WASTE COLLECTION AND CLEANING MANAGEMENT SYSTEM

WACOMOS
Système de Gestion de la Collecte des Déchets

ALEXSYS
SOLUTIONS

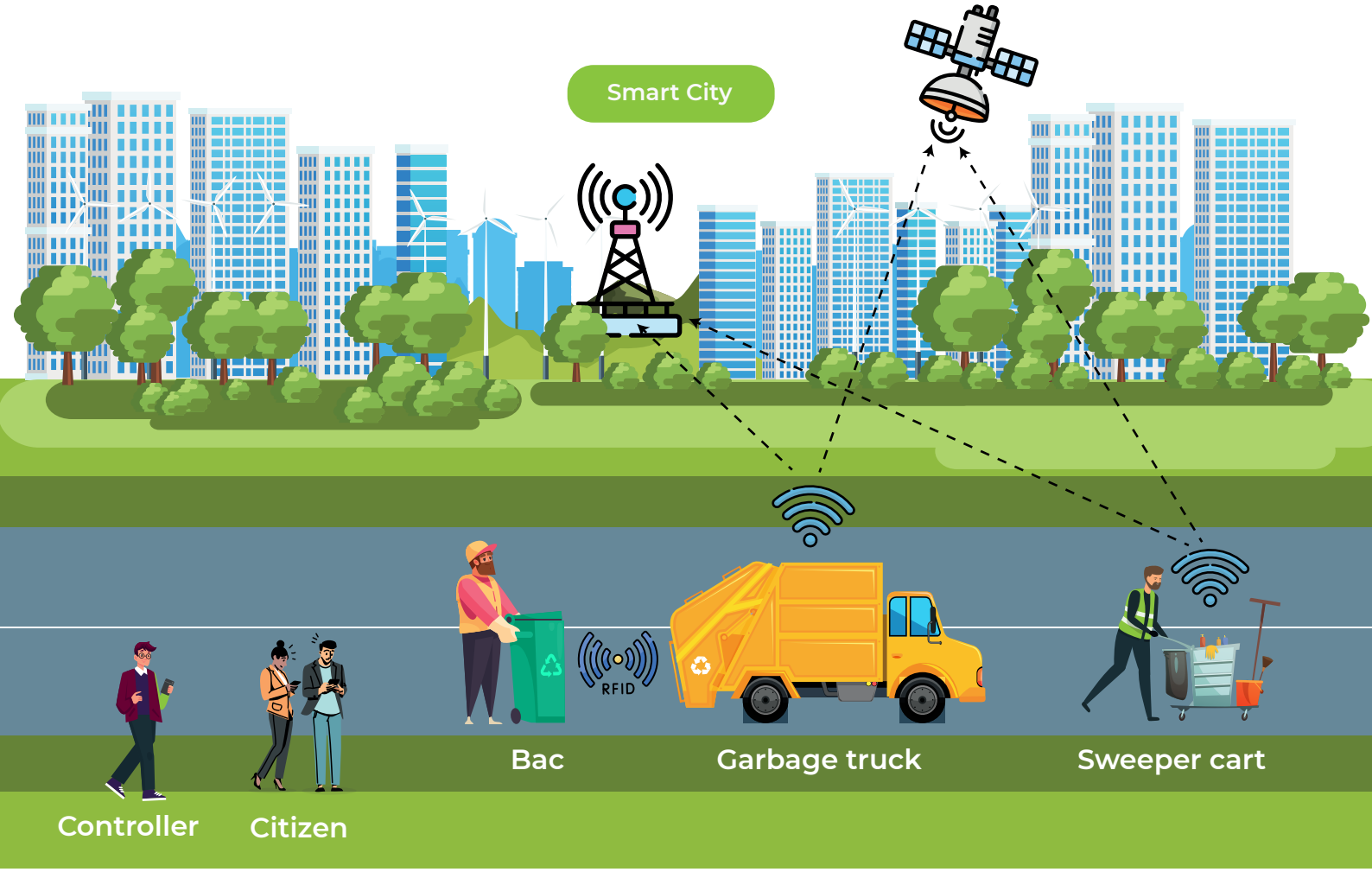
WACOMOS

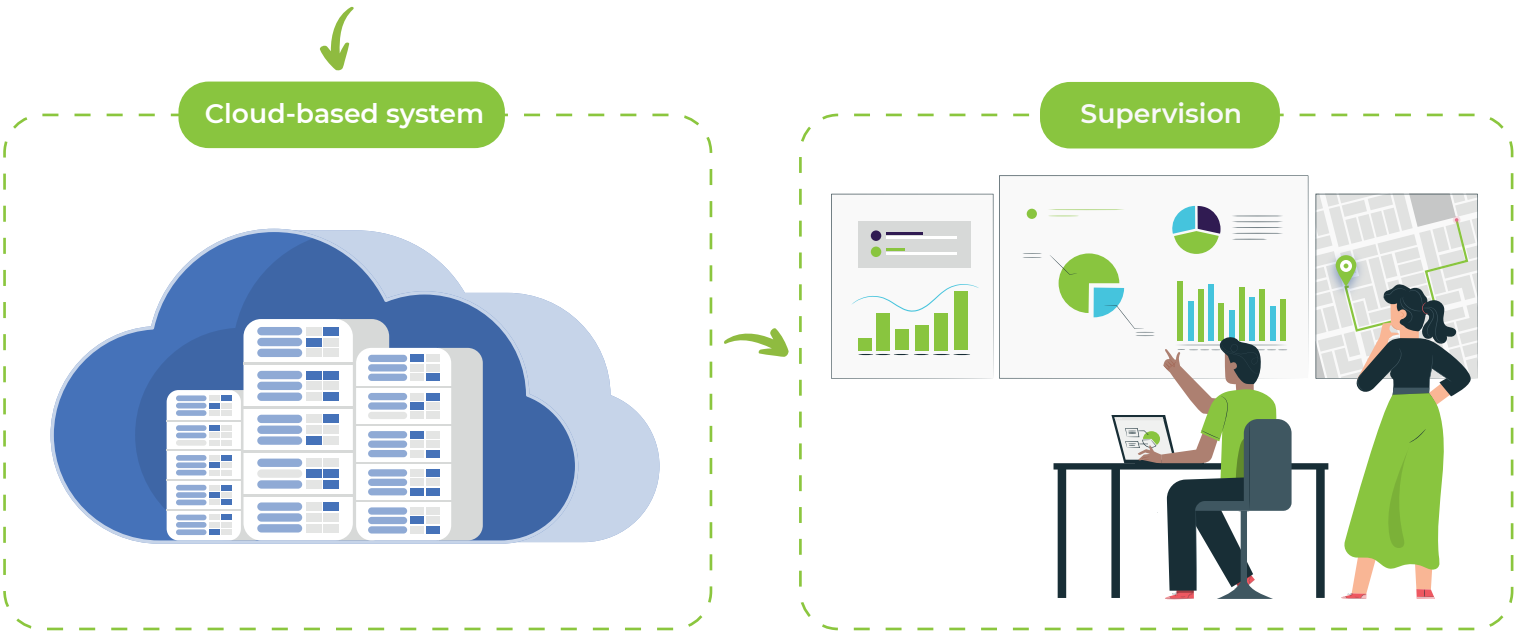
Digital Technology for The Environnement

WACOMOS : Waste Collection and Cleaning Management System

Population growth and rapid urbanization are leading to a considerable increase in waste production, making the traditional waste collection methods inefficient and costly.

WACOMOS is a solution to track and monitor waste collection and cleaning operations. It enables municipalities to understand the complex dynamics of their waste production, and to manage the public collection and cleaning service for household and similar waste. The solution provides real-time online access to data related to monitored waste skips, bins and vehicles. It combines intelligent sensors, a waste collection and cleaning management system, a mobile application for contractors, one for controllers, and another for citizens.





Functionalities and Modules

Our waste collection and cleaning monitoring system takes a holistic approach, addressing the diverse needs of the delegator, the delegatees and the citizens. Its comprehensive range of modules covers all the crucial aspects required for effective management of waste collection and cleaning in different areas.

Functional scope

The Back-office Module

At the heart of the system, the back-office module acts as a hub, streamlining the management of contractors, contracts, equipment, human resources and more. The use of electronic document management in our system WACOMOS offers an efficient solution for managing contracts and the necessary documents in a practical and secure way. Thanks to this functionality, contracts can be stored and accessed electronically, eliminating the need to manage bulky physical files.

