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USER MANUAL – INTEGRATIVE PROJECT

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# Glossary

|  |  |
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| Address | Number of the house or apartment and the name of the street and the town where you live or work. |
| Agenda | Crucial mechanism for planning the week's work. |
| Attribute Core | Set of skills. |
| Backhoe | Machine used for digging and moving earth. |
| Bench | A long seat for several people, typically made of wood or stone. |
| Birth Date | The date on which a person was born. |
| Blower | A device that produces a current of air. It is designed to move air and gas at low to high pressure to perform a specific function. |
| Braille and Tactile Signage | Signage with raised lettering, Braille, and tactile symbols to provide information about park amenities, trails, and facilities for individuals with visual impairments. |
| Bricklayer | Person whose job is to build walls, houses, and other structures with bricks. |
| Brush Cutter | Machine used to cut grass and small bushes. |
| Budget Manager | Person who handle company finances as part of their role. |
| Bush | A shrub or clump of shrubs with stems of moderate length. |
| Chainsaw | A power tool that can quickly cut through tree trunks and branches. |
| Check-up | A thorough examination, especially a medical or dental one, or maintenance of a vehicle to detect any problems. |
| Cistern | A tank for storing water, especially one supplying taps or as part of a flushing toilet. |
| CLERK | Person responsible for carrying out various business supporting activities on the system. |
| Client | The client is the person who relates with the company. |
| CLK | Acronym for Clerk. |
| Collaborator | A person who is an employee of the organization and carries out design, construction and/or maintenance tasks for green areas, depending on their skills. |
| Composter | For composting organic waste materials such as kitchen scraps, yard trimmings, and plant debris to produce nutrient-rich compost for soil amendment. |
| Designer | A professional creating visual or functional solutions with a focus on aesthetics, user experience, and innovation. |
| Diary | Where you can keep a daily record of events and experiences. |
| Disc Harrow | A harrow with cutting edges consisting of a row of concave discs set at an oblique angle. |
| Drinking Fountains | A device, usually in a public place, that supplies water for drinking. |
| Ear Protection | Earplugs or earmuffs to reduce exposure to loud noise from equipment such as lawn mowers and leaf blowers. |
| Electrician | Person responsible for the maintenance of electrical installations in green spaces. |
| Email | A communication method that uses electronic devices to deliver messages across computer networks. |
| Employee | Person who carry out the most varied tasks in the context of designing and managing green spaces. |
| Equipment | General term referring to tools, machinery, or other devices used for a particular purpose or activity. |
| Fleet | Group of vehicle operated by an organization, such as a fleet of cars or trucks. |
| Fleet Manager | A person who manages the fleet park, the machines, equipment and vehicles, ensuring their good condition and assigning them to the tasks to be carried out. |
| FM | Acronym for Fleet Manager. |
| Fountain | An ornamental structure in a pool or lake from which one or more jets of water are pumped into the air. |
| Frequency of Vehicle Service | Interval of running kilometers between one overhaul and the next. |
| Garden | Garden space with or without trees with little or no equipment (may have a basic irrigation system or/and benches). |
| Gardener | Person who tends and cultivates a garden as a pastime or for a living. |
| Green Space | An area of grass, trees, or other vegetation set apart for recreational or aesthetic purposes in an otherwise urban environment. |
| Green Spaces Manager | The person responsible for managing the green spaces in charge of the organization. |
| Green Spaces User | A person who uses the green spaces managed by the organization and who can through the Portal, make comments or report faults in parks and gardens on the Portal. |
| GSM | Acronym for Green Spaces Manager. |
| GSU | Acronym for Green Spaces User. |
| HRM | Acronym for Human Resources Manager. |
| Hoe | Used for cultivating soil, removing weeds, and shaping planting beds. |
| Human Resources Manager | A person who manages human resources and defines teams based on the needs of ongoing projects and the skills of the employees. |
| Irrigation System | Refers to the artificial application of water to land or soil to assist in the growth of crops and vegetation. It is a crucial technique in agriculture, as it helps ensure that plants receive an adequate amount of water, particularly in areas where rainfall is insufficient or unreliable. |
| IE | Acronym for Information Expert |
| JaCoCo | A Java library that is responsible for instuementing the byte code while running tests. |
| Java | The programming language that is used to develop this application. |
| Javadoc | Documentation generator for Java language to generate API documentation in HTML format from Java source code. |
| JavaFX 11 | A set of graphics and media packages that enables developers to design, create, test, debug, and deploy rich client applications that operate consistently across diverse platforms. |
| Job | Jobs will be registered by HRM into the system. Some job examples are designer, estimator, gardener, electrician, or bricklayer. |
| JUnit | Java framework used for unit testing. Provides anotations and API's to simplify the process of writing and executing automated tests for Java code. |
| Ladder | A piece of equipment consisting of a series of bars or steps between two upright lengths of wood, metal, or rope, used for climbing up or down something. |
