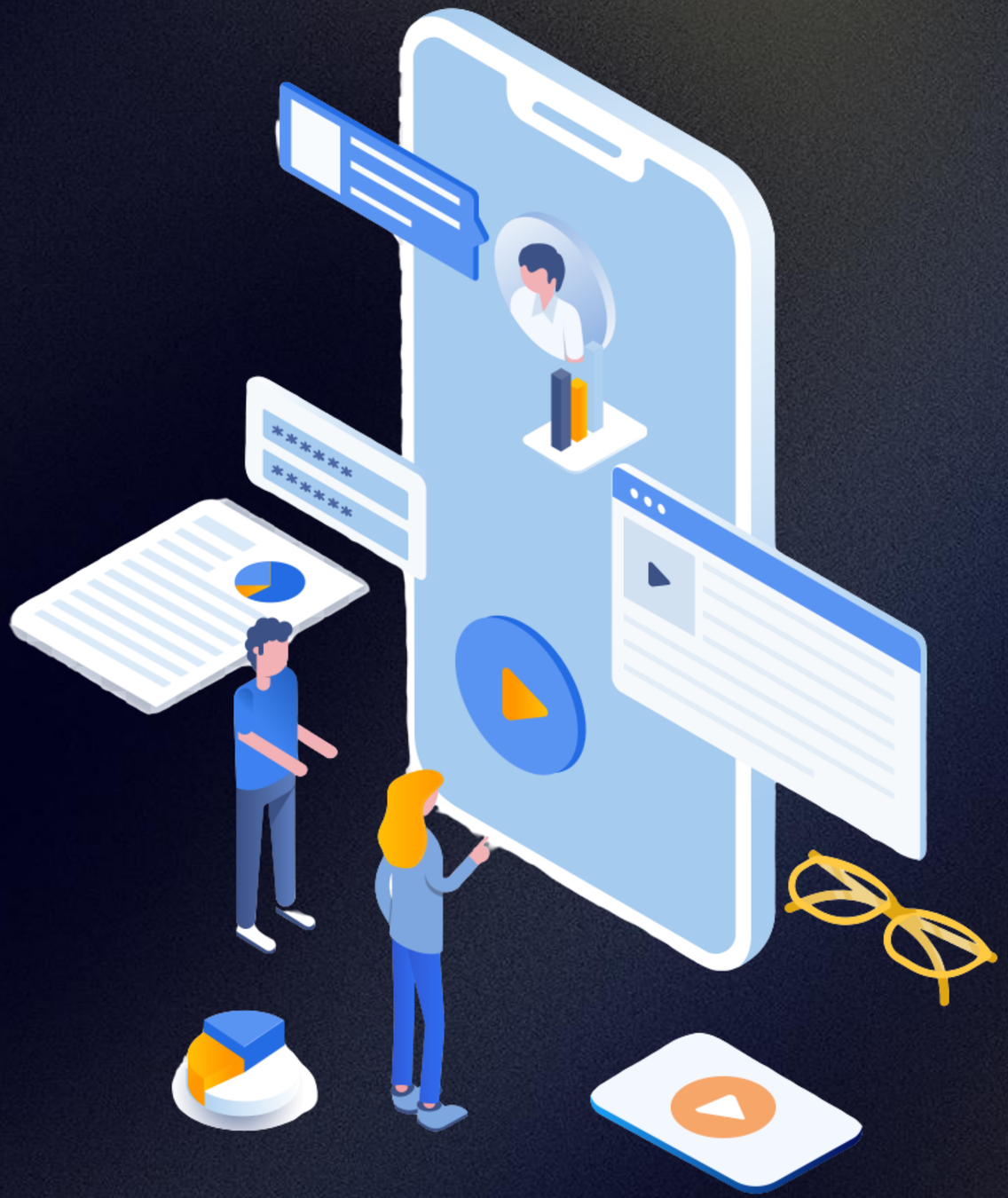
Unauthorized Digging Detection System for Archaeological Sites