1- Contractors management

2- Contracts management

3- Vehicles and engines management
- a. Types of vehicles and engines management
  - Collection vehicles
  - Containers washing vehicles
  - Mechanical sweeping vehicles
  - Other vehicles
- b. Main vehicles inventory management
- c. Vehicles maintenance management

4- Human resources management
- a. Recruitment management
  - Permanent recruitment
  - Seasonal recruitment
- b. Assignment management

5- Equipment management
- a. Equipment type management
  - Containers
  - Waste bins
  - Litter garbage cans
  - Plastic bags
  - Cleaning products
  - Sweeping products
  - Mechanical sweeping equipment
- b. Equipment management per type
  - Managing the supply of equipment
  - Equipment implantation management
    - Submission of the implantation plan
    - Validation of the implantation plan
  - Equipment location management
  - Equipment identification management

WACOMOS : A System that Integrates IoT and AI to Serve the Environment

We have integrated the use of IoT (Internet of Things) and AI (Artificial Intelligence) into our system WACOMOS, which has revolutionized waste collection and cleaning management by enabling real-time identification and tracking of containers, public litter garbage cans and vehicles along collection and cleaning routes. Thanks to the identification chips placed on these items, data can be collected and transmitted instantaneously, providing precise visibility of their location and status. This enables managers to monitor operations in real time, optimize vehicle routes and guarantee greater efficiency.

Moreover, the use of volume sensors integrated into the containers enables precise measurement of the fill rate. Once the predefined threshold is exceeded, teams are automatically alerted, enabling them to act quickly to empty containers and avoid overflow problems. This combination of IoT and volume sensors significantly improves waste management, enabling a proactive intervention and an optimal use of resources.

Operation Modules

In addition to the back-office module, the operation modules play an equally essential role. These modules provide a range of tools to optimize the planning and design of geographical routes for collection and cleaning vehicles.

These modules offer essential complementarity for optimal planning of collection and cleaning routes, schedules and frequencies. Thanks to the intelligence built into the system, more effective planning suggestions can be generated based on historical data collected from various sources such as IoT, complaints and feedback from controllers and citizens. This approach allows the system to learn from its environment, enabling it to provide the best recommendations in terms of scheduling and planning collection and cleaning operations.

The functionalities of these modules include, but are not limited to, the following :

1- Zones management

- a. Management of collection and cleaning zones
  - Squares, Souqs, Cemeteries, Public parks, Residential areas, others
- b. Management of collection and cleaning points

2- Routes management

- a. Collection routes management
  - Management of household and similar waste collection routes
  - Management of green waste collection routes
  - Management of rubble and inert waste collection routes
  - Management of bulky waste collection routes
  - Management of waste collection routes for black spots and dumping
- b. Cleaning routes management
  - Management of washing and brushing routes of containers and their locations
  - Caissons cleaning routes management
- c. Submission of the routes in an electronic format
- d. Validation of the routes
- e. Management of the control routes

3- Schedule management

- a. Waste collection schedule management
- b. Waste collection frequency management
- c. Cleaning schedule management
- d. Cleaning frequency management
- e. Control schedule management
- f. Control frequency management

4- Waste collection management and monitoring

- a. Waste types management
  - Household and similar waste
  - Green waste
  - Gravel and inert waste
  - Bulky goods
  - Waste from black spots and dumping
- b. Assignment of human resources management
- c. Equipment allocation management
- d. Vehicles allocation management

5- Non-conformities and penalties management

- a. Types of non-conformities management
- b. Management of the response time by type of non-conformity
- c. Management of the penalties by type of non-conformity

6- Management and monitoring of claims

- a. Management of controller claims
- b. Management of citizens claims

7- Notifications management

- a. Management of notification means (sms, email, etc)
- b. Management of notifications frequency

Mobile applications

Our system is supported by three separate mobile applications: one for contractors, another for the controller and a third for the public-citizens. These mobile applications offer a host of advantages in terms of real-time monitoring of operations, accessible any time anywhere.

1- Mobile application for contractors

For contractors, the mobile app enables them to supervise collection and cleaning activities in real time, using geolocation of motorized vehicles and carts, to manage human resources and vehicles, and to access key data and reports. This ease of real-time access enables the company to make informed decisions and optimize the efficiency of its operations.

2- Mobile application for controllers

For controllers, the mobile app gives them visibility of their routes and control schedules. They can monitor progress in real time, report problems or non-conformities, and take photos and videos via the app. This improves service quality, reduces delays and ensures compliance with quality standards.

