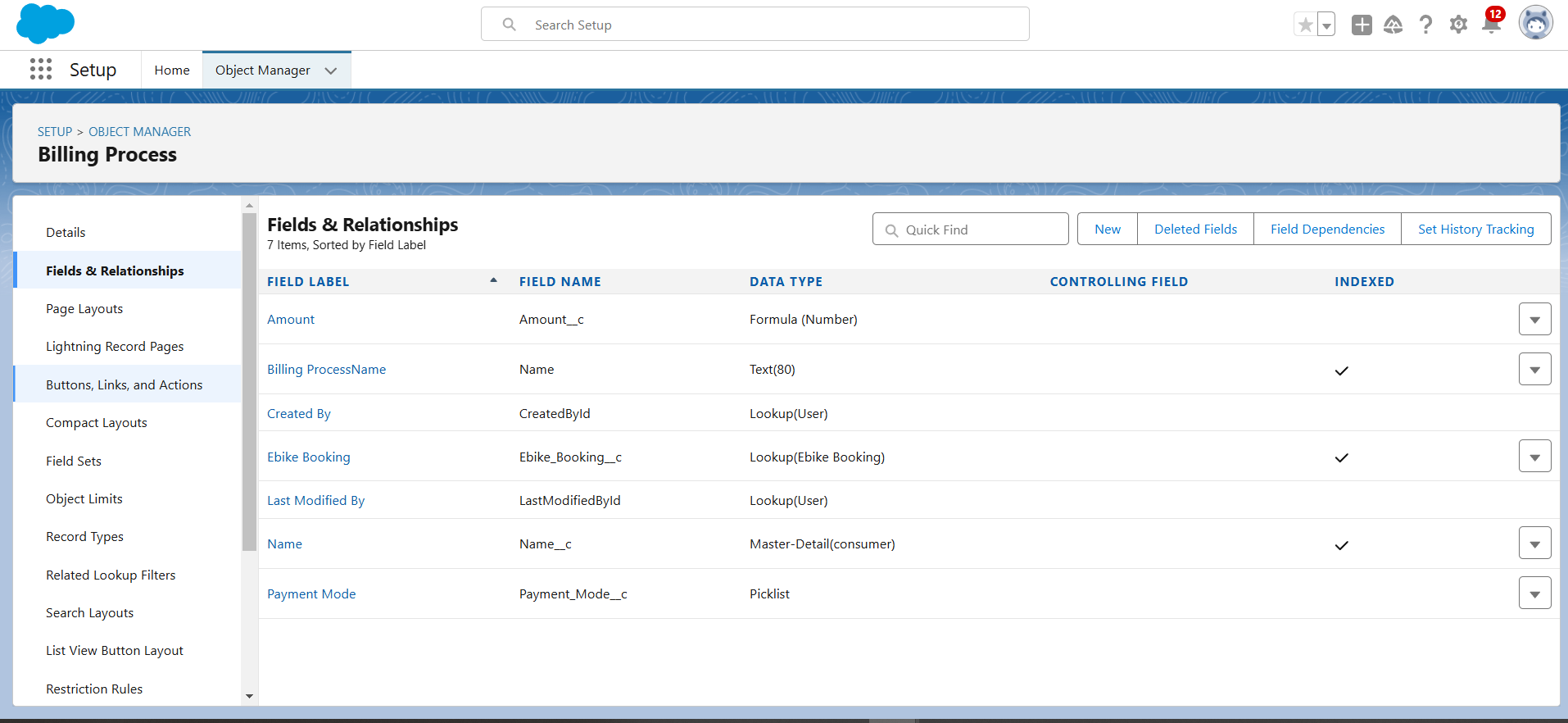
**1.4 Billing Process Object:**

* **Purpose:** Calculates costs based on duration and model, handling invoicing.Each object is linked, providing streamlined access to related records for efficient rental management.
* **Key Fields:**

**Billing ProcessName** (Standard)

**Payment Mode** (Picklist)

**Ebike Booking** (Lookup to EBike Booking)

****

**2. User Interface Design**

The UI includes custom tabs and layouts for each object, allowing users to access and interact with records in a structured format.

