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SMART HOME SAFETY SYSTEM - MITIGATING SUFFOCATION RISKS AND ENHANCING SAFETY

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ABSTRACT

Smart home safety and security systems have gained important significance over the last many times owing to their notable impact in reducing and precluding losses in coffers and mortal life caused by unwanted situations that could occur while homeowners are far down from their homes. The Smart Home Safety System is a ground breaking result aimed at addressing suffocation pitfalls and enhancing safety in confined spaces. By integrating an array of detectors, mobile connectivity, and real-time cautions, this innovative system aims to minimize suffocation-related losses by furnishing early discovery and a visionary safety approach. This exploration paper explores the system's expansive benefits, advantages, features, and its implicit impact on reducing suffocation-related incidents.

Keywords: Safety System, Mobile Connectivity, Alcohol Discovery, Solar Charging, Detectors.

I. INTRODUCTION

A smart home system is defined as a collection of detectors, selectors, communication bias, and calculating bias that are connected to give homeowners services and operations with minimum or no intervention, still, smart home safety and security systems are in high demand and always demanded for numerous reasons including people's desire to feel safe in their own houses. also, recent advancements in the Internet of Effects (IoT), fund-size microcontrollers, and affordable detector selectors have opened numerous openings to enable safety and security in smart homes. When it comes to our home, security is crucial issue to the general public.[1] Additionally, recent advancements in the Internet of Things (IoT), pocket-size microcontrollers, and inexpensive sensors/actuators have provided many opportunities to enable safety and security in smart homes.[2] Safety and security systems are employed to cover inner surroundings to give homeowners live updates on their mobile phones and admonitions when dangerous situations may arise while they're in the house. The end of these systems is to interpret the sensitive data collected(via detectors) from the girding terrain to issue admonitions or to carry out some applicable conduct(via selectors) against unwanted events. For case, fire in homes could occur for several reasons, similar to the burning of accouterments, feasts, and electrical circuits, which could beget serious accidents. To cover homes from fire and gas leakage we use Mq- 2 detector for discovery. Fire alarm systems are veritably useful in advising homeowners about this uninvited situation and to help the loss of coffers and mortal life that could be affected by it. Gas leakage is another unwanted situation. thawed petroleum gas(LPG) is the most extensively used gas for cooking in homes. It's handed in cylinders and may blast due to leakage. In numerous cases, residents don't know that gas is oohing. They thus may light up the fire that causes a blast. To avoid this dangerous situation, a gas leakage discovery detector is also installed in our system. The Smart Home Safety System includes an alcohol detector, enabling the discovery of alcohol vapors in the air. By detecting the presence of alcohol, the system can give warnings and cautions to individuals, icing they're apprehensive of implicit pitfalls and can make informed opinions. The work of smart home safety and security systems starts with covering the girding terrain and also replying to the below-mentioned unanticipated incidents that may occur while homeowners are down by transferring alert announcements. In addition, some conduct may also be taken by the systems similar to alert announcements on their mobile phones. To enhance its sustainability and versatility, the Smart Home Safety System incorporates solar charging capabilities. It features an erected- solar panel that harnesses solar energy to charge the device's battery. This allows the system to operate singly of electrical outlets, making it suitable for remote or out-of-door locales where access to electricity may be limited. The solar charging point ensures nonstop functionality, indeed in areas with unreliable or no power forces. also, they may use selectors similar to buzzers, lights, and defenses to notify near people. A communication medium is needed to interact with these systems. Wireless communication, similar to the Global System for Mobile Dispatches(GSM), Bluetooth, and WiFi, is extensively used in this environment.

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II. METHODOLOGY

The Smart Home Safety System is a ground breaking solution aimed at addressing suffocation risks and enhancing safety in confined spaces. By integrating an array of sensors, mobile connectivity, and real-time alerts, this innovative system aims to minimize suffocation-related fatalities by providing early detection and a proactive safety approach. This research paper explores the system's extensive benefits, advantages, features, and its potential impact on reducing suffocation-related incidents. Suffocation incidents within confined spaces, such as homes and rooms, pose a significant threat to individuals' safety. These incidents can result from various factors, including smoke, harmful gases, extreme temperature conditions, and even alcohol consumption. The Smart Home Safety System represents a comprehensive solution designed to mitigate these risks by incorporating a range of sensors and advanced features

1. Early Detection and Prompt Alerts:

The Smart Home Safety System boasts advanced smoke and gas sensors that enable the early detection of potential hazards. When abnormal levels are detected, the system triggers immediate alerts, including loud alarms and mobile notifications. This early warning empowers occupants to take swift and informed actions, potentially saving lives and preventing suffocation-related deaths.

2. Carbon Monoxide (CO) Detection:

One of the most insidious threats within homes is carbon monoxide (CO), a silent and odorless gas that can be lethal. The system's dedicated CO sensor plays a crucial role in promptly alerting individuals to its presence. This allows for a rapid evacuation and the summoning of medical assistance when necessary, thereby mitigating the risk of CO-related suffocation incidents.