| Large-sized park | Multi-function space with diverse garden spaces, and woods, including varied equipment and services. |
| Lawnmower | Machine used to cut grass. |
| Leaf Blower | Helps to clear leaves, debris, and grass clippings from paths, lawns, and other surfaces, available in handheld, backpack, and walk-behind models. |
| Lifting Platform | A type of multi-functional machinery that is used for lifting and loading people or goods in a vertical form. |
| Lighting Systems | Illumination infrastructure within green spaces, enabling safe and enjoyable use during evening hours. |
| Machine | An apparatus used to carry out various types of jobs. |
| Medium-sized park | Green space with a few hundred or thousands of square meters with a wooded garden area. It includes some infrastructures such as toilets, drinking fountains, irrigation system, lighting, children’s playground. |
| Name | A word or set of words by which a person or thing is known, addressed, or referred to. |
| Organization | An organized group of people with a particular purpose, such as a business or a government department. |
| Outdoor Fitness Equipment | Pull-up bars, balance beams, or elliptical machines encourages physical activity and fitness. |
| Pipe | A tube used to convey water, gas, oil, or other fluid substances. |
| Playground | An outdoor area provided for children to play in, especially at a school or public park. |
| Pruning Saw | Designed for cutting larger branches and limbs of trees and shrubs, available in folding, curved, or straight blade designs. |
| Pruning Shears | Handheld tools for trimming and shaping shrubs, bushes, and small branches, available in bypass, anvil, and ratchet designs. |
| Rake | Used for gathering leaves, debris, and grass clippings, available in various types including leaf rakes, garden rakes, and thatch rakes. |
| RE | Requirements Engineering. |
| Safety Glasses | Shield eyes from flying debris, dust, and chemical splashes during pruning, mowing, and spraying activities. |
| Safety Helmet | Provides head protection from falling objects and overhead hazards when working under trees or performing tree care tasks. |
| SE | Software Engineering. |
| Seating Areas | Benches, picnic tables, and other seating arrangements offer places for visitors to rest and enjoy the surroundings. |
| Skill | The ability to do something well. |
| Skill set | A collection of abilities and competencies possessed by an individual. |
| Shovel | Used for digging, planting, and moving soil, available in various sizes and designs for different tasks. |
| Software Quality Assessment Team Manager | A person who manages the Software Quality Assessment Team and its process. |
| Soil Testing Kit | Enables analysis of soil pH, nutrient levels, and composition to determine fertility and identify any deficiencies or imbalances. |
| Sprayer | Machine used to spray liquids. |
| SSD | System Sequence Diagram. |
| Stream | A small, narrow river. |
| String Trimmer | An item ideal for trimming grass and weeds in areas where mowers cannot reach, such as around trees, fences, and edges. |
| Sun Protection | Hat, sunscreen, and lightweight clothing to protect skin from sunburn and UV radiation during outdoor work. |
| System | An interconnected set of components working together to perform specific functions or tasks. |
| Task | A work carried out by a team in one or more green spaces. |
| Team | Temporary associations of employees who will carry out a set of tasks in one or more green spaces. |
| To-do list | A list of things you have to-do. |
| Tool | A device or implement, especially one held in the hand, used to carry out a particular function. |
| Tractor | A powerful motor vehicle with large rear wheels, used chiefly on farms for hauling equipment and trailers. |
| Tree | A tall plant that can live a very long time. It has a single stem or trunk and branches that support leaves. |
| Tree Pruner | Tool that enables pruning of high branches without the need for a ladder, available in manual or powered models. |
| Truck | A large, heavy road vehicle used for carrying goods, materials, or troops. |
| UI | Acronym for User Interface. |
| US | Acronym for User Story(ies). |
| User | Person or entity interacting with a system, service, or platform. |
| User Portal | Portal where park and garden users can post comments, report faults or equipment malfunctions. |
| User Portal Comments | Feedback, observations, or opinions provided by users on the User Portal regarding their experiences, suggestions, or issues related to the services, facilities, or features offered. |
| Vehicle | A machine used by the team to carry out tasks and transport other machines and equipment. |
| Vehicle and Equipment Fleet Manager | Person who manages the fleet park, the machines, equipment and vehicles, ensuring their good condition and assigning them to the tasks to be carried out. |
| Vehicle Check-up | Maintenance of the Vehicle. |
| Vehicle type | Identifying the vehicle type, such as trucks, vans, heavy, or light. |
| VFM | Acronym for Vehicle and Equipment Fleet Manager. |
| Walking Path | Paths for walking, jogging, or cycling encourage physical activity and exploration of the space. |
| Waste Bin | Type of container intended to store waste. |
| Water Closet | A toilet, or a room containing a toilet. |
| Water Features | Streams or fountains not only enhance the beauty of the space but also provide habitats for aquatic plants and animals. |
| WC | Acronym for Water Closet. |
| Weeder | Used to remove weeds from a garden or field. |
| Wheelchair Accessible Pathways | Wide, smooth pathways with gradual slopes and no obstacles to accommodate wheelchair users and individuals with mobility aids. |
| Work Boots | Sturdy footwear with non-slip soles for traction and protection against sharp objects, uneven terrain, and chemical spills. |

