Smart System for Gold Products

Securing and Tracking Gold Products Using RFID and Cloud Technology

Jordan University of Science and Technology
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The Problem

- Gold and jewelry are high-value items that are often targeted for theft.
- Traditional safes offer physical protection, but no real-time awareness
- There's no alert if gold is removed or the safe is moved
- Shop owners want a smarter, more reliable way to protect their valuables

What’s our Project?

This project introduces a smart safe that uses IOT Technology along with Cloud integration to monitor and Secure Jewelry in real time.

Our Vision and Goal

The goal is to enhance security and make inventory management more reliable.

System Overview

- This project aims to build a smart, affordable safe that protects gold using sensors and real-time alerts.

- It detects theft, tampering, or unauthorized access through weight, vibration, and door sensors, plus a secure keypad.

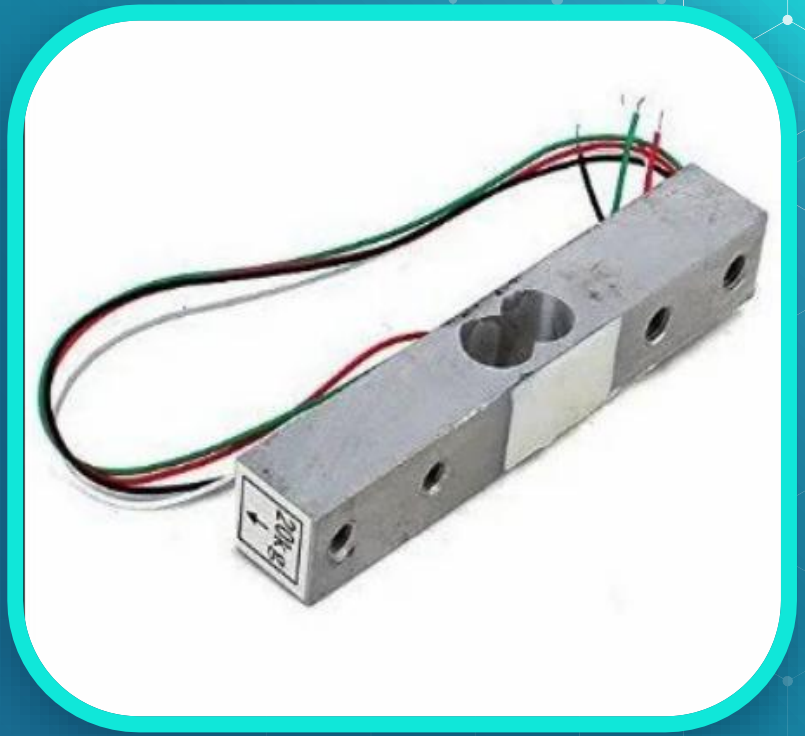
What’s Inside the Smart Safe?

1. Safe Structure
2. Weight Sensor
3. Vibration Sensor
4. Magnetic Sensor
5. Keypad with Dummy PIN
6. Microcontroller
7. Rechargeable Battery
8. GPS Module

Hardware Components

Weight Sensor

Detect weight changes if pieces are removed or added.



Vibration Sensor

Detect unauthorized attempts to break or move the safe.

Keypad

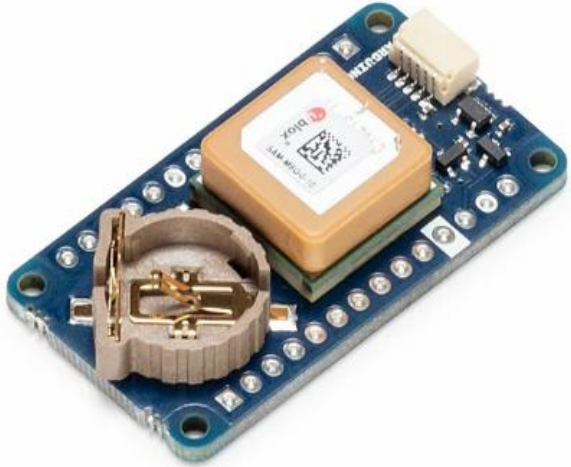
For entering a PIN to access the safe, with a dummy PIN option for threat scenarios.

Magnetic Sensor

To detect if the safe’s door is open

GPS Module

For real time mapping and tracking if it is moved or stolen.



