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ENTERPRISE PROGRAMMING

(CSC584)

USER MANUAL

PROJECT TITLE:

KiTARAN - 3R Management System

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1.0 INTRODUCTION

The KiTARAN system is a comprehensive web-based platform developed to facilitate efficient management of recycling activities and promote the principles of 3R (Reduce, Reuse, Recycle). This digital platform was created to streamline the entire recycling request workflow, from initial submission by community members to verification and tracking by waste management administrators. The system eliminates traditional paper-based processes and provides a transparent, accountable mechanism for managing recyclable materials within the community.

1.1 System Overview

KiTARAN serves as an integrated digital solution that bridges the gap between community members seeking to recycle various materials and municipal waste management personnel responsible for collecting and verifying these materials. The platform operates through a user-friendly web interface accessible via standard web browsers, requiring no specialized software installation.

The system implements a structured workflow where users submit recycling requests through an online form, specifying the type and description of recyclable materials. These requests are then processed by administrators who verify the materials, record actual weights, and apply penalties when necessary for miscategorization. This systematic approach ensures accountability, promotes proper waste segregation, and encourages responsible recycling practices among users.

1.2 System Objectives

The KiTARAN system was developed to accomplish the following objectives for the waste management organization:

- **Provide Comprehensive Information Access**
 - Deliver detailed information about accepted recyclable material categories
 - Present clear guidelines on proper material categorization
 - Educate users on the environmental impact of recycling activities
 - Display system statistics promoting community engagement
- **Enable Digital Request Submission**
 - Allow users to submit recycling requests entirely online
 - Eliminate paper-based forms and manual processing
 - Provide immediate confirmation of request submission
 - Enable request tracking through user dashboard
- **Facilitate Transparent Verification Process**
 - Implement systematic verification workflow for administrators
 - Record actual weights of collected materials
 - Apply penalties for miscategorized items at RM 0.50 per kilogram
 - Maintain audit trail of all verification activities
- **Support Payment Processing**
 - Integrate payment gateway for penalty settlement
 - Display outstanding penalty amounts clearly to users
 - Provide transaction records and payment confirmation
 - Automatically update penalty status upon successful payment
- **Generate System Statistics**
 - Calculate total system-wide recycled weight
 - Track number of requests processed
 - Monitor pending requests requiring attention
 - Provide data for environmental impact reporting

- **Enhance Administrative Efficiency**
 - Centralize all request management in single dashboard
 - Implement filtering capabilities for request statuses
 - Streamline verification and penalty application processes
 - Reduce administrative overhead through automation

The system allows for complete digitization of all manual processes involved in community recycling programs and enhances the organization's capability to maintain accurate databases of recycling activities and environmental contributions.

1.3 Scope of the system

1. Recycling Request Workflow

- **Digital Submission:** The system facilitates the entire workflow from initial online submission by community members to final verification.
- **Material Categories:** It covers the management of four specific recyclable material categories: **Plastic, Paper, Metal, and Glass.**
- **Request Tracking:** Users can monitor the status of their requests through a personal dashboard, moving from "Pending" to "Verified" or "Penalty" status.

2. Administrative Verification and Management

- **Material Validation:** Administrators verify the authenticity of materials during collection and record actual weights.
- **Penalty Mechanism:** The system automatically applies a penalty of **RM 0.50 per kilogram** for miscategorized items to encourage proper waste segregation.
- **Data Integrity:** Maintaining a centralized audit trail of all verification activities and administrative actions.

3. Financial and Statistical Tracking

- **Payment Integration:** The scope includes a secure payment gateway (FPX) for users to settle outstanding penalty obligations.
- **System Analytics:** It generates real-time statistics, including total system-wide recycled weight, total number of requests, and pending task counts.

4. User Access and Hardware

- **Platform Accessibility:** The system is designed as a responsive web interface accessible via standard modern browsers on desktops, tablets, and smartphones.
- **Role-Based Control:** Access is strictly divided between **Regular Users** (community members) and **Administrators** (municipal staff)

1.4 Intended Users

The KiTARAN system serves two distinct user categories, each with specific roles and access privileges:

- Regular Users

Community members, households, or individuals who utilize the website to submit recycling requests for various materials. These users register personal accounts, create recycling requests specifying material categories (Plastic, Paper, Metal, or Glass), track their recycling history, monitor accumulated recycled weight, view outstanding penalties, and process penalty payments when necessary.

- Administrator Users

Municipal waste management staff members or environmental officers who possess administrative credentials to access the management portal. Administrators review all submitted requests, verify material authenticity during collection, record actual weights, apply penalties for miscategorized materials, monitor system-wide statistics, and maintain overall data integrity across the platform.

