UNIVERSITATEA TEHNICĂ A MOLDOVEI

# SOIL COMPOSITION CONTROL

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# Domain Analysis

21% of Moldova’s workforce is employed in agriculture

60.5% of Moldova's arable land area is affected by soil degradation

# Problem Definition

- Soil Degradation
- Inefficient fertilizer use
- Climate-induced fluctuations

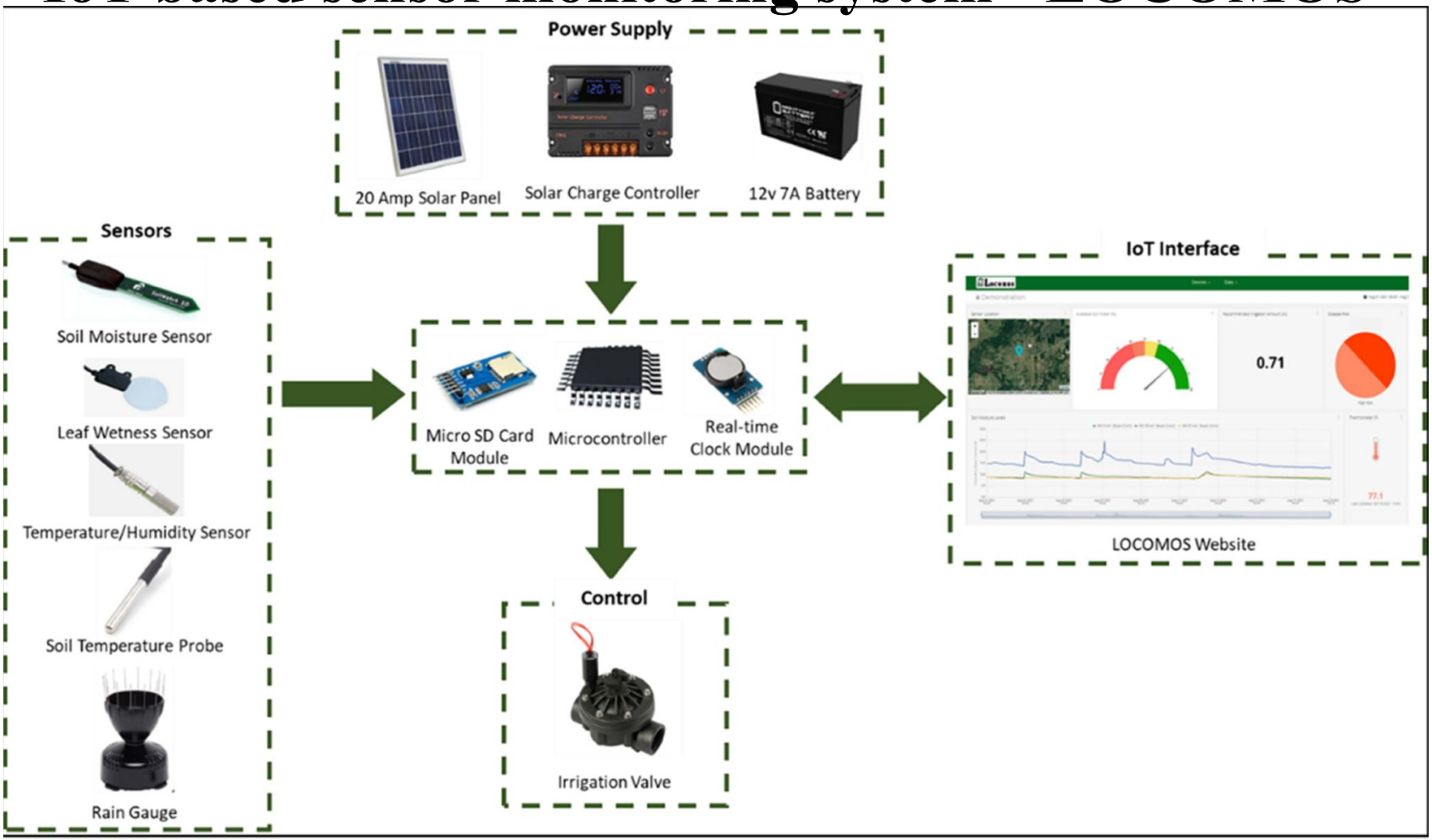
# Problem Definition

These issues combine to threaten agricultural productivity, national food security, and the long-term sustainability of farming in Moldova.