Battery

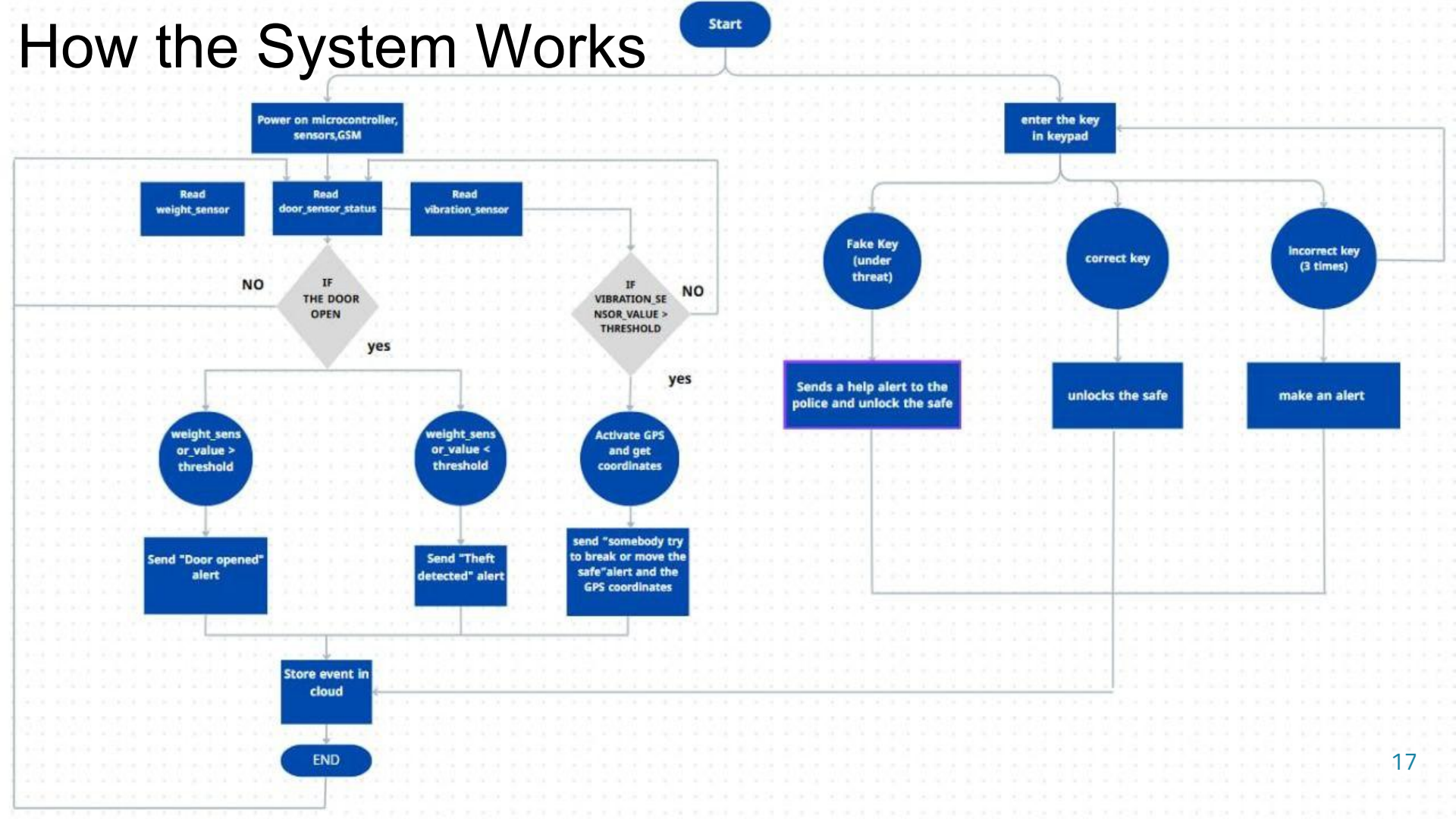
A rechargeable battery to power the system.

microcontroller

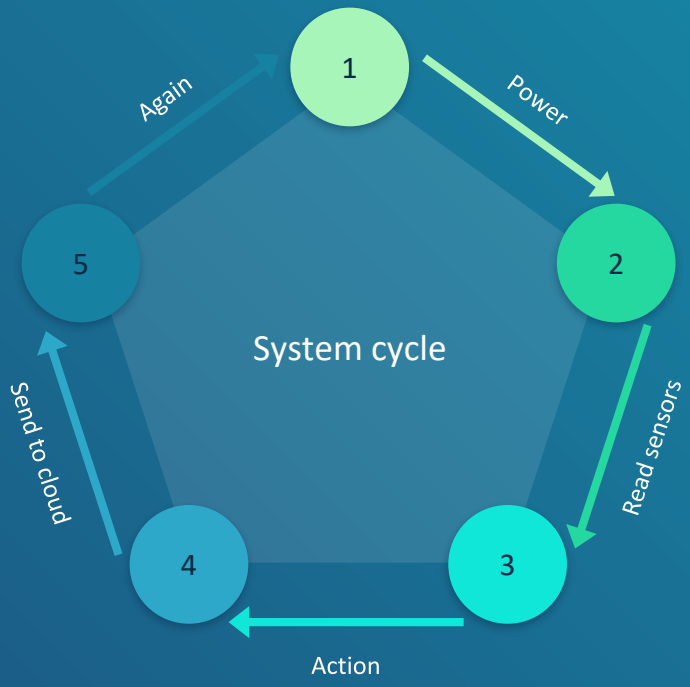
esp32 to process data and control the system.

How the System Works

How the System Works



System Cycle



Cloud System and Benefits

Cloud System

- The smart safe sends sensor data to the cloud
- In case of suspicious activity the cloud triggers real-time alerts
- Possibly Using **Firebase** for real-time database and authentication

Cloud Benefits

- **Real-time monitoring** from anywhere
- **Centralized logs** for access history and alerts
- **Scalable** supports multiple safes or users
- **Secure** data storage and backup

System SWOT

STRENGTHS

Real-time monitoring and alerts

Remote access and management

WEAKNESSES

Requires power and network connectivity

Higher cost

OPPORTUNITIES

Real-time monitoring and alerts

Integration with cloud-based systems

THREATS

System failure affecting accessibility

Cybersecurity risks

Challenges

- Network outages affecting cloud sync
- Power management and battery life
- False positives from sensors
- GPS accuracy in indoor environments

Future Enhancements

- Adding camera module with motion detection
- NFC-enabled unlocking
- AI-based theft pattern recognition

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THANKS!