2.0 SYSTEM REQUIREMENT

To effectively utilize the KiTARAN system, users and administrators must ensure their computing environment meets the following specifications:

NO	FEATURE	DESCRIPTION
1	Hardware Requirements computing device capable of running modern web browsers	Desktop computer with minimum Intel Core i3 processor or equivalent
		Laptop computer with at least 2GB RAM
		Tablet device with 9-inch or larger display
		Smartphone with minimum 5-inch display <ul style="list-style-type: none">• Minimum screen resolution of 1024x768 pixels (system supports responsive design for mobile devices)• Active internet connection with recommended bandwidth of 2 Mbps or higher
2	Software Requirements A modern, updated web browser with JavaScript support:	Browser <ul style="list-style-type: none">• Google Chrome• Mozilla Firefox• Microsoft Edge• Safari
		Browser settings configured to: Accept cookies (required for session management)
		Enable JavaScript execution
		Allow pop-up windows for modal dialogs

3	Network Requirements	<p>Stable internet connectivity</p> <p>Firewall permissions for HTTP/HTTPS traffic</p> <p>Access to port 8080 (default application port)</p>
4	Additional Requirements for Administrators	<p>Valid administrator login credentials provided by system management</p> <p>Secure network connection recommended for handling user data</p> <p>Access to physical weighing equipment for material verification</p>
5	Server Requirements(For Deployment)	<p>Java Development Kit (JDK) 8 or higher</p> <p>Apache Derby Database Server running on port 1527</p> <p>Apache Tomcat 8.5+ or GlassFish Server 5.0+</p> <p>Operating System: Windows Server 2016+, Linux (Ubuntu 18.04+), or macOS 10.14+</p> <p>Minimum 4GB RAM and 50GB storage space</p> <p>Backup system for database recovery</p>

3.0 USER ROLES

The KiTARAN system implements a comprehensive role-based access control mechanism, clearly delineating responsibilities and privileges between two distinct user categories. This separation ensures data security, maintains operational efficiency, and provides each user group with interfaces and functionalities specifically designed for their needs.

3.1 Regular User

Regular users represent community members who access the system to participate in recycling activities. These users interact with the system through a public-facing interface designed for ease of use and clarity. The following functionalities are available to regular users:

NO	FEATURE	DESCRIPTION
1	Account Management	
	Register New Account	Create profile with username (min 3 chars), password (min 6 chars), phone number (10-15 digits)
	Secure Login	Authenticate using registered credentials
	Session Management	Maintain logged-in state with 30-minute timeout
	Logout	Maintain logged-in state with 30-minute timeout
2	Recycling Request	
	Create New Request	Submit request specifying material category, item description, pickup address
	Request Validation	System validates all required fields before submission

	Confirmation	Receive immediate confirmation of successful submission
	Initial Status	All new requests created with "pending" status
3	Dashboard Access	
	View Personal Statistics	Monitor Total Recycled Weight (kg) and Outstanding Penalty (RM)
	Access Recycling History	View complete list of all submitted requests with details
	Track Verification Progress	Monitor status for pending requests
4	Status Tracking	
	PENDING Status	Request submitted, awaiting administrator verification
	VERIFIED Status	Materials collected, correctly categorized, weight recorded
	PENALTY Status	Materials miscategorized, penalty applied at RM 0.50/kg
5	Payment Processing	
	View Penalty Obligations	Dashboard displays total outstanding penalty with "Pay Now" button
	Process Payments	Access FPX gateway, select bank, complete transaction
	Automatic Penalty Clearance	Upon successful payment, penalties reset to RM 0.00

	Transaction Confirmation	Receive unique transaction ID and payment details
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3.1 Administrator

Regular users represent community members who access the system to participate in recycling activities. These users interact with the system through a public-facing interface designed for ease of use and clarity. The following functionalities are available to regular users:

NO	FEATURE	DESCRIPTION
1	Secure Authentication	
	Administrative Login	Access using predefined credentials (admin/admin123)
	Role Verification	System confirms administrator status via is_admin flag
	Session Security	Maintain authenticated session with timeout controls
2	Dashboard Overview	
	System Total Weight	Aggregate weight of all verified recycling requests
	Total Requests	Complete count of all submissions in system
	Pending Requests	Number of unprocessed requests requiring attention
	Real-time Monitoring	All new requests created with "pending" status
3	Dashboard Access	
	View All Requests	Access comprehensive list of all recycling submissions