# SOLUTION

- Functional IoT soil monitoring system with integrated sensors
- Cloud-based data visualization dashboard
- Mobile/web application for user access
- Secure data storage and analytics module

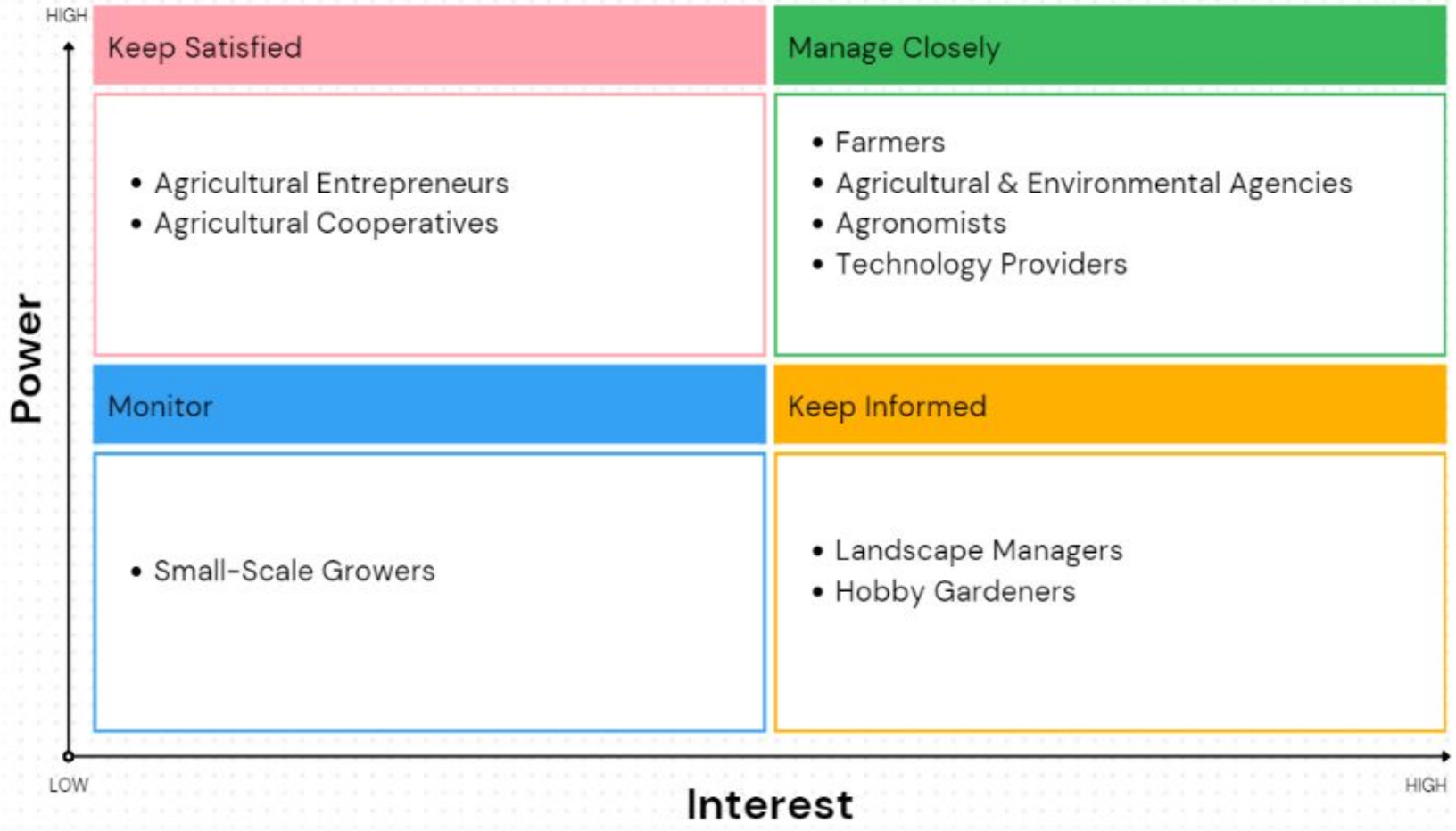
# IoT-based sensor monitoring system - LOCOMOS

