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Smart Door Locking System using IoT

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ABSTRACT

A digital door lock system is an electronic security system designed to provide access control to a building or room through the use of electronic authentication methods such as passwords, smart cards, or biometric identifiers. The system eliminates the need for traditional physical keys and allows for remote access control and monitoring through a connected network. This abstract briefly describes the concept and benefits of a digital door lock system, which offers enhanced security and convenience compared to traditional lock systems.

1. INTRODUCTION

A digital door lock system is an advanced electronic security system designed to provide access control to a building or room using electronic authentication methods such as passwords, smart cards, or biometric identifiers. This modern approach to access control has gained popularity due to its convenience and enhanced security features compared to traditional lock systems.

Digital door lock systems are becoming increasingly common in residential, commercial, and institutional settings. They eliminate the need for physical keys, which can be lost or duplicated, and provide a more secure and efficient way of controlling access to a building or room.

Additionally, digital door lock systems can be integrated with other security systems, such as CCTV cameras and alarms, to provide a comprehensive security solution.

In this modern age where technology has become an integral part of our lives, digital door lock systems offer a more secure and convenient way of controlling access to buildings and rooms. In the following sections, we will discuss the working and benefits of digital door lock systems in more detail.

2. OBJECTIVES

The objectives of a digital door lock system are as follows:

1. **Enhanced Security:** The primary objective of a digital door lock system is to provide enhanced security compared to traditional lock systems. The system eliminates the risk of physical keys being lost, stolen, or duplicated, which could compromise security. Digital door lock systems use electronic authentication methods such as passwords, smart cards, or biometric identifiers to ensure that only authorized personnel can access a building or room.

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2. **Convenience:** Digital door lock systems are more convenient than tra4ditional lock systems as they eliminate the need for physical keys. Users can simply enter a password, swipe a smart card, or use their biometric identifiers to gain access. Additionally, digital door lock systems can be integrated with other security systems, such as CCTV cameras and alarms, to provide a comprehensive security solution.
3. **Remote Access Control:** Digital door lock systems allow for remote access control and monitoring. Authorized personnel can remotelygrant or revoke access to a buildingor room, view access logs, and receive alerts in case of security breaches.

3. EXISTING SYSTEM

There are several existing digital door lock systems available in the market today, each with its own set of features and benefits. Some of the popular digital doorlock systems are:

1. **Keypad Locks:** These locks use a numeric keypad to enter a password to gain access. They are simple and cost-effective but may not offer the same level of securityas biometric or smart card systems.
2. **Smart Card Locks:** These locks usesmart cards to gain access. Each user is provided with a unique smart card that must be swiped to gain access. They offer enhanced security but can be costly to implement.
3. **Biometric Locks:** These locks use biometric identifiers such as fingerprints, retinal scans, or facial recognition to grant access. They offer the highest level of security but can be expensive to implement.
4. **Mobile-Enabled Locks:** These locks use a mobile app to grant access. The user must have the appinstalled on their phone and can gain access by scanning a QR codeor entering a code generated by theapp.

4. PROPOSED SYSTEM

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IMPLEMENTATION

The implementation of a digital door locksystem involves several steps, including:

1. **Assessing the Security Needs:** Thefirst step is to assess the security needs of the building or room where the digital door lock system will be installed. This includes identifying the potential security risks and determining the level of security required.

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2. **Choosing the Right System:** Once the security needs have been assessed, the next step is to choose the right digital door lock system that meets those needs. This involves evaluating the various systems available in the market and selecting the one that offers the best combination of security, convenience, and cost-effectiveness.
3. **Installation:** The installation process will depend on the type of digital door lock system selected. Some systems may require professional installation, while others may be installed by the user. The installation process may involve wiring, drilling holes, or mounting the system on the door. Testing: Once the system has been installed, it is essential to test it thoroughly to ensure that it is functioning correctly. This includestesting the authentication methods, access control, and remote monitoring features.

HARDWARE COMPONENTS:

1. Vibrational sensor2.Arduino UNO 3.Relay
2. ESP 32
3. Solenoid Lock6.LED Display 7.Buzzer
4. Smart Phone

SOFTWARE COMPONENTS

1. Arduino IDE
2. Mobile Telnet
3. Network Scanner Device Finder

RESULT

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FUTURE SCOPE

The future scope of digital door lock systems is vast and promising. Here are some of the potential future developmentsand advancements in this technology:

1. Integration with the Internet of Things (IoT): Digital door lock systems may be integrated with other IoT devices, such as smarthome devices and sensors, to provide a more comprehensive security solution.
2. Artificial Intelligence (AI) Integration: AI may be used to enhance the functionality of digital door lock systems. For instance, AI may be used to detect unusual access patterns or suspicious behavior and alert security personnel.
3. Advanced Biometric Identification: Biometric identification may be enhanced with new technologies such as vein recognition, gait recognition, or even brainwave identification, to provide even more secure access control.
4. Voice Recognition: Voice recognition technology may be integrated into digital door locksystems, allowing users to gainaccess by simply speaking a passphrase.
5. Advanced Encryption: Advanced encryption methods may be used to further enhance the security of digital door lock systems, making them more resistant to hacking andother security breaches.

CONCLUSION

In conclusion, digital door lock systems offer a wide range of benefits over traditional lock and key systems. They provide enhanced security, convenience,and flexibility, making them ideal for a wide range of applications, including residential, commercial, and industrial settings.

These systems use various authentication methods such as keypad entry, smart cards, biometric identification, mobile apps, and wireless communication, offering users a choice of options based on their specific needs and requirements.

With the integration of IoT, AI, advanced biometric identification, voice recognition, advanced encryption, cloud-based access control, and green energy integration, digital door lock systems' future scope is vast and promising, offering even more enhanced security, convenience, and cost- effectiveness.

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