# Introduction

This manual is designed to serve as a comprehensive guide for the efficient use of the GreenScape Management System, an innovative application tailored specifically for the administration and oversight of green spaces. Whether you are a park manager, a municipal green spaces administrator, or a member of an organization dedicated to the preservation and maintenance of natural landscapes, this manual provides essential insights and step-by-step instructions to maximize the utility of our application.

The scope of this document encompasses a detailed overview of the GreenScape Management System, highlighting its capability to revolutionize the way green spaces are managed. Users can expect to find information on:

* Inventory Management: Keep track of plants, equipment, and other resources.
* Maintenance Scheduling: Automate the planning of care and maintenance tasks.
* Visitor Management: Monitor and manage the flow of visitors to ensure an enjoyable and safe experience for everyone.
* Environmental Impact Assessments: Utilize built-in tools to evaluate and mitigate the environmental impact of green spaces.
* Stakeholder Engagement: Facilitate communication between management, staff, volunteers, and the community.

This manual is crafted with the needs of green spaces managers and administrators at its core, ensuring that the content is both relevant and directly applicable to the challenges and opportunities faced in the stewardship of natural areas. By leveraging the functionalities outlined in this guide, users will be able to enhance the ecological value, visitor satisfaction, and operational efficiency of their green spaces.

For any inquiries beyond the scope of this manual, we encourage you to reach out to our dedicated support team. Contact details are provided in the "Troubleshooting" section at the conclusion of this document.

# System Overview

The Green Spaces User Portal application aims to achieve several key objectives:

Multidisciplinary Team Management: Facilitates the organization and coordination of teams with diverse skills required for designing, constructing, and maintaining green spaces.

Allocation of Teams to Green Spaces: Provides functionality to assign teams to specific tasks in various green spaces based on their availability, required skills, and priorities.

Fleet, Machines, and Equipment Management: Manages the organization's fleet of vehicles, machines, and equipment, ensuring proper maintenance and efficient assignment to tasks.

Optimization of Irrigation and Lighting Systems: Supports the optimization of irrigation and lighting systems through data analysis and scheduling algorithms, aiming for efficient resource usage.

