

# **FILOZOF MOBILE ANALYSIS AND INFORMATION SYSTEM**

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## **1. CONCEPT AND SCOPE**

The design and implementation objectives of the system are:

- Integrating with mobile data infrastructures such as Wialon to receive, store, and report data from these infrastructures.
- Obtaining concise yet effective results for fleets and managers through analysis of the acquired data.
- Providing instant notifications.
- Transferring results to other systems within B2B and B2C scope.

Subject to revision tracking.

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## **2. SYSTEM FEATURES**

### **2.1. Login Module**

#### **Header**

- Filozof Mobil Technologies and logo
  - SRS (Smart Reporting System)
  - Language selection and flag
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### **2.2. Reporting Module**

#### **2.2.1. Common Interface Components and Functions**

The common fields and functions used in all report types in the reporting screen are as follows:

**Report Type Selection:**

The user selects the desired report type from a drop-down list (combobox) including the options *Mileage Report* and *Fuel Consumption Report*.

**Group Selection:**

The vehicle group for which the report will be generated is selected here. Options are listed based on up-to-date data retrieved from Wialon. This group list is automatically updated in the background every evening at 9:00 PM, ensuring that reports always operate with the most current group structure.

**Date Range Selection:**

If the user accidentally selects a start date later than the end date, the system displays the warning: *"The start date cannot be later than the end date."*

**Run Report Button:**

Once the necessary selections (group and date) are made, clicking this button triggers the reporting process. The system retrieves the relevant data from the database based on the specified criteria and lists the results on the interface shortly thereafter.

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### 2.2.2. Mileage Report

This report shows the distance traveled and related details of the vehicles in the selected group within the specified date range.

**Report Results Screen:**

- **Header:** Above the results table, a header indicates the total number of vehicles included in the report (e.g., "Report Results (25 Vehicles)").
- **Pagination:** The user can select the number of rows displayed per page (10, 20, 50, 100). The total number of pages is dynamically calculated according to this selection, and the user can navigate between pages.
- **Export to Excel:** The *Download Excel* button downloads the entire displayed report in .csv format to the user's computer. A notification message is displayed once the download is completed successfully.

## Report Columns:

Column Name	Description	Data Source / Calculation
Plate	The registered license plate number of the vehicle.	Database
Start Km	The odometer reading of the vehicle at the beginning of the selected date range.	Database
End Km	The odometer reading of the vehicle at the end of the selected date range.	Database
Distance Travelled	End Km – Start Km difference.	Calculated in the background in real time.
Date/Time	Exact date and time when the End Km value was recorded.	Database
Status	Current status of the vehicle in the system (Active, Deactivated, Deleted).	Database

## Data and Display Logic:

- **Background Data Collection:** A background service retrieves vehicle telemetry data from Wialon every 6 hours and records it into the database.
  - **Distinction Between "0 Km" and "No Data":**
    - If the vehicle has not moved at all during the relevant date range (Start Km = End Km), the *Distance Travelled* column displays a blue "0".
    - If no telemetry data exists for the relevant date range, the kilometer columns display "No Data".
  - **Status Column Logic:**
    - *Active Vehicle:*
      - If Data Exists: All columns are filled normally. Status shown as "Active".
      - If No Data: Km columns display "No Data". Status shown as "Active".
    - *Deactivated Vehicle:*
      - If Data Exists: All columns are filled normally. Status shown as "Deactivated".
      - If No Data: Km and Date columns are left blank or display "No Data". Status shown as "Deactivated".
    - *Deleted Vehicle:*
      - If Data Exists: All columns are filled normally. Status shown as "Deleted".
      - If No Data: Km and Date columns are left blank or display "No Data". Status shown as "Deleted".
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### 2.2.3. Fuel Consumption Report

This report analyzes the fuel consumption amounts and efficiency rates of vehicles in the selected group within the specified date range.

## Report Results Screen:

The interface functions (header, pagination, export to Excel) are identical to those of the Mileage Report.

## Report Columns:

Column Name	Description	Data Source / Calculation
Plate	The registered license plate number of the vehicle.	Database
Start Time	Start date of the report range.	Database
End Time	End date of the report range.	Database
Distance Travelled	Total distance covered by the vehicle.	Calculated using the same function as in the Mileage Report.
Fuel Consumption Amount	Total fuel consumed by the vehicle (Liters).	Database (sum of data within the selected date range).
Fuel Consumption Rate	Average fuel consumed per 100 km (L/100km).	Calculated in real time as $(Fuel\ Consumption\ Amount / Distance\ Travelled) * 100$ .
Status	Current status of the vehicle in the system.	Same logic and color coding as Mileage Report.