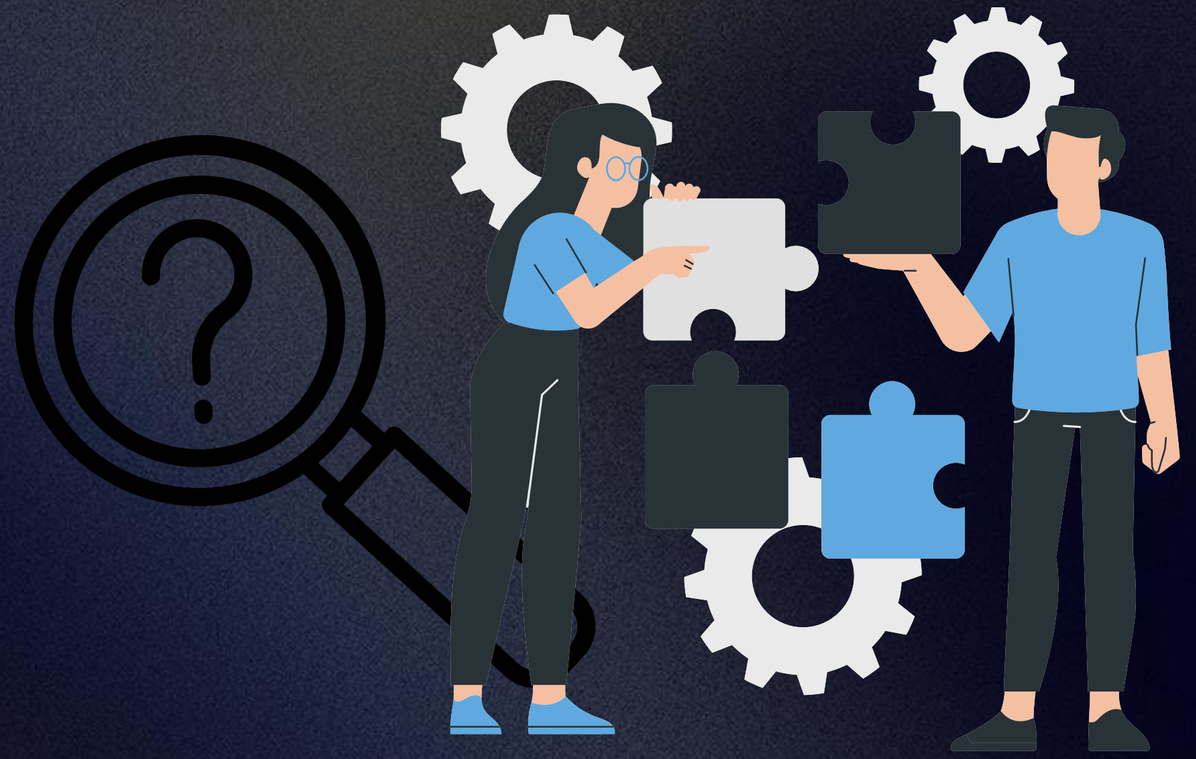


Introduction

Sri Lanka’s archaeological sites are vital cultural treasures but face threats from illegal digging and looting.

We propose an IoT-based smart monitoring system that uses sensors, RFID, and GSM alerts to detect and prevent unauthorized activities in real time.

Problem statement



- Archaeological sites are at risk from illegal digging, looting, and treasure hunting.
- Loss of artifacts, fossils, and ancient structures.
- Lack of real-time monitoring in remote heritage locations.

Proposed Smart Solution

- IoT-based Unauthorized Digging Detection System
- Combines vibration, sound, temperature, piezo sensors, GPS & RFID authentication.
- Real-time monitoring through Firebase + Website Dashboard.
- Instant alerts via GSM SMS to authorities.

Objectives

01 Continuous low-cost monitoring of archaeological sites.

02 Detect and alert unauthorized digging, tampering, fire, or GPS displacement.

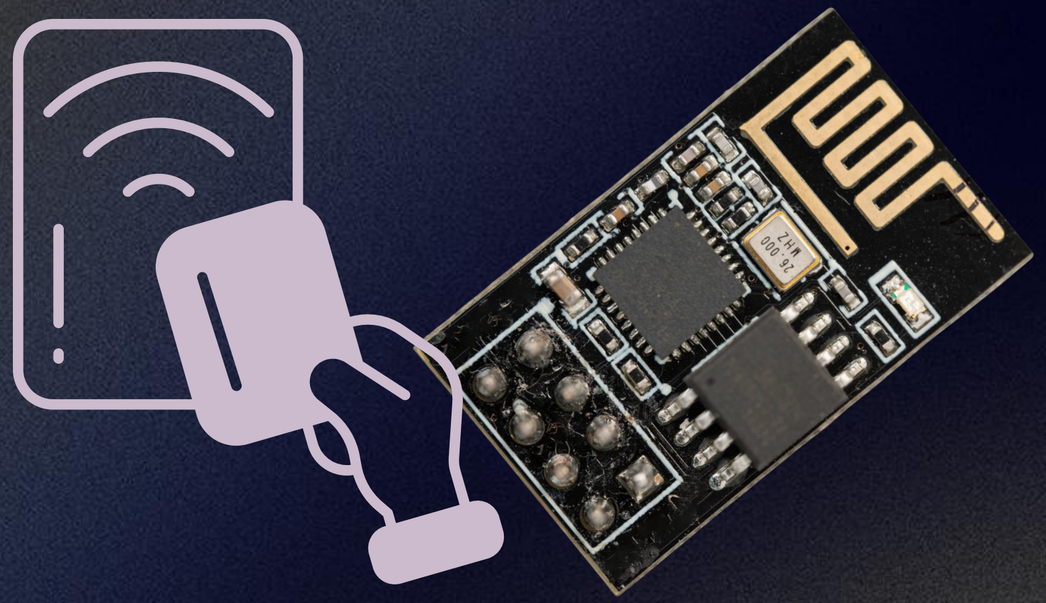
03 RFID authentication for authorized personnel.

04 Cloud-based data logging and remote access.

Key Features

- Real-time sensor monitoring.
- RFID-based authorization.
- Data logging with Firebase.
- GSM SMS alerts for quick response.
- Fire detection & device tamper alerts.
- Web interface for live + historical data.

System Workflow



- Initialization: NodeMCU connects to Wi-Fi & Firebase.
- Authorized Access: RFID scan → Site safe for digging.
- Unauthorized Activity:
  - Vibration + Sound detected
  - Fire via Temperature Sensor
  - GPS movement / Tampering
  - No RFID validation
  - → GSM Alert to Security Authorities

Main Unit

Alarm Unit

Real-World Applications

- Archaeological Site Monitoring
- Forest & Heritage Protection Zones
- Historical Monument Surveillance
- Mining Area Border Control
- Environmental Site Monitoring

Challenges in Sri Lanka

- Network coverage issues in rural archaeological zones
- High cost of large-scale deployment.
- Maintenance in harsh weather conditions.
- Limited awareness & adoption by local authorities.

Thank you.

Thank you for your attention