**2.1. Custom Tabs**

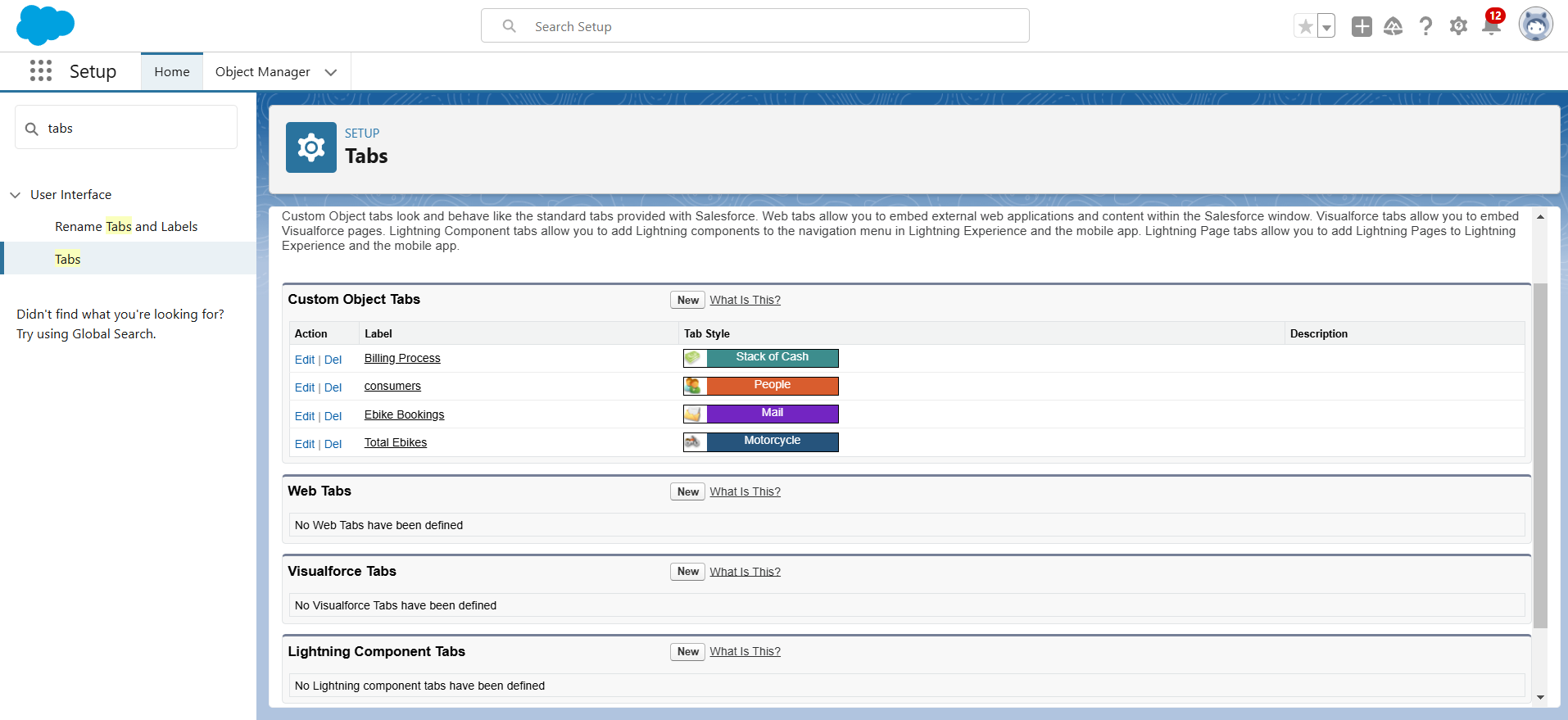
* **Tabs Created:**

**Billing Process Tab:** For viewing Billing Details

**Consumer Tab:** For viewing customer details and history.

**Ebike Booking Tab:** For booking E-bikes and to view the availability of e-bikes.

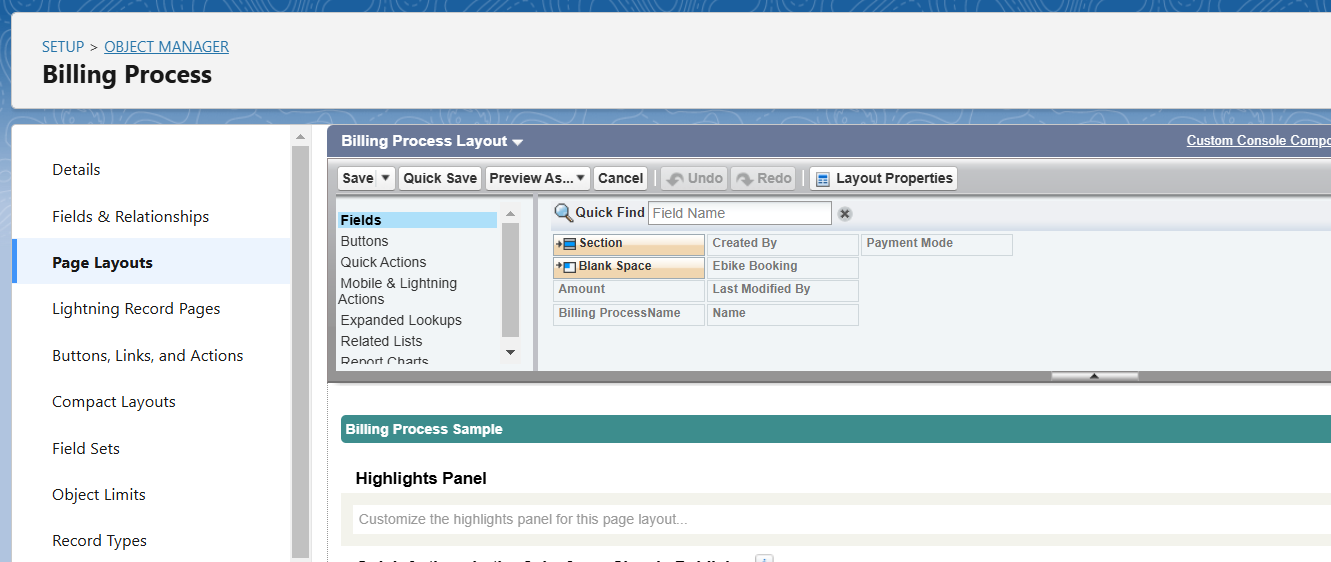
**Total E-Bikes:** To view the availability of e-bikes.

