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SHORT COMMUNICATION

Contribution of the Internet of Things to the Security System

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ABSTRACT

Utilizing the Internet of Things (IoT), it is now possible to secure people's lives, businesses, schools, organizations, and residences by utilizing alarm security systems that will monitor, direct, and protect against burglars and kidnappers while also making life easier. This essay will examine relevant works on the security alarm system, including their history, technological advancements made possible by the IoT, difficulties encountered while utilizing the Internet to operate the security alarm system, and effects of installing one.

Key words: Contribution of internet of things, security system, theft

INTRODUCTION

Smart houses are defined as residential buildings that have a variety of networked systems and devices that allow for the automation, control, and monitoring of numerous household chores and appliances. Homeowners can remotely or through voice commands manage and improve their living space thanks to these sophisticated technologies. Smart thermostats, lighting systems, security cameras, door locks, and home entertainment systems are common components of smart homes. These devices can be connected to and managed by a central hub or smartphone app. Convenience, energy efficiency, improved security, and the capacity to modify and personalize the home environment in accordance with personal preferences are all provided by this integration. Greater comfort, efficiency, and peace of mind are all benefits of smart homes, which are transforming the way we interact with our living spaces.[1-8] The adoption of smart homes must take security seriously. It is essential to make sure that the data and privacy of homes are protected given the rise in linked devices and systems. Potential security risks for smart homes include illegal device access, hacking attempts, and data breaches.[9,10] Strong authentication systems, encrypted communication protocols, routine software updates, and secure network settings must all be put in place to reduce these dangers. Homeowners should also adhere to recommended practices including using strong passwords that are unique, activating two-factor authentication, and being cautious when allowing access to third-party programs. Systems of constant observation and surveillance can also aid in the fast detection of any security breaches.[11] Smart houses can give homeowners peace of mind by emphasizing security measures, ensuring that their living areas are shielded from potential threats.[12-15] Security based on the Internet of Things (IoT)[16] is essential for safeguarding smart homes and all of their linked gadgets. A smart home's numerous systems and equipment may communicate and share data thanks to IoT technology, which improves ease and automation.[6] However, this interconnection also offers possible weaknesses that malevolent actors may exploit. IoT-based security is concerned with putting safeguards in place to protect these gadgets and the communication networks they depend on. This involves taking precautions including using strong authentication and authorization mechanisms, encrypting data transmissions, updating software often, and watching out for any unusual activities.

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Implementing secure gateways, intrusion detection systems, and firewalls can also aid in defending against external attacks. Smart homes may make sure that the advantages of connected devices are maximized while limiting the dangers associated with illegal access, data breaches, and privacy concerns[3,17-20] by emphasizing IoT-based security. A network of linked systems, sensors, and gadgets that communicate and share data make up the IoT structure. Everyday items such as refrigerators, cars, and even clothing are integrated with sensors,[21] software, and connection capabilities in this complex ecosystem. These gadgets collect and transmit data online, enabling seamless automation and integration. The devices themselves, the network infrastructure that facilitates connectivity, and the cloud-based platforms or apps that process and analyze the gathered data make up the three primary parts of the IoT system. Real-time monitoring, remote control, and data-driven decision-making are made possible by this networked system. Businesses and individuals can use the IoT structure to take advantage of connectivity's capacity to streamline operations, boost productivity, and open up new opportunities across a range of sectors.[22-28] The design and implementation of an effective system aimed at securing homes and other institutions against the risk of theft may be summed up as the research contribution in this work. The suggested solution is based on two main strategies: The first one makes use of fingerprint technology,[29,30] while the second one makes use of cameras built within the Telegram app. The camera records the intruder's image and sends it to the homeowner through Telegram if there is an attempt at theft or tampering.[31] This study uses ESP-Mesh and the IoT to monitor housing. Although the system developed for this study has been functioning successfully, there is a noticeable latency because the ESP-Mesh protocol is used.[32] Because of the ESP-Mesh protocol's ability to self-heal, when one node is not connected, the remaining nodes will establish a connection to the Mesh server.[33,34] Due to each node's responsibility for message delivery, the ensuing latency will be extremely substantial, especially for the nodes that are farthest distant from one another.[35] The method that has been developed allows both homeowners and the head of security to keep tabs on the state of the housing stock. In addition, when something goes wrong in the monitored home, the head of security and homeowners are alerted through the LINE messaging service, allowing them to take the appropriate action right away [Figure 1].[36]

BENEFITS OF A HOME SECURITY SYSTEM WITH IOT CAPABILITY

Control and observe security

By using AI to improve the functionality of gadgets such as CCTV cameras, smart lights, doorbells, and fire sensors, IoT offers smart home security. Data loss protection, secure connectivity, and device control are typical use cases for IoT smart security solutions.

Alert and attempt

The IoT-connected devices connected to remote monitoring alert you to any unexpected behavior and keep you updated on every little detail of your home in real time. Thanks to excellent IoT app development, you hold the key to the future of home security in your hands.

AI is used by home IoT devices to detect environmental changes and notify consumers. Even from a distance, you can keep an eye on your house. In reaction to the alarm, the gadgets take some sort of action.

Visitor identification

You can speak with visitors using smart IoT devices with video capabilities. Even while you are gone, you can see the guests on your smartphone and

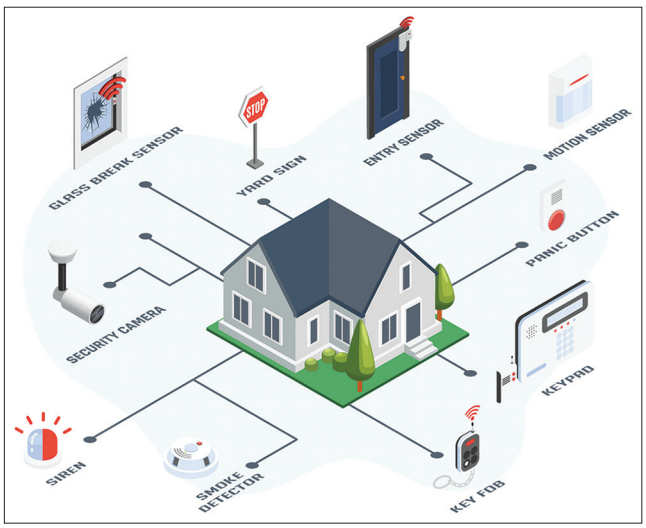

Figure 1: How the internet of things is used in home security alarm systems

communicate with them without having to unlock your door. It guarantees total convenience and security.[37]

CONCLUSION

As a result of properly addressing the drawbacks of conventional security systems, the IoT-based burglary detection system described in this paper has offered a dependable and effective solution to improve home security and prevent burglaries. The advantages of IoT-enabled home security equipment were also covered.

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