## Data and Display Logic:

- **Background Data Collection:** A service running daily at 01:00 retrieves the previous day's fuel data (00:00:00 – 23:59:59) from Wialon and stores it in the database.
- **Data Consistency:** The *Distance Travelled* value is calculated using the exact same function as in the Mileage Report, ensuring no inconsistencies between the two reports.
- **Status Logic:** The display and color coding logic for the Status column is identical to the Mileage Report.

## 2.3. Analysis Module

### 2.3.1. Filtering and Control Elements

The filtering fields in the analysis screen (group selection, date range, etc.) are identical to those in the reporting screen, ensuring user familiarity.

#### Group Selection and Date Range:

The user specifies the vehicle group and time range to be analyzed using the *Group Selection* and *Date Range Selection* components defined in the Reporting Module (see Section 2.2.1). The functionality and data sources of these components are exactly the same.

#### Control Buttons:

- **Generate Analysis:** After selecting filtering criteria, clicking this button triggers the analysis process. The system retrieves and processes the relevant data, displaying the results in the interface.
- **Download Excel:**
  - Initially, this button is disabled (unclickable).
  - It becomes active only after the "Generate Analysis" button is clicked and the analysis results are successfully loaded on screen.

- If the user navigates between modules or refreshes the page, the button becomes disabled again for security and data consistency.

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### 2.3.2. Brand-Type-Model Analysis (Main View)

When the *Generate Analysis* button is clicked, the vehicles in the selected group are grouped by brand and model, and presented in a summary table.

**Header:** Above the results table, a header summarizing the scope of the analysis is displayed (e.g., "Brand-Model Analysis: 8 Brand-Models, 34 Vehicles").

#### Analysis Columns:

Column Name	Description	Data Source / Calculation
Brand-Model	Rows grouped by brand and model information of vehicles.	Database
Vehicle Count	Total number of vehicles belonging to the relevant brand-model.	Database
Average Consumption	Average fuel consumption rate (L/100km) of vehicles in the relevant brand-model.	Calculated using the function from the Fuel Consumption Report.
Minimum	Lowest fuel consumption rate among vehicles in this brand-model.	Database
Maximum	Highest fuel consumption rate among vehicles in this brand-model.	Database
Detail	Clicking this row opens/closes the detailed table listing vehicles belonging to that brand-model.	Interface Interaction

### Settings Module

#### General:

This section is created to verify the accuracy and validity of the data obtained from the system and the calculated information. Specifically, values such as kilometers traveled in a unit time and amount of fuel consumed are checked before calculation to eliminate the effect of general irregularities.

#### Analysis Settings:

#### Vehicle Categories:

- Bus
- Truck / Lorry
- Passenger Car
- Midibus / Minibus
- Light Commercial Vehicle

### Km Evaluation Parameters:

- Minimum Kilometer: Default is set to "0".
- Maximum Kilometer: Defined by the user. Default is 30,000 km.

### Fuel Consumption Parameters:

- Minimum Fuel Consumption Rate (average fuel consumption – L/100 km): This value must be entered based on vehicle category. Prepared as a table. The user inputs this value. "0" is not allowed.
  - Maximum Fuel Consumption Rate: Defined by the user.
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## 3. DESIGN DETAILS

### 3.1. Detail View

When a *Detail* button in the main analysis table is clicked, a sub-table opens containing individual performance data of vehicles belonging to the relevant brand-model.

#### Detail Table Columns:

Column Name	Description	Data Source / Calculation
Plate	Registered license plate number of the vehicle.	Mileage/Fuel Report functions
Distance Travelled	Total distance covered by the vehicle within the selected date range.	Mileage Report function
Consumption Rate	Average fuel consumption per 100 km of the vehicle.	Fuel Consumption Report function
Total Consumption	Total fuel consumed by the vehicle (Liters).	Fuel Consumption Report function
Start	Start date of the report range.	Database
End	End date of the report range.	Database
Status	Current status of the vehicle in the system.	Database

#### Data Consistency Principle:

All data in this module (Distance Travelled, Consumption Rate, etc.) is retrieved from the existing functions used in the Mileage Report and Fuel Consumption Report modules to completely eliminate inconsistencies. This ensures that no different results are displayed for the same vehicle on different screens.

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### 3.2. Data Transfer and Synchronization

**Export to Excel:**

When activated, the *Download Excel* button downloads the main analysis table and all expanded detail tables currently displayed on screen as a single .xlsx file.

**Background Data Synchronization:**

Vehicle information and telemetry data required by the analysis module are updated daily at 19:00 via a background service using the Wialon API and transferred to the database.