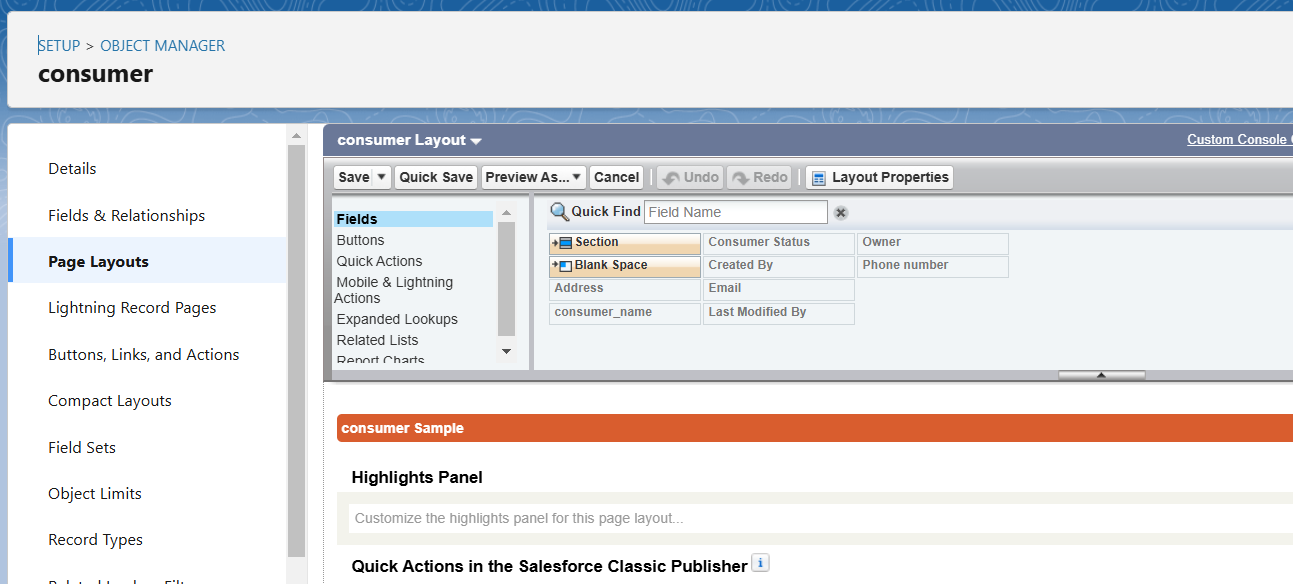
****

**2.2. Page Layouts:**

Custom page layouts were configured for each object to display relevant fields in a logical order and to enhance the user experience.

* **Consumer Page Layout:** It displays the consumer details like their status,address,name,email,phone number.
* **Billing Process:** It displays the amount,payment mode,ebike booking,name,and billing name.

****

****

**3. Business Logic Design**

The business logic includes formula fields, validation rules, and automated workflows to handle stock updates, order totals, and low stock alerts.

**3.1 Formula Field: Total Amount on Billing Process**

**Purpose:** Automatically calculates the total amount for an e-bike booking based on the number of months rented and the price per month.

**Formula: how\_many\_months\_\_c \* Ebike\_Booking\_\_r.rate\_Per\_Month\_\_c**

**3.2. Validation Rule: Ensure Sufficient E-bikes Available**

**Purpose:** Prevents booking e-bikes if the requested quantity exceeds the available stock.

**Formula: how\_many\_months\_\_c > Ebikes\_Available\_\_c**

**3.2. Validation Rule: Ensure Sufficient E-bikes Available**

**Purpose:** Prevents booking e-bikes if the requested quantity exceeds the available stock.

**Formula: how\_many\_months\_\_c > Ebikes\_Available\_\_c**

(This ensures that the number of e-bikes requested for booking does not exceed the available e-bikes.)

**3.3. Workflow/Process Builder: Stock Update on Booking Confirmation**

**Purpose:** Reduces the **available e-bikes** count in the Total Ebike object whenever an e-bike booking is confirmed.

**Workflow Action:**

**Update Field:** Ebikes Available in the Total Ebike record**.**

**Formula:**Total\_Ebikes\_\_r.Ebikes\_Available\_\_c - how\_many\_months\_\_c

**3.4. Automated Low Stock Alert Workflow**

**Purpose:** Sends a notification to the inventory manager when the available e-bikes fall below a set threshold.The Automated Low Stock Alert Workflow is designed to proactively notify the inventory manager when the available e-bikes drop below a predefined threshold. This ensures timely awareness of stock levels, allowing for prompt reordering or management decisions. By automating this process, the business can minimize the risk of stockouts and maintain customer satisfaction.