3- Mobile application for citizens

Citizens can use the mobile app to report problems, make special requests or provide feedback on the cleanliness of their environment. They can also receive notifications of collection schedules, route changes or awareness-raising initiatives. This encourages citizen involvement and helps create a cleaner and a more pleasant environment for all.

Dashboard and statistics

Data plays a crucial role in decision-making and service improvement. In our system, we have integrated a powerful dashboard that gives the delegator and contractor an overview of the management of waste collection and cleaning operations at a glance. The dashboard can be customized to meet the specific needs and data analysis objectives of the delegator or contractor.

With this dashboard, users have access to in-depth analyses that provide key information on operational performance, trends, quality indicators and much more. Data is presented clearly and visually, making it easy to understand and interpret key information.

The dashboard includes, but is not limited to, the following elements :

1. Real-time display of vehicles on the map
2. Real-time display of container fill rate
3. Real-time data on waste collection progress
4. Real-time data on cleaning progress
5. Statistics on complaints received from citizens (by zone, type, etc.)
6. Statistics on complaints received from the controller (by zone, type, etc.)
7. Statistics on the contractor's intervention rate
8. Statistics on the collected waste tonnage

The Benefits of our Waste Collection and Cleaning Management and Monitoring System

Our waste collection and cleaning management and tracking system WACOMOS offers many important advantages. Here are some of the key benefits :

1- Operational Efficiency

WACOMOS enables optimized planning of collection and cleaning routes, schedules and frequencies. This maximizes resource utilization, optimizes routes, reduces intervention times and minimizes operating costs.

2- Service Quality Improvement

By monitoring operations in real time, the system ensures that collections and clean-ups are carried out to the required standards. Controllers can detect problems quickly, take corrective action and guarantee high-quality service to citizens.

3- Efficient Resource Management

Thanks to the use of IoT and mobile apps, the system enables real-time monitoring of vehicles, containers, litter garbage cans, routes and cleaning operations. This provides instant visibility of ongoing activities, enabling rapid response to problems and optimized performance.

4- Real-time Monitoring

Grâce à l'utilisation de l'IoT et des applications mobiles, le système permet un suivi en temps réel des véhicules, des conteneurs, des corbeilles publiques, des circuits et des opérations de nettoiement. Cela offre une visibilité instantanée sur les activités en cours, permet de réagir rapidement aux problèmes et d'optimiser les performances.

5- Smart Management of waste

Wacomos integrates volume sensors to measure the containers fill rates. This enables collection routes to be optimized by focusing on containers requiring immediate attention, thus reducing collection costs and minimizing unnecessary trips.

6- Civic involvement

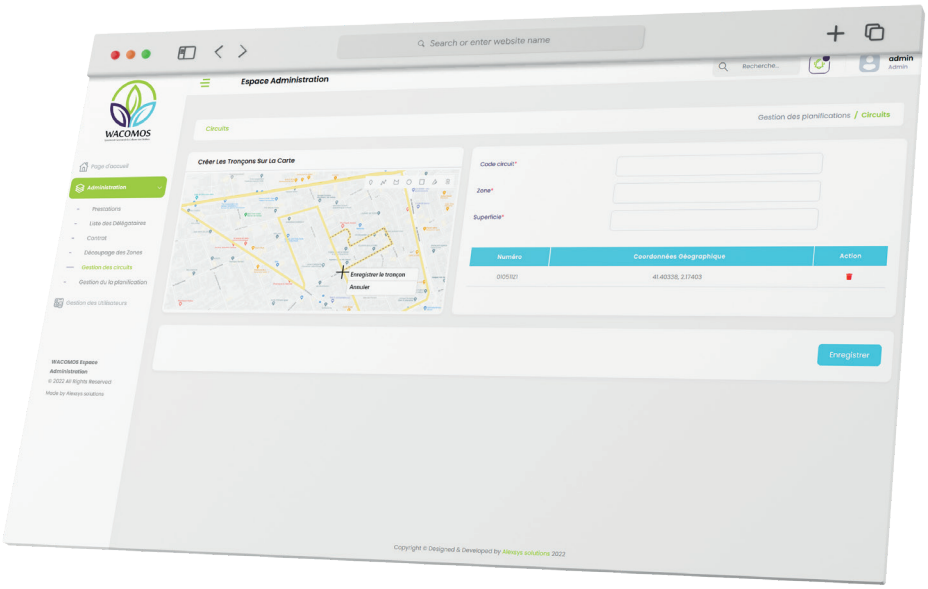
Wacomos offers interactive functionalities for citizens. The mobile app allows them to report problems, make special requests or provide feedback. This encourages citizen involvement in waste management and promotes effective collaboration between the municipality and the community.

