

## **Case Study: Recycle4Change (R4C) - Enabling a Sustainable Recycling System**

### **1. Introduction:**

Recycle4Change (R4C) is a social enterprise initiative under Chance Creators, affiliated with the successful social enterprise "Fruit 2 Work" (F2W). R4C has partnered with TOMRA Cleanaway Victoria (TCV) to participate in the Victorian Government Container Deposit Scheme (CDS) by operating two automated depots (AD), scheduled to launch in November 2023. This initiative aims to establish a container recycling system modelled after the successful New South Wales CDS.

### **2. Business Model and Objectives:**

R4C has been contracted by TOMRA Cleanaway Victoria (TCV) to collect and sort containers in North Geelong and Hoppers Crossing regions. The primary objectives include reducing landfill and waste, employment opportunities, cleaner waterways, and contributing to the circular economy. The initial contract duration is 4 years, with a potential 5-year extension.

R4C will remain committed to its fundamental social enterprise mission, which involves offering avenues for employment and mentoring to individuals from diverse backgrounds. This includes those with lived experience of the justice system, as well as an expansion of its efforts to encompass juveniles and mothers seeking opportunities for re-entering the workforce or engaging in part-time employment while balancing childcare responsibilities.

### **3. Business Requirements:**

#### **3.1 Customer Registration and Management:**

- The software should provide a user-friendly interface for R4C to create and manage profiles for both commercial and residential customers.
- Customers should be categorized into 'Individual', 'Commercial', and 'Residential' types for efficient differentiation.
- 'Individual' or local customers can create an account and drop/deposit containers on their own in the automated depots (ADs) or recycle centres. Bins are not required for this type of customer. They are paid based on the count of items.
- 'Commercial' customers can register to become a participating organization. Then, R4C can actively visit them and collect their containers.
- 'Residential' customers can register and can order residential collection bins. These customers need to pay for the bin based on the size of the bin (280L or 660L) ordered.
- Each customer profile should include contact details (name, address, phone, email, etc.), billing preferences (payment methods), and specific bin requirements (bin size).

#### **3.2 Bin Management:**

- The system should enable R4C to track and manage the status of each bin assigned to customers.
- Bin details such as size and a unique identifier should be stored in the system.
- The software should allow for adding, modifying, and removing bins from customer profiles, with appropriate updates in the bin inventory.

#### **3.3 Truck Fleet Management:**

- Tools should be provided to manage the fleet of collection and distribution trucks.
- Each truck should be assigned a unique identifier, and the system should store information about its capacity and assigned driver.

- The software should track maintenance schedules, availability, and the route history for each truck.

### **3.4 Bin Collection and Distribution:**

- The system should allow the customers to notify when their bins are either full or nearing full capacity by uploading photos of the bin in the system.
- It should also provide features to assist in bin loading and unloading at customer locations, ensuring optimal operations.
- Real-time tracking of truck locations and route progress should be integrated, allowing efficient route adjustments.

### **3.5 Billing and Payment:**

- The system should be capable of calculating accurate customer bills based on the number of items collected for 'Individual' customers.
- 'Individual' customers will be paid instantly on the ADs based on selected payment methods (cash, direct debit, or bank transfer).
- Other customers will be paid based on the number of items after 5 business days after the collection of bins.
- Customers should have the ability to customize their billing preferences and preferred payment methods (cash, direct debit, or bank transfer).
- The software should generate clear and accurate invoices and receipts, reflecting the details of the services provided.

### **3.6 Donation and Charity:**

If a customer wants, they will be able to donate to a nominated charity of R4C a specified amount (i.e., 10%, 20%, 50%, or 100%) of a payment.

Customers will receive a Donation Tax Receipt for any donations over \$2.

### **3.7 Map Integration**

This feature should enable the 'Individual' customers to locate the nearest bin collection location (Hoppers Crossing or North Geelong) from their location.

- It also will show information on whether the facility is open or closed.
- Customers can route directions to the collection centres on the map.

### **3.8 Communication and Notifications:**

The system should facilitate seamless communication between R4C and its customers, which includes:

- automated notifications sent to customers prior to scheduled collection visits,
- providing updates on collection schedules and
- any service changes.

### **3.9 Reporting and Analytics:**

The system should feature a robust reporting and analytics module capable of delivering in-depth insights into various operational dimensions. Specifically, the system should have the ability to:

- Produce detailed reports on customer interactions, including their recycling patterns and billing histories.
- Generate financial summaries highlighting both income and charitable contributions.
- Create impact assessments that inform customers about their ecological savings, such as water and energy conserved, landfill space saved, and carbon emissions averted—these metrics should be available on a per-collection and historical basis.
- Present achievement-based reports, where customers can view badges or "green points" earned through their recycling efforts.
- Leverage analytics tools to offer actionable insights for optimizing collection routes, enhancing customer service, and boosting overall operational efficiency

### **3.10 User Roles and Access Control:**

Different user roles (administrator, driver, customer service representative, customer) should be implemented with varying levels of access.

Access control measures should ensure data security and privacy, allowing only authorized personnel to access specific information.

### **3.11 Integration and Scalability:**

The software should be designed with scalability in mind, accommodating future growth in customer base and operations.

The system should support integration with other software and systems as needed (e.g., accounting, route optimization, truck utilization, etc.).

## **4. Conclusion:**

By integrating these requirements, R4C can develop a comprehensive recycle management system that efficiently manages customer profiles, bin assignments, truck fleet operations, billing, communication, and reporting. The resulting software system will empower R4C to provide reliable and sustainable container collection services to a variety of customers while adhering to their social enterprise objectives.

### **What is your next step?**

Assume you are working as a database designer at Recycle4Change (R4C). Your current responsibility is to develop both the conceptual and logical models that will fulfil the data requirements of the software system. Specific details for these tasks are outlined in the assignment brief.

## **Bibliography**

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