**Testing and Validation**

**4.1 Unit Testing**

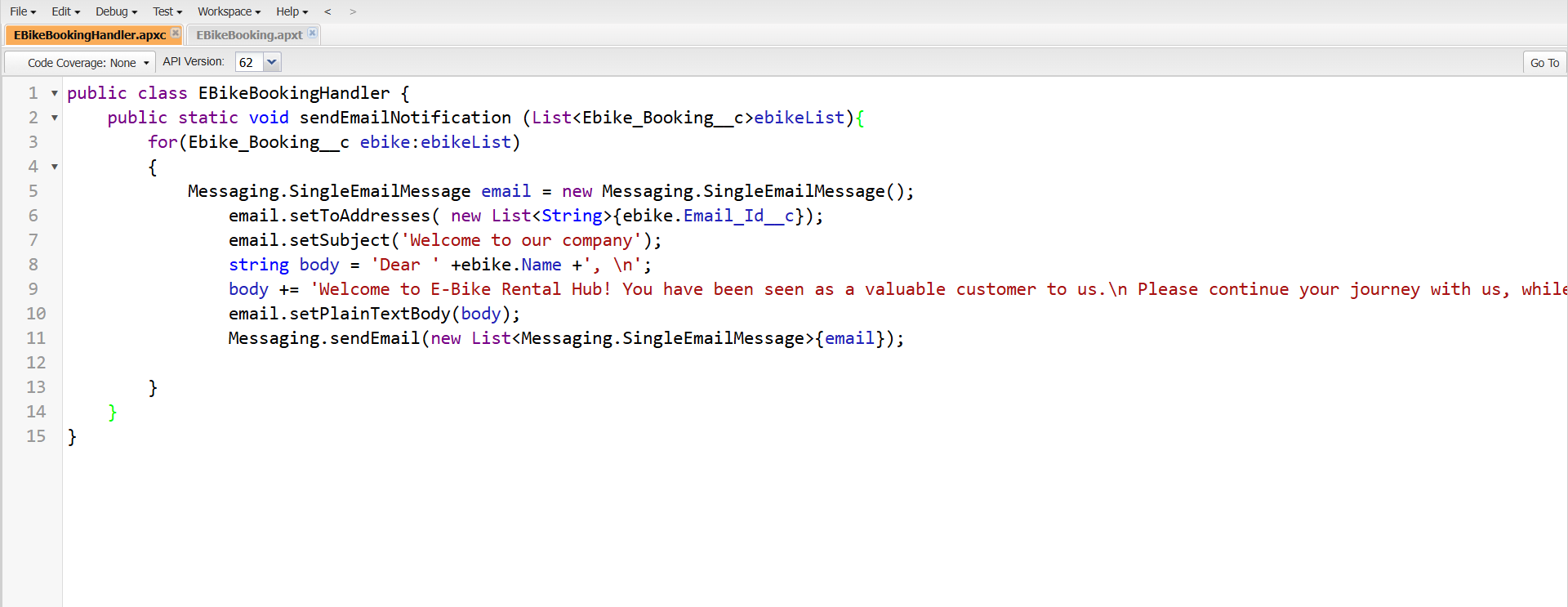
Apex is a strongly typed, object-oriented programming language that allows developers to execute flow and transaction control statements on the Lightning platform server in conjunction with calls to the Lightning Platform? API. Using syntax that looks like Java and acts like database stored procedures, Apex enables developers to add business logic to most system events, including button clicks, related record updates, and Visualforce pages. Apex code can be initiated by Web service requests and from triggers on objects.

**4.1.1 Apex Classes:**

Steps to create a class in APEX:

1. Login to the trailhead account and navigate to the gear account in the top right corner.
2. Then we can see the Developer console. Click on the developer console and you will navigate to a new console window.
3. Then you can see many tools in the Toolbar of the new console window. Click on File, New and Apex Class.
4. Enter the name of the class to create a new class file.

We created a Apex class names as **EBikeBookingHandler** and save it.

****

**4.1.2 Apex Triggers:**

A trigger is a set of Apex code that runs before or after DML(Data Manipulation Language) events.A DML event could be a variety of data processing tasks that include the standard insert, update, and delete commands.

With Apex triggers, you can automate tasks that would otherwise be nearly impossible to accomplish using only the Salesforce user interface. Triggers enable you to create custom scripts that you can implement according to your needs, and the only limitation is your coding skills.

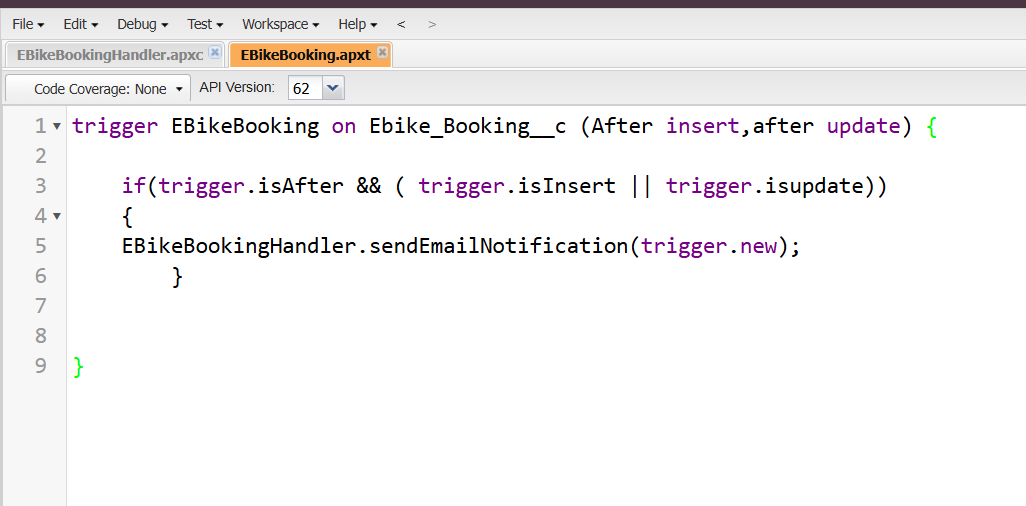
There are two Salesforce Apex trigger types:

**Before triggers**. These are helpful in cases that require a validation process before accepting a change. They run before any database changes. **After triggers**. These are helpful in cases where you need to modify your database records and when the necessary value is stored in other records.

How to create a new trigger :

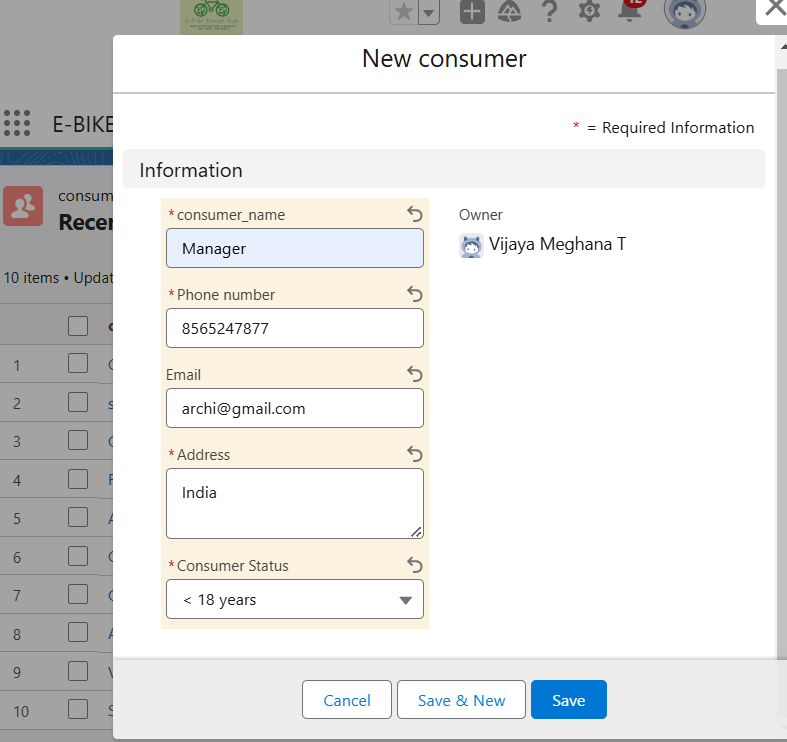
1. While still in the trailhead account, navigate to the gear icon in the top right corner.
2. Click on developer console and you will be navigated to a new console window.
3. Click on the File menu in the toolbar, and click on new- Trigger.
4. Enter the trigger name and the object to be triggered.

Here we created a Apex Trigger named as **EBikeBooking** and the sObject is **Ebike\_Booking\_\_c.**