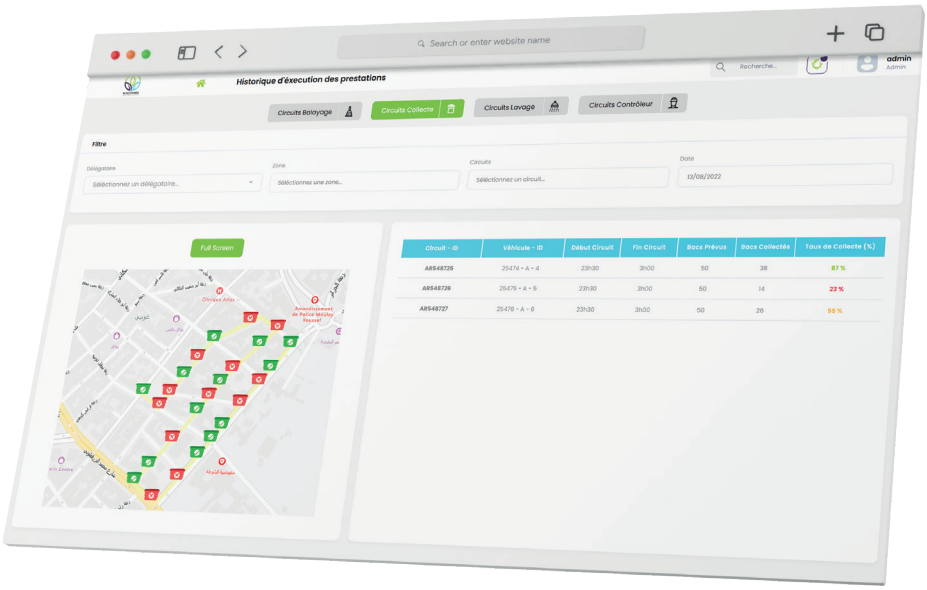
7- Data-driven Decision-making

Our system collects and analyzes a large amount of data. This provides valuable information to make informed decisions, identify trends, detect recurring problems and continuously improve processes and services.

In summary, WACOMOS, our waste collection and cleaning management and tracking system, offers considerable benefits in terms of operational efficiency, service quality, resource management, real-time tracking, intelligent waste management, civic engagement and data-driven decision-making. It helps create a cleaner, more sustainable and satisfying environments for all.