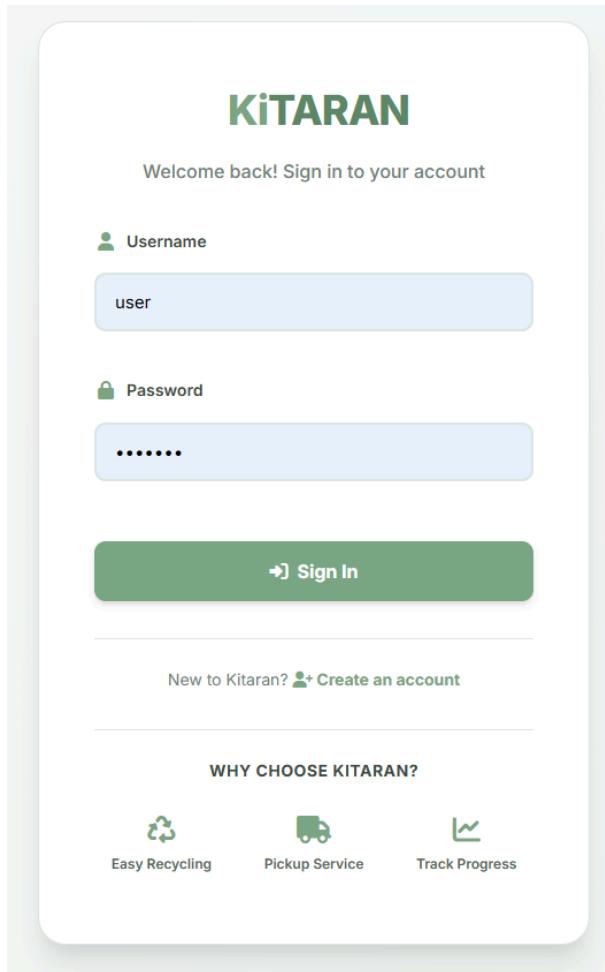
	Filter by Status	Apply filters: All, Pending, Verified, Penalty Issues
	Request Details	View complete information including user, material, address, weight, penalty
4	Request Verification	
	Review Pending Requests	Request submitted, awaiting administrator verification
	Enter Actual Weight	Identify requests requiring verification
	Confirm Verification	Update status to "VERIFIED" with recorded weight
	Update Statistics	Automatically increment user and system total weights
5	Penalty Application	
	Identify Miscategorization	Determine when materials don't match declared category
	Enter Miscategorized Weight	Input weight of incorrectly categorized materials
	Automatic Calculation	System applies RM 0.50 per kilogram (Formula: Weight × 0.50)
	Confirm Penalty	Update status to "PENALTY" and add to user's outstanding total
6	Data Integrity	
	Audit Trail	Record all actions with timestamps
	User Attribution	Track which administrator performed each action

	Prevent Duplicate Processing	Verified/penalty requests cannot be reprocessed
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4.0 USER MANUAL

4.1 User Login

1. Login Page



The Login Page is for authenticating the existing users into the system and loading personal information and records. It is important as it differentiates between normal user and administrator.

2. Register Page

The screenshot shows the KITARAN registration page. At the top center is the KITARAN logo in green. Below it is the tagline "Create your account to get started". The form consists of several input fields: "Username" (placeholder: Choose a unique username), "Password" (placeholder: Create a strong password), "Phone Number" (placeholder: e.g., 0123456789), and "Address" (placeholder: Your pickup address). At the bottom is a green button labeled "Create Account" with a user icon. Below the button is a link "Already have an account? [Sign in here](#)".

The Register Page is for new users to create their own credential to use the system. The user only needs to put their username, phone number and password.

4.2 Regular User

1. Home Page

The screenshot shows the KiTARAN Home Page. At the top left is the logo 'KiTARAN'. On the left sidebar, there are three buttons: 'Dashboard' (highlighted in green), 'New Request', and 'Logout'. The main content area starts with a welcome message 'Welcome back, user!' and a subtitle 'Here's your recycling activity overview'. Below this are two summary boxes: 'TOTAL RECYCLED WEIGHT' showing '2.9 KG' and 'OUTSTANDING PENALTY' showing 'RM 0.00'. A section titled 'My Recycling History' follows, featuring a table with one row of data:

# ID	TYPE	ITEM	WEIGHT	PENALTY	STATUS	ACTION
#1	Plastic	Bottle	2.9 kg	RM 1.5	PENDING	—

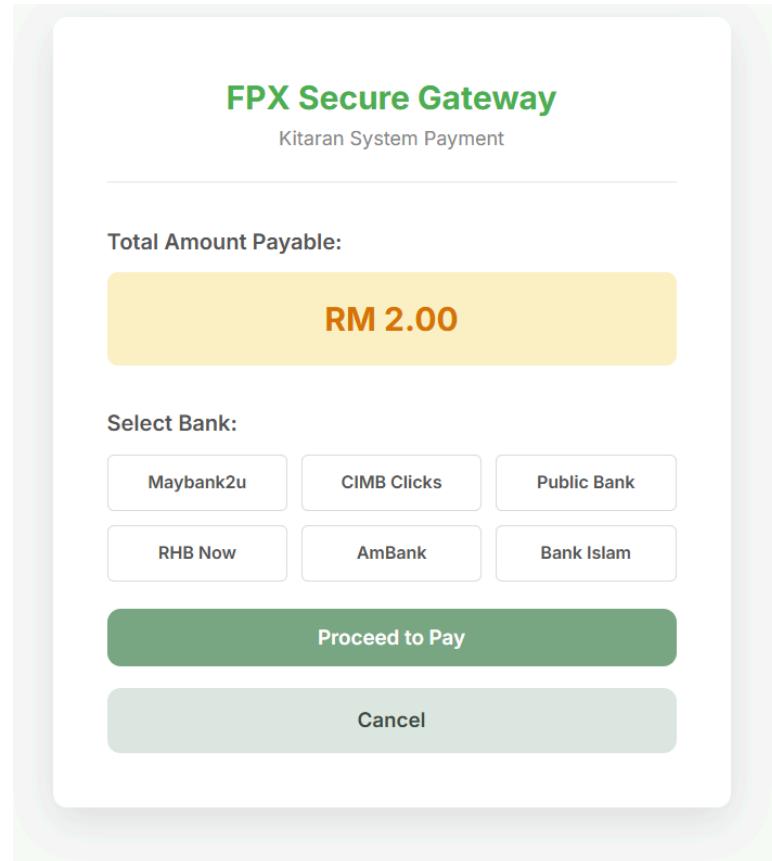
The Home Page is the first page users will see after successful login. It shows total weight, penalty cost and list of requests. Total weight is displayed to show how much the trash has been pickup using the system. Penalty is calculated if the user puts different types of trash beside what is written in the system and the heavier it is, the more it costs. This to help the pickup process and estimate the required labor for workers.

2. Request Page

The screenshot shows the 'Create New Request' page. At the top, it says 'Create New Request' and 'Welcome, user'. Below that, a note says 'Fill in details. The driver will weigh the items.' The page has three main input fields: 'Category' (a dropdown menu labeled 'Select Category'), 'Item Description' (a text input field with placeholder 'e.g. Cardboard boxes'), and 'Pickup Address' (a text input field with placeholder 'Pasir Tumbuh'). At the bottom right is a green 'Submit Request' button.

The Request Page is the place to gather information of user residence to schedule trash pickup. The user can enter their address and type of trash. The collected trash will be verified by the admin to determine the type of trash.

3. Penalty Payment Page



The user will be redirected to the payment page based on the penalty charged by administration. There will be a few options for payment such as Visa and e-banking.

4.3 Administrator

1. Home Page

The screenshot shows the Admin Command Center interface. On the left, there's a sidebar with 'KiTARAN' at the top, followed by 'Admin Panel' (highlighted in green) and 'Logout'. The main area has a title 'Admin Command Center' with a shield icon. Below it is a subtitle 'System management and oversight dashboard'. There are three summary cards: 'TOTAL WEIGHT' (8.90 kg), 'TOTAL REQUESTS' (2), and 'PENDING' (1). A section titled 'Recycling Requests' lists two entries:

# ID	CONTRIBUTOR	WEIGHT	PENALTY	STATUS	ACTION
#2	user UID: 1	6 kg	RM 2.00	PENDING	<button>✓ Verify</button>
#1	user UID: 1	2.9 kg	RM 1.50	VERIFIED	<button>✓ Completed</button>

The Home Page for admin is to verify the request sent by users and calculate the total weight. If there is a different type of trash included, the admin will set a penalty to the user for carelessness in organizing the trash. The penalty will be based on weight and type of trash.

5.0 CONCLUSION

The KiTARAN 3R Management System successfully digitizes the community recycling workflow, replacing traditional paper-based methods with a transparent and accountable web-based platform. By bridging the gap between community members and municipal waste management staff, the system fosters a more efficient and educational environment for environmental conservation.

Key achievements of the system include:

- **Operational Efficiency:** Automating request submissions, administrative tracking, and verification processes reduces manual overhead and streamlines waste management tasks.
- **Accountability and Accuracy:** The implementation of systematic verification, weight recording, and a penalty mechanism for miscategorization ensures data integrity and promotes proper waste segregation.
- **Financial Integration:** The inclusion of a secure payment gateway for penalty settlements provides a seamless experience for users to resolve outstanding obligations.
- **Data-Driven Insights:** Real-time monitoring of system-wide statistics, such as total recycled weight and request statuses, empowers the organization with valuable data for environmental impact reporting