Production of Statistical Indicators: Generates statistical indicators to measure the performance of activities related to green space management, such as productivity metrics, resource utilization, and maintenance effectiveness.

Agile Development Using SCRUM: Follows an iterative and incremental development process, utilizing SCRUM methodology to manage teamwork in regular sprints.

Test-Driven Development (TDD): Adheres to the Test-Driven Development approach to ensure software maintainability.

The application is structured into several modules, including Multidisciplinary Team Management, Fleet and Equipment Management, Optimization of Irrigation and Lighting Systems, Production of Statistical Indicators, and Green Spaces User Portal. Each module performs specific functions to achieve the outlined objectives. Key modules also include User Interface, Feedback Management, User Authentication and Authorization, Database Integration, Notification and Alert, Administrative Dashboard, and API Integration. These modules collectively provide a comprehensive solution for effective communication, engagement, and management of public green spaces.

# Features

### 1. Esoft

### 1.1. Register a skill | HRM

As a Human Resources Manager (HRM), I want to register skills that a collaborator may have.

### 1.2. Register a job | HRM

As an HRM, I want to register a job that a collaborator need to have.

### 1.3. Register a collaborator | HRM

As an HRM, I want to register a collaborator with a job and fundamental characteristics.

### 1.4. Assign skills to a collaborator | HRM

As an HRM, I want to assign one or more skills to a collaborator.

### 1.5. Generate team proposal | HRM

As an HRM, I want to generate a team proposal automatically.

### 1.6. Register a vehicle | FM

As an FM, I wish to register a vehicle including Brand, Model, Type, Tare, Gross Weight, Current Km, Register Date, Acquisition Date, Maintenance/Check-up Frequency (in Kms).

### 1.7. Register a vehicle’s check-up | FM

As an FM, I want to register a vehicle’s check-up.

### 1.8. List the vehicles in need off check-up | FM

As an FM, I want to list the vehicles needing the check-up.

### 2. MATCP

### 2.1. US09 - Know the exact costs referring to water consumption of specific green space | GSM

This is a request for statistical analysis of water consumption costs in green parks, based on a provided CSV file. The objectives include creating a monthly bar plot of water consumption, calculating the average monthly water consumption costs for each park, and comparing statistical indicators between the park with the highest and lowest water consumption. This includes calculating the mean, median, standard deviation, and skewness coefficient, constructing relative and absolute frequency tables, checking for outliers, and graphically representing the data through histograms with 10 and 100 classes.

### 2.2. US10 - Know which piece(s) of equipment is/are used in each day | GSM

This is a request to analyze equipment usage data from a park, where users indicate the equipment they used each day. The provided CSV file contains the choices of 1000 users. The goal is to create a pie chart showing the percentage of usage for each piece of equipment, such as walking trails, picnic areas, and exercise gymnastics equipment.

### 2.3. US11 - Be able to collect data from the user portal about the use of the park

This is a request to analyze park usage data across different age groups. The data, stored in a CSV file, includes age (categorical), park recommendation (binary), and monthly visit frequency (numeric). The analysis involves calculating the proportion of users recommending the park within each age group and creating boxplots to visualize the distribution of monthly visit frequency by age group.

### 3. MDISC

### 3.1. US12 - Import a .csv file | GSM

Import a .csv file with water point coordinates (X, Y) and distances between them into a unified data structure, representing all possible routes for laying pipes, along with their installation costs.

### 3.2. US13 - Apply an algorithm that returns the routes to be opened and pipes needed to be laid with a minimum accumulated cost | GSM

Develop an algorithm to find optimal routes for laying pipes in a garden network, minimizing costs while ensuring adequate water supply. The output should include a .csv file with the output subgraph and total cost, along with visualizations of the input and output graphs. Additionally, provide documentation detailing the implemented procedures.

### 3.3. US14 - Run tests for inputs of variable size | QAM

Run tests on the US13 algorithm with inputs of varying sizes to observe its execution time behavior. Deliverables include a .csv file containing input size and execution time data for 30 examples, along with an image file showing the execution time graph for this data.