3. Comprehensive Gas Detection:

In addition to CO, the system's gas sensor array monitors various hazardous gases, including LPG. This expanded capability enables the system to address a wide range of potential suffocation risks, such as gas leaks from cooking appliances or faulty connections. Detecting these gases in a timely manner empowers users to take immediate action, thereby preventing suffocation and mitigating the risk of explosions or fire hazards.

4. Temperature and Humidity Monitoring:

Extreme temperature or humidity conditions can contribute to discomfort, difficulty in breathing, and potentially exacerbate suffocation risks. The integration of a DHT22 sensor allows continuous monitoring of temperature and humidity levels within the room. By monitoring these parameters, individuals can take proactive steps to maintain a safe and comfortable environment, thus reducing the chances of suffocation-related incidents.

5. Mobile Connectivity and Remote Monitoring:

The system's dedicated mobile application provides real-time monitoring, control, and notifications. Users can remotely access sensor readings, view current conditions, and receive instant alerts on their mobile devices. This feature enables individuals to monitor their homes or spaces from anywhere, ensuring continuous surveillance and timely response to any suffocation risks.

6. Historical Data Analysis and Optimization:

The Smart Home Safety System logs sensor data over time, allowing users to analyze historical trends and patterns. This valuable information can be used to identify recurring suffocation risks, optimize environmental conditions, and implement necessary preventive measures. By understanding the patterns of gas emissions, temperature fluctuations, or humidity levels, individuals can proactively address potential suffocation hazards and improve overall safety.

7. Peace of Mind and Increased Safety:

Implementing the Smart Home Safety System provides individuals with the assurance that their living or working environment is continuously monitored. The system acts as a proactive safeguard against suffocation risks, providing a higher level of safety for occupants. This peace of mind contributes to improved well-being and reduces the likelihood of suffocation-related incidents.

Reducing Suffocation-Related Deaths:

The Smart Home Safety System plays a vital role in reducing suffocation-related deaths through the following mechanisms:

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- Early Warning:

The system provides early detection of smoke, hazardous gases, and abnormal environmental conditions. Early warnings allow individuals to evacuate promptly, significantly reducing the risk of suffocation.

- Rapid Response:

Real-time alerts through alarms and mobile notifications ensure that occupants are immediately informed about potential suffocation risks. This prompt response enables them to take necessary actions, such as leaving the area, contacting emergency services, or seeking medical assistance.

- Prevention of Fire Hazards:

By detecting smoke and potentially flammable gases, the system helps prevent fire hazards that can lead to suffocation-related deaths. Timely alerts enable users to extinguish small fires or evacuate before the situation worsens.

- Continuous Monitoring:

The system's continuous monitoring capabilities ensure ongoing surveillance and prompt alerts for any changes in the environment. This proactive approach significantly reduces the probability of suffocation incidents going unnoticed.

Additional Features:

Alcohol Detection:

The Smart Home Safety System includes an alcohol sensor, enabling the detection of alcohol vapors in the air. This feature helps prevent suffocation incidents related to alcohol consumption in confined spaces. By detecting the presence of alcohol, the system can provide warnings and alerts to individuals, ensuring they are aware of potential risks and can make informed decisions.

Portability and Recharge ability:

The system is designed to be portable, allowing users to easily move it between different rooms or even take it on the go. The device is compact and lightweight, ensuring convenience and flexibility in its placement. Additionally, the system is rechargeable, eliminating the need for constant battery replacements. Users can simply connect it to a power source for recharging, making it cost-effective and environmentally friendly.

Solar Charging Capability:

To enhance its sustainability and versatility, the Smart Home Safety System incorporates solar charging capabilities. It features a built-in solar panel that harnesses solar energy to charge the device's battery. This allows the system to operate independently of electrical outlets, making it suitable for remote or outdoor locations where access to electricity may be limited. The solar charging feature ensures continuous functionality, even in areas with unreliable or no power supply.

III. HARDWARE REQUIREMENT

Node MCU ESP 8266.
Humidity sensor DHT 11.
Temperature sensor.
Mq2
Mq5
MQ 8 these are various gas sensor.
Alarm Bazaar
LED light.
Solar panels
Lithium and batteries
LDR sensor.

IV. SOFTWARE REQUIREMENT

Blink Iot app
Embedded C ,C++

V. CONCLUSION

The Smart Home Safety System offers a comprehensive and advanced solution for ensuring safety in confined spaces. By combining the ability to detect smoke, harmful gases, temperature extremes, humidity levels, and alcohol, along with the device's portability, recharge ability, and solar charging capabilities, this innovative system provides a holistic approach to safety. It empowers individuals to proactively address suffocation risks, reduce suffocation-related deaths, and ensure a safer living or working environment for all occupants.

The Smart Home Safety System, with its early detection capabilities, mobile integration, and comprehensive monitoring, offers significant benefits in mitigating suffocation risks. By proactively detecting smoke, harmful gases, and adverse environmental conditions, the system enhances safety and helps reduce suffocation-related deaths. This project empowers individuals to take immediate action, ensuring a safer living or working environment for all occupants.

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