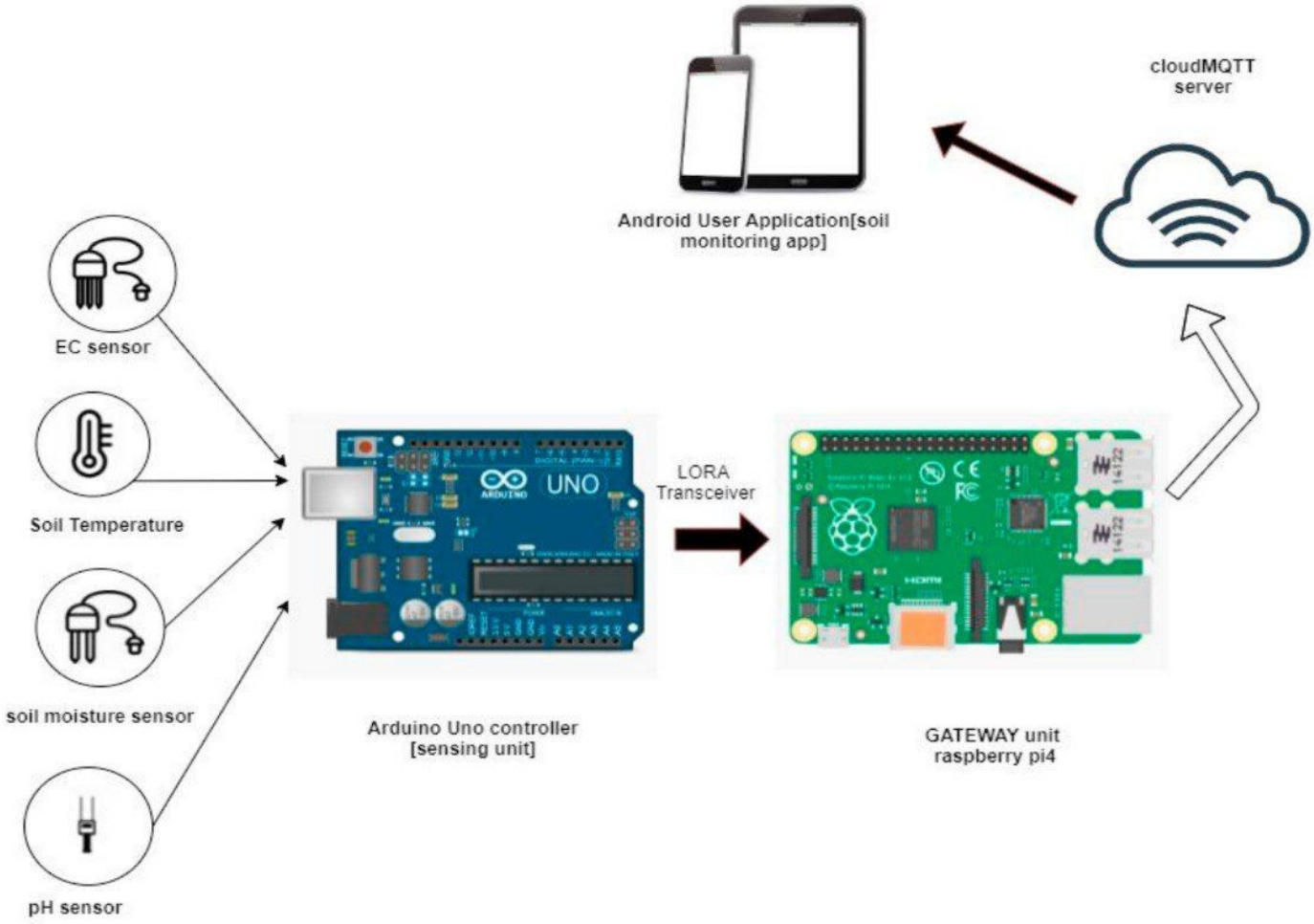


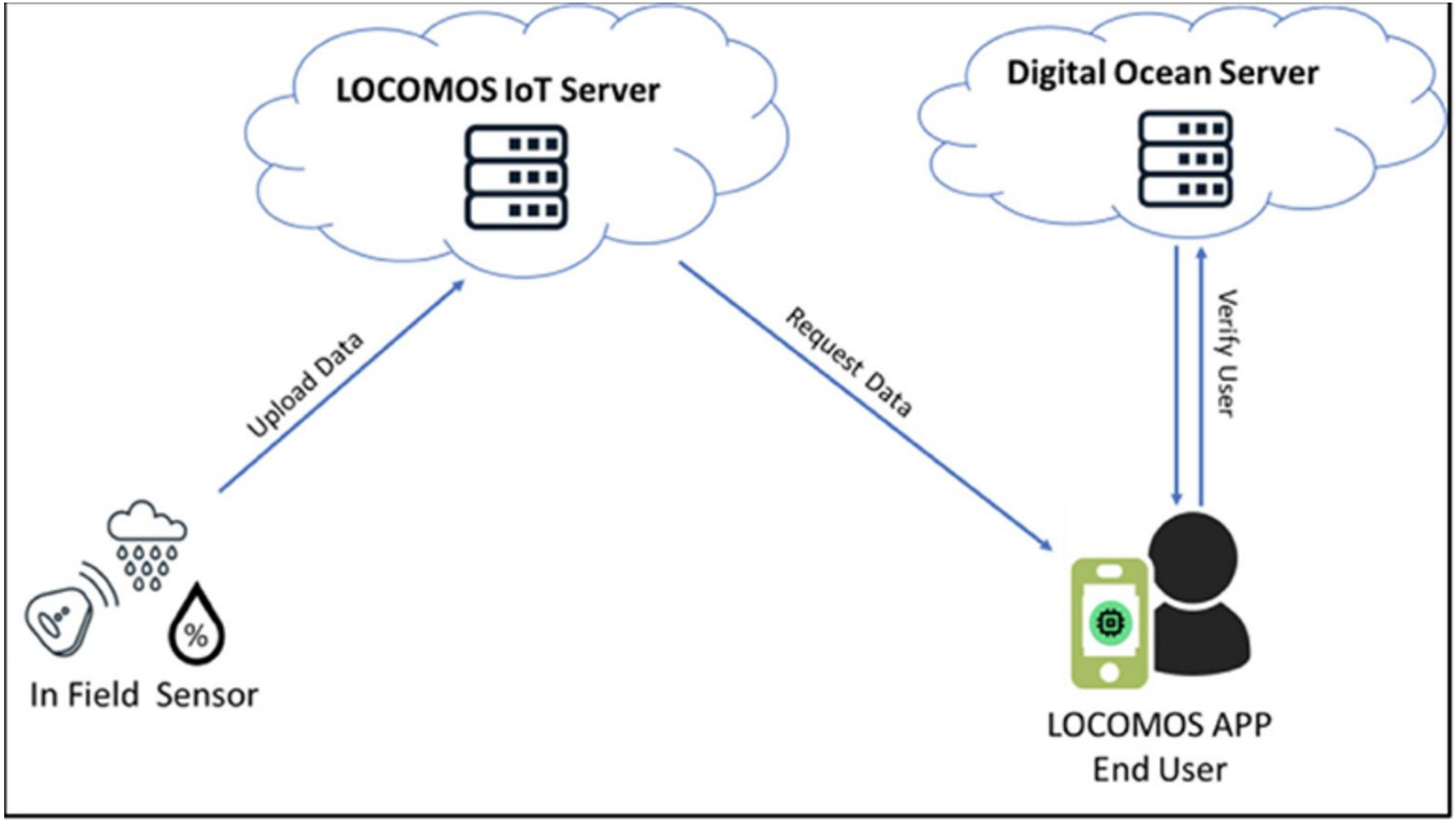
# Potential Stakeholders

- Farmers
- Agronomists
- Agricultural Entrepreneurs and Business Owners
- Hobby Gardeners and Small-Scale Growers
- Landscape Managers and Public Green Space Administrators
- Agricultural and Environmental Agencies in Moldova
- Technology Providers and IoT Solution Developers
- Agricultural Cooperatives and Associations

# Stakeholder Map Diagram




cloudMQTT
server
Android User Application[soil
monitoring app]
EC sensor
Soil Temperature
soil moisture sensor
pH sensor
UNO
LORA
Transceiver
Arduino Uno controller
[sensing unit]
GATEWAY unit
raspberry pi4

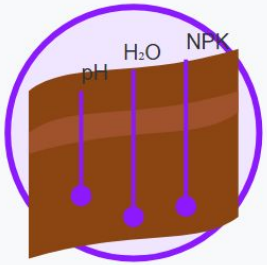

LOCOMOS IoT Server
Digital Ocean Server
Upload Data
Request Data