Main Control Application Interfaces





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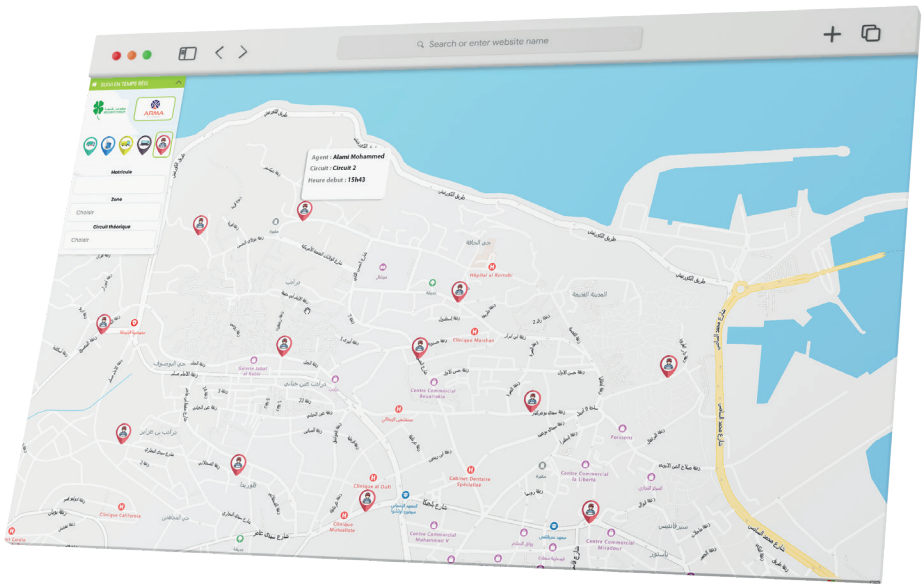
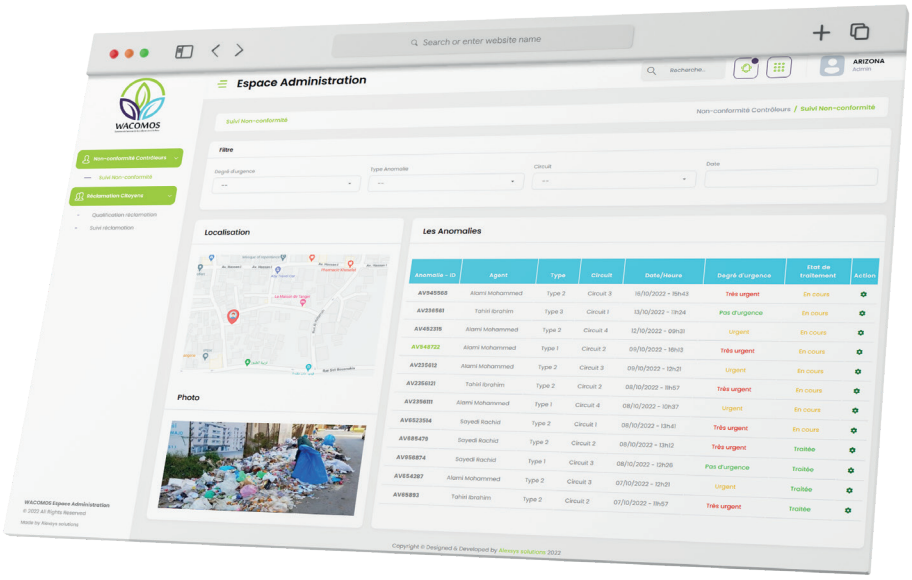
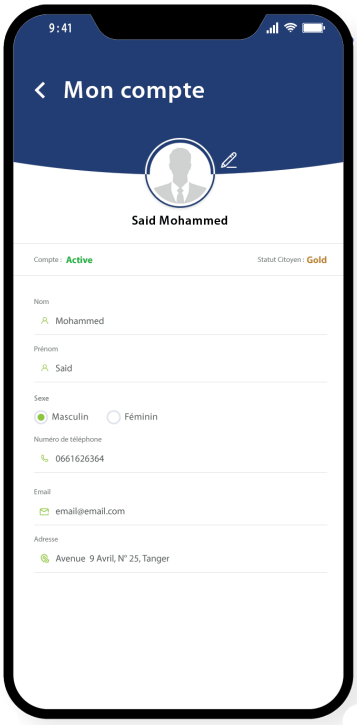
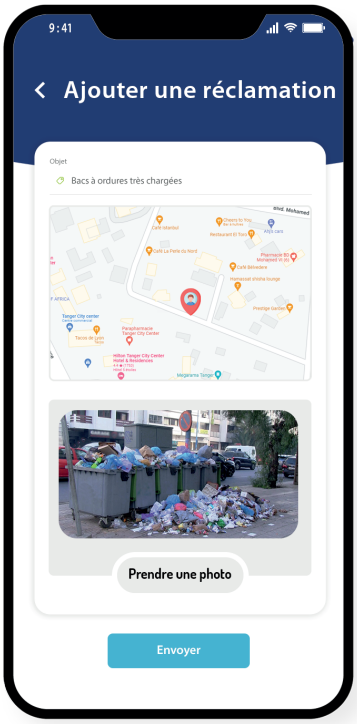
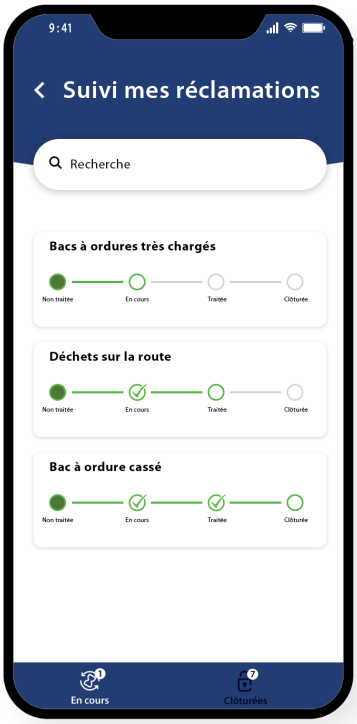




