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**Synopsis Report**

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**Project 1**

**Zigbee Based Underground Mines Parameter Monitoring System**

**for Rescue and Protection**

**Abstract**

This is about continuous monitoring underground coal mines parameter such as carbon monoxide, temperature, water level and use wireless Zigbee technology for communication. A microcontroller-based system is used for collecting and storing data using respective sensors and making decision accordingly, based on which the mine worker is informed through different alarm tone as well as LED display system. The communication system is reliable based on ZigBee, IEEE 802.15.4 standard. This is used for transmission between the hardware circuit fitted in the local site(mines) and the remote monitoring site (computer) through routers. This system is highly beneficial for rescue and protection of miners.

**Advantages**

* Safety monitoring of the environment.
* Improved services in mining.
* Providing wireless connection security.
* Faster checked out/in.
* Prevent from the high temperature, humidity, and harmful gases.
* Quick searching and can able to give the warning.
* Cost avoidance.

**Disadvantages**

* Since the technology used in ZigBee is of low bit rate, the transmission rate of this technology is also low. Which affect the data transmission in underground.
* ZigBee has many security threats like stealing of nodes, loss of services provided by the network, theft of data, etc. It also has compatibility issue.
* Implementing a ZigBee technology is quite expensive as the size and range of the network affect the cost.
* The ZigBee technology can get altered by the Z-wave wireless communication since the latter provides better stability and range.
* This technology is very prone to network interferences because it uses the 2.4GHz band, which is also used by other wireless devices.

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**Project 2**

**Smart Ticketing System for Public Transport Using IoT and Cloud Computing**.

**Abstract**

Public transport system remains a major source of income in most of developing countries like India. But now it faces severe mal function and various security problems. First there is lot of confusion between the passengers regarding the fare it leads to quarrels and corruption. The alternatives techniques introduced to resolve these issues failed drastically. More over in spite of having such a massive amount of data generated of the commuters, no analysis was ever done ever to improve the public transport service and the commuter’s experiences. To overcome the above pitfalls this project proposes a smart ticketing system architecture for public transport which completely scraps the idea of paper tickets and completely harness the amount of money commuters has invested for their travelling. The radio frequency identification card is being reusable. They are most convenient compare to the paper base ticketing system. The RFID card distributes among the public. The unique ID in the RFID card are stored in a database in the internet along with personal data and creates account for each person.

**Advantages**

* Not requiring interaction with staff to load tickets.
* Managing purchase and renewals without queues.
* Smartcards being more durable than paper tickets.
* Purchasing tickets online.
* Storing details so easy to trace/replace.
* Managing one card preferable to multiple tickets.
* It can support a wide variety of function and high capacity to store information on the card.

**Disadvantages**

* Discomfort to retrieve information from a stolen card.
* Smart cards will face the problem of high price of problem compliment. While smart card themselves are nearly cheap, card readers are not.
* We need a smart card reader.
* The biggest problem facing smart card is a level of security.
* In order for smart cards to reach their full potential, must be able to interact with the host of interfaces and must be done so securely.
* The technology is available only for customers who have e-payment apps on their devices.
* The battery of smartphone is should be charged otherwise no payment is possible.

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**Project 3**

**IoT Based Flood Monitoring and Alerting System with Weather Forecasting**

**Abstract**

World climate is drastically changing because of natural calamities like hurricanes, tornadoes, storms, floods, earthquakes, tsunamis. These natural disaster causes great damage and destroy the smooth living of human life causing the reconstruction of all things including the most important basic needs: food, shelter, clothing and water. In these One of the biggest natural disasters India had ever faced was floods in Western Maharashtra in August 2005 and August 2019. The primary objective of this research is to provide an innovative and sustainable solution required to monitor flood situations and perform rescue operations in the worst affected Sangli, Kolhapur and Satara districts. This attempt aims at providing IoT-based flood detection and AI-based rescue operation through the system. This research makes use of Internet of Things and Artificial Intelligence technologies to provide a reliable and implementable solution for the above problem.

**Advantages**

* Timely detection of possible flood risks and floods.
* Tailored solution that can be integrated with external developments at any level (device, connectivity, cloud or user application).
* Creation of historic data for administrations.
* An unlimited number of devices can be included in future extensions.
* Long working life of the equipment.
* Highly reliable and available real time data.
* Total adaptation and integration with emergency plans.
* Low energy consumptions.
* Far reaching bidirectional communication.

**Disadvantages**

* GPRS may be unstable, Networking coverage area cannot be implemented.
* Detection algorithm may fail, doesn't send warning messages.
* No accuracy and reliability is maintained.
* If there is no sufficient data flood prediction cannot be done.
* It uses wireless sensors which are efficient as well as very costly to maintain.
* Some of the devices is not suitable to the implemented in the large network.

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