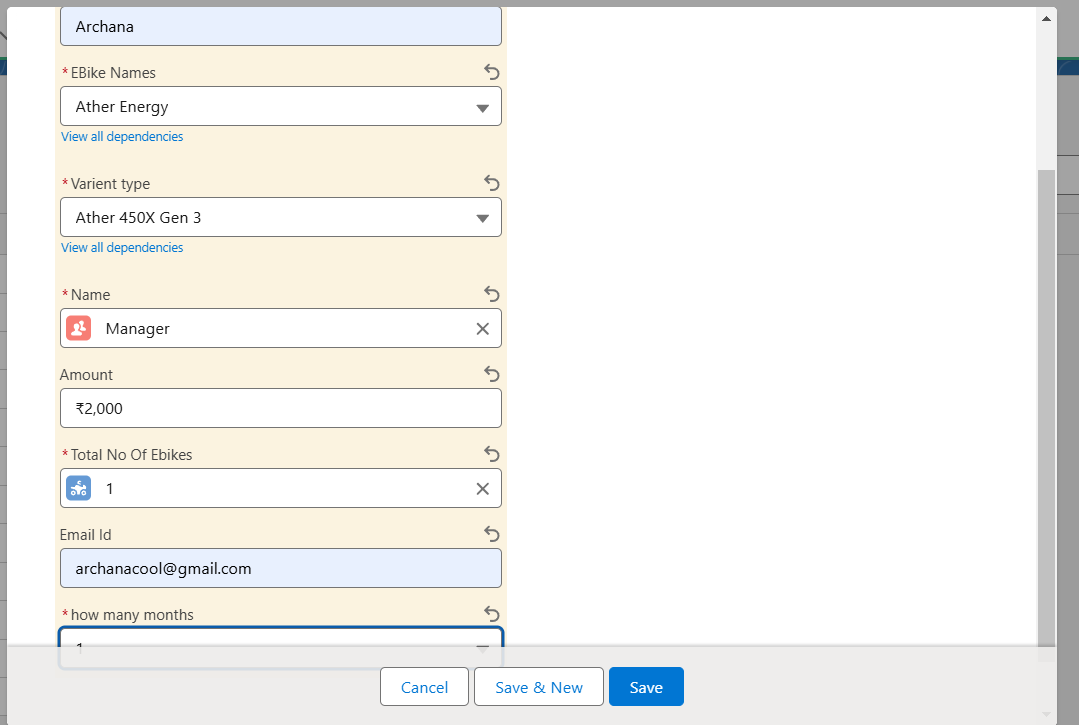
****

**4.2 User Interface testing**

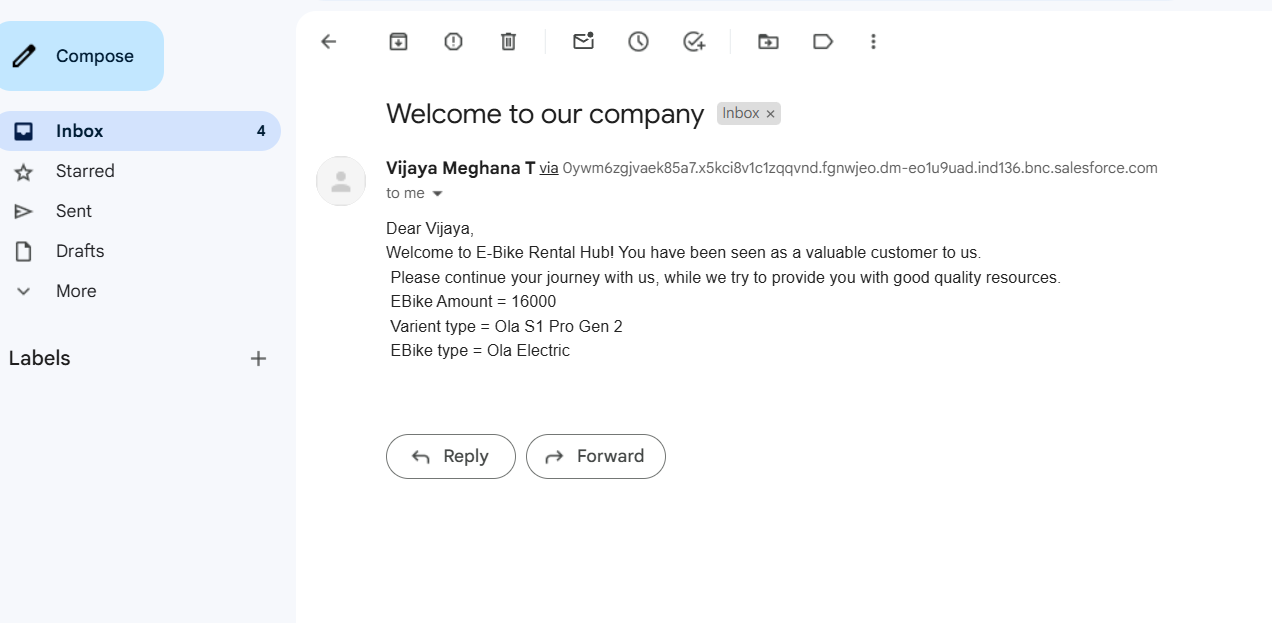
1. The consumers need to fill in the details to go to the next step as it is a required field.



1. Next, the users need to fill the booking name,and which bike do they need,its model and for how many months they are renting and many more.



