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ALGEBRA

<WATMS >

Functionality specification

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Version history

Version	Date	Author	Comment

Document certification

Name	Role	Company	Date	Signature

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Content

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Introduction

WATMS is an integrated information system designed to support wildlife monitoring, research and reserve management. It combines a web application, a mobile application and IoT devices to collect, store and analyze data about animal movements, health and habitat conditions.

Scope of the project

+ what will be implemented:

- Web application for administrators
- Mobile application for researchers
- Data collection, visualization and reporting

+ what is **not the part of the project**

- Manufacturing of IoT devices
- Physical installation of fences or collars
- Satellite infrastructure

Concepts

WATMS – the overall system
IoT Device – GPS collars and sensors attached to animals
Observation – record of animal sighting or behavior
Heatmap – visual map of animal movement
Offline mode – ability to store data without internet

Role description

Field Researcher- Collects animal observations, photos, videos
Reservation Worker - aintains IoT devices, patrols, reports threats
Administrator- Manages users, analyzes data, creates reports
System- Central server and database

Assumptions and dependencies

It is assumed that users have smartphones or tablets with the mobile application installed. IoT devices must be able to send data to the central server. Internet connection may not always be available, so offline mode is required. The system depends on a central server and external map services for data visualization.

List of requirements

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Requirements related to functionality

<User authentication and access control >

The system shall allow users to log in and provide different access rights for administrators, researchers and reservation workers.

<Animal observation recording >

The mobile application shall allow users to record animal sightings, behaviors and health conditions.

<Photo and video upload >

Users shall be able to upload geotagged photos and videos to support their observations.

<GPS tracking >

The system shall receive and store GPS data from IoT devices attached to animals.

<Alerts and monitoring >

The system shall generate alerts when unusual animal movements or restricted area violations are detected.

<Web dashboard and heatmaps >

The web application shall display collected data using maps, heatmaps and charts.

<User and device management >

Administrators shall be able to manage users and IoT devices through the web application.

<Reports and analytics >

The system shall allow administrators to generate reports for research and wildlife management.

<Multilingual support >

The mobile application shall support English, French, Spanish and Swahili, while the web application shall support English and French.

Requirements related to characteristics

The system shall have a response time below 500 milliseconds. All communication between applications and IoT devices shall be encrypted. The system shall be reliable and available at all times. Data shall be stored securely and protected from unauthorized access.