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IMPLEMENTATION OF IOT BASED SMART SECURITY SYSTEM

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Abstract:

Internet of Things (IoT) technology has opened up doors of opportunities for development of smart systems and applications. With IoT it has now become possible to design the simple systems to control the devices machines and processes. The smart systems are future of all the technological advancements in coming days. IoT has become the popular technology because of the supporting open access softwares and hardware. Authors have developed the smart security system for household using IoT. The implementation of the same system is presented in this paper. Integration of different sensors with internet is useful to design the different systems to control the operations.

Keywords: Internet of Things (IoT), smart systems, softwares and hardware, smart security system

INTRODUCTION:

Smart systems are the basis for industrial evolution 4.0. Industrial and home automation systems are basically working to control the operations and processes from remote places. This project presents the implementation of the smart system for granting the access to the person to enter in house with verification of identity by means of face or biometric recognition. The system is developed to control the operation from remote places also.

Every individual has got unique body features such as figure prints face, etc. The human body has the privilege of having features that are unique and exclusive to each individual. Authors have proposed the system based on identification and recognition of these unique features of human body.

Biometrics had been proven to be effective in terms of reliability, security and maintaining the privacy. The biometric system is being popularly used in many places now a days for attendance monitoring. Authors have developed an IoT based system for recognition of person and to grant the access to home with biometric or face recognition.

The main objectives of the implemented system are:

- Real time authentication system using finger print module.
- Door accessing using relay switch
- Wrong authentication capture of image using camera
- Email alerts through image using Wi-Fi
- PC application based data base storage for door accessing

Face, palm and figures recognition has made biometric applications popular. Biometric systems are very accurate and reliable now a days. Fingerprint verification is one of the oldest known biometric techniques known but still is the most widely used because of its simplicity and good levels of accuracy.