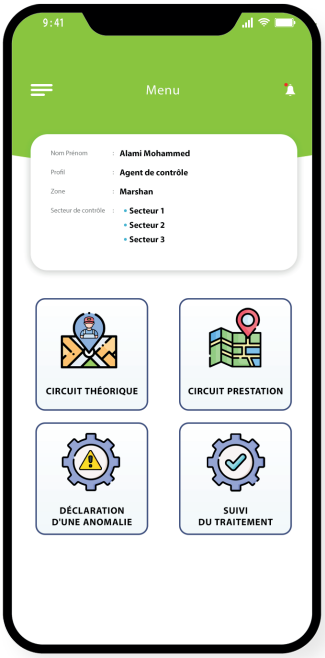
Interfaces of the Citizen Complaints Management Mobile Application

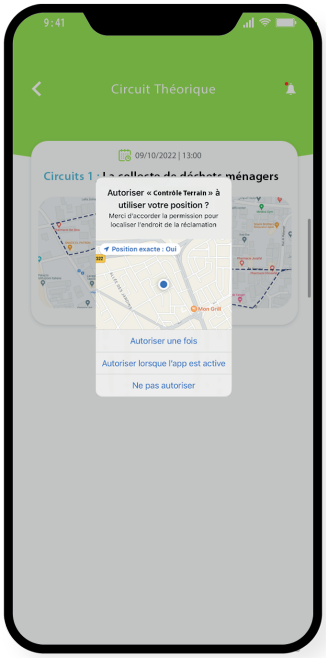


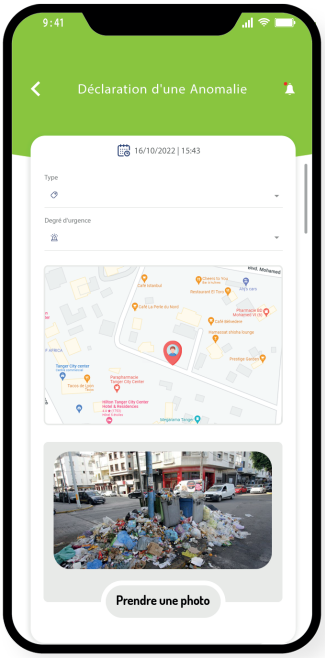


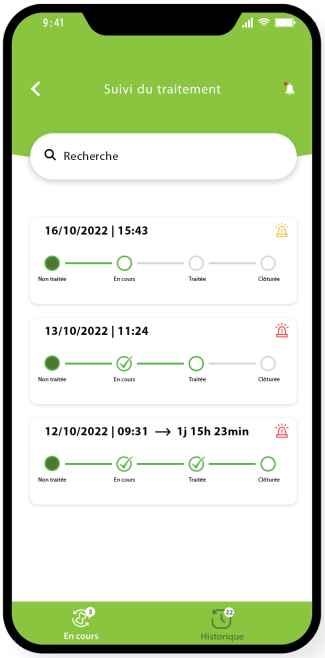


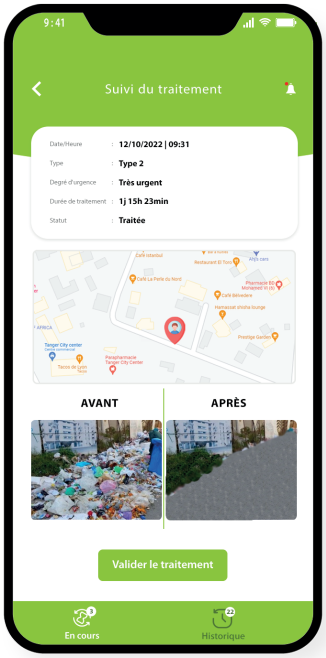
Field Control Mobile Application Interfaces











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Alexsys Solutions

Casablanca
N° 37, Allée des Eucalyptus Ain sebâa
Casablanca, Maroc
(+212) 5 22 66 34 81

Rabat
131, Avenue Allal Ben Abdellah Bureau N° 2,
1er étage Hassan, Rabat.
(+212) 5 37 26 21 05

Paris
191-195 avenue Charles De Gaulle 92200
Neuilly-sur-seine France
(+33) 1 73 09 42 30

For more details, please visit our website
www.Alexsys.Solutions