Verify User
In Field Sensor
LOCOMOS APP
End User

# Key Stakeholder Requirements

Affordability

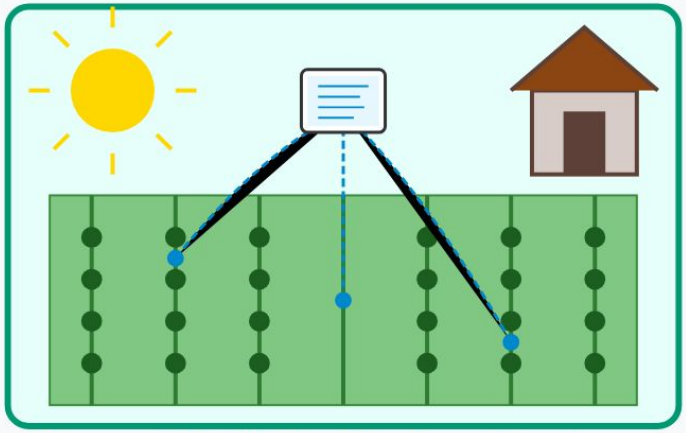
Ease of Use

Real-time Data




Soil Composition

Data Security



Smart Soil Monitoring System

# System Requirements

- 79 System Requirements
- grouped into 27 categories

## Key Areas:

Core Functionality
User Experience
System Performance and Reliability

# Architectural Decisions and Rationale

- Multi-Layered Architecture
- Edge-to-Cloud Data Processing
- Cross-Platform User Interfaces
- Secure Communication and Data Protection

# Conclusions

Our mission consists of helping the user analyze soil composition data, in order to make better decisions and be able to take better care of their crops.

**NEXT STEP:** to build a POC of our system