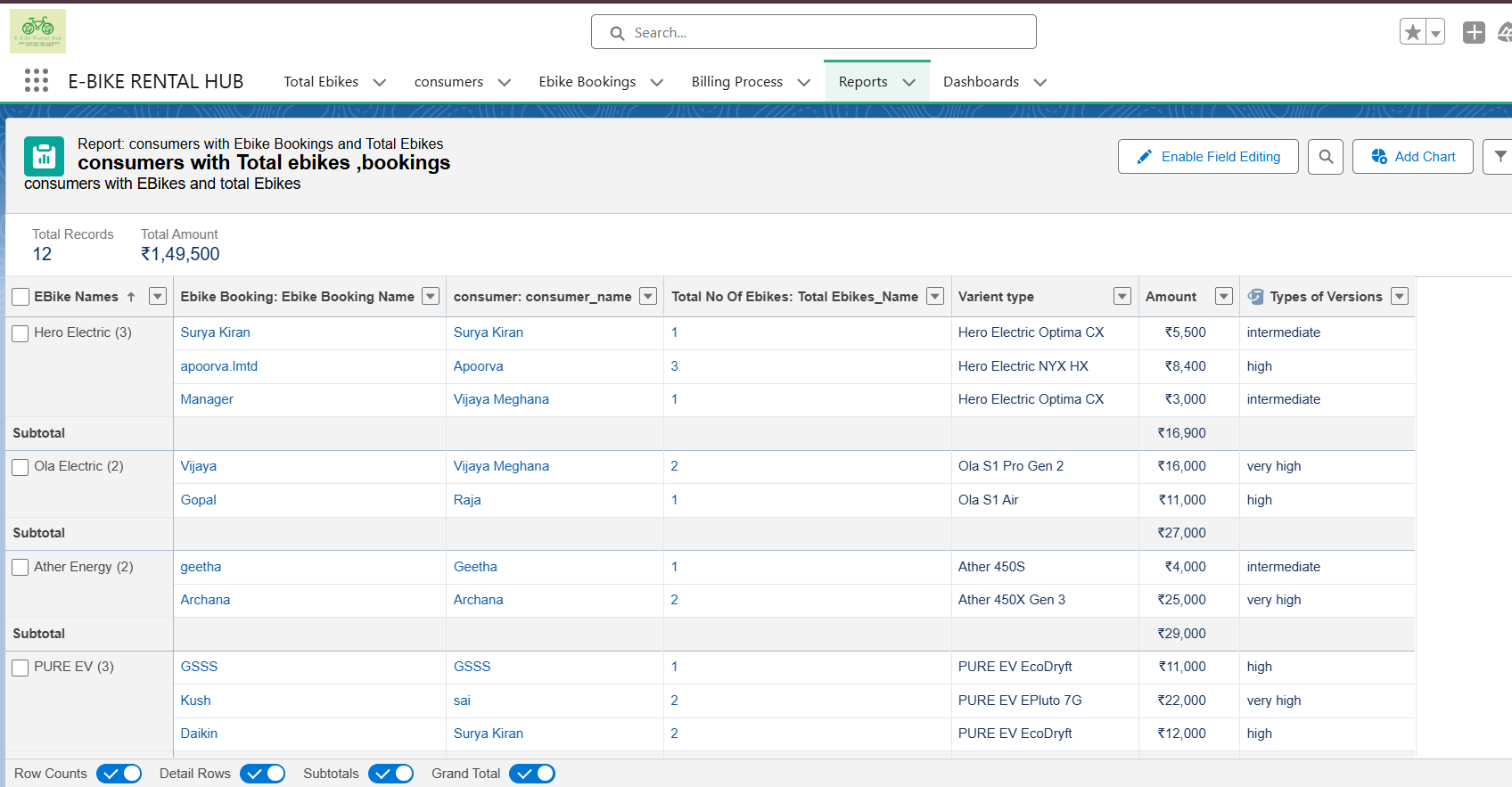
After filling all the necessary details the users/consumers will receive a mail letting them know about the booking.



**5. Key Scenarios Addressed by Salesforce**

**1. Booking Management  
*Scenario:*** Customers can easily search for e-bike availability, select rental duration, and confirm bookings. ***Salesforce Solution:*** Custom objects and workflows enable efficient booking management, with automated email confirmations and real-time updates on bike availability.

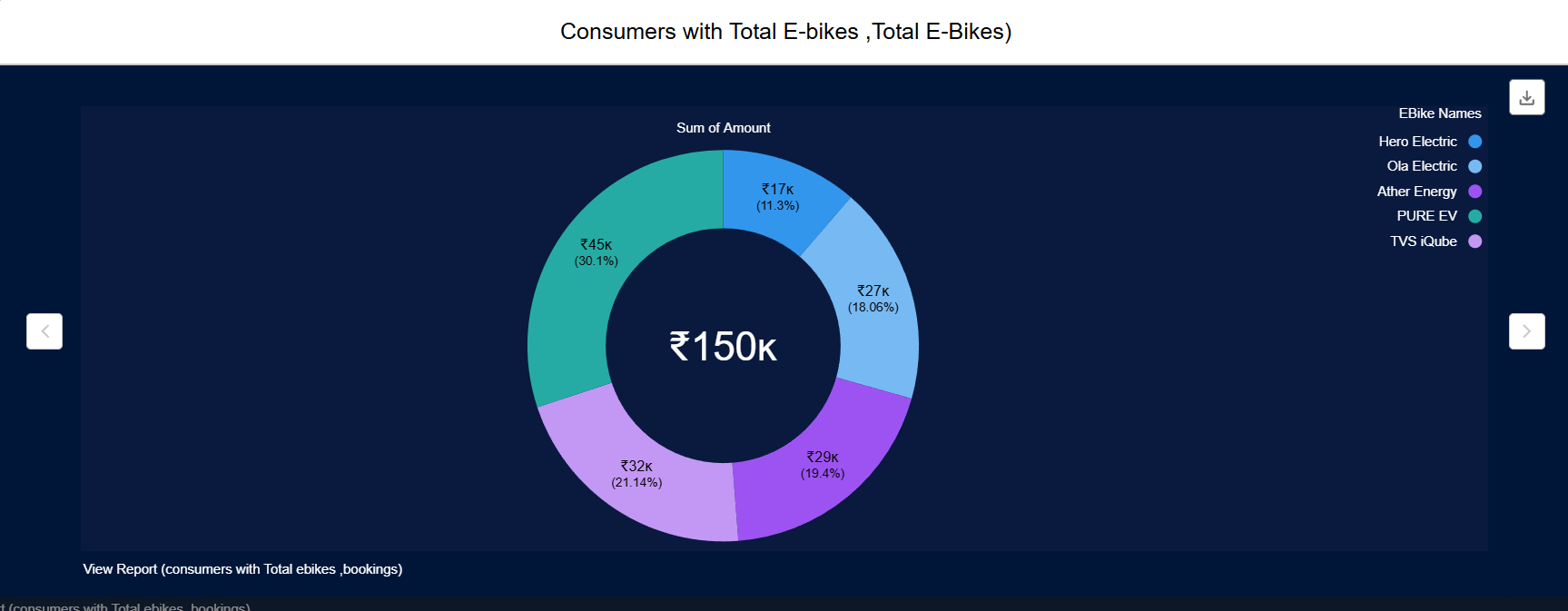
**2. Inventory Management  
*Scenario:*** Ensure bikes are always available and prevent overbooking by tracking inventory in real time.  
***Salesforce Solution:*** Automated inventory updates adjust stock with each booking and return, ensuring accurate availability data.



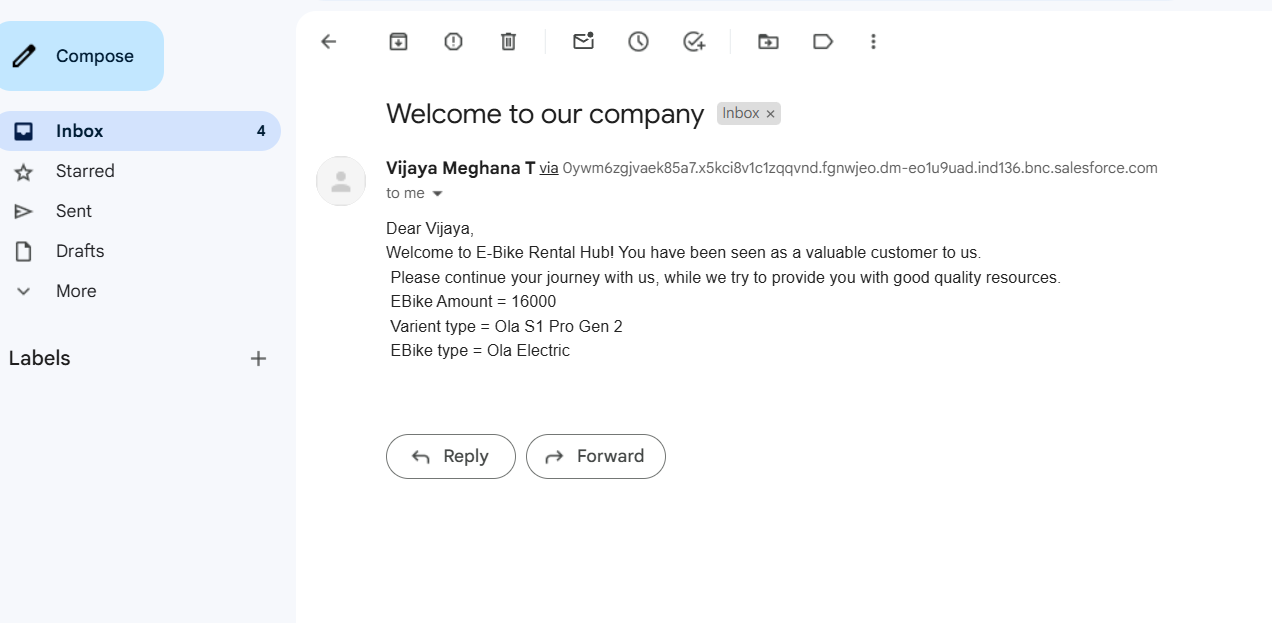
**3. Customer Relationship Management (CRM)  
*Scenario:*** Maintain a detailed database of customers, tracking booking history and preferences to support personalized service.  
***Salesforce Solution:*** Salesforce CRM tools capture customer data and interactions, allowing for targeted marketing and enhanced customer service.

**4. Payment Processing  
*Scenario:*** Enable secure payment options at the booking stage. ***Salesforce Solution:*** Integrate payment gateways to process transactions and automate invoicing for seamless billing.

**5. Reporting and Analytics  
*Scenario:*** Generate reports on booking trends, customer demographics, and turnover rates for informed decision-making.  
***Salesforce Solution:*** Salesforce reporting tools provide dashboards and insights, helping the management team track performance and adjust strategies.



**6. Automated Notifications  
*Scenario:*** Notify customers of booking confirmations, reminders for returns, and promotional updates.  
***Salesforce Solution:*** Automated emails and SMS notifications triggered by bookings and system updates improve customer engagement.



**7. User Access and Permissions  
*Scenario:*** Control access levels to secure sensitive data and restrict functionalities based on user roles.  
***Salesforce Solution:*** Configure role-based permissions, ensuring data privacy and limiting access according to role requirements.

**Conclusion**

The implementation of the E-Bike Rental Hub CRM project has successfully addressed key operational needs by integrating efficient booking management, real-time inventory tracking, and streamlined customer relationship management within Salesforce. This CRM system automates key workflows—such as booking confirmations, inventory updates, and customer notifications—significantly reducing manual effort and enhancing service quality. The project provides valuable insights through reports and dashboards, empowering data-driven decisions to support future growth. Overall, this solution establishes a scalable, user-friendly platform to improve both operational efficiency and customer satisfaction.

These achievements lay a strong foundation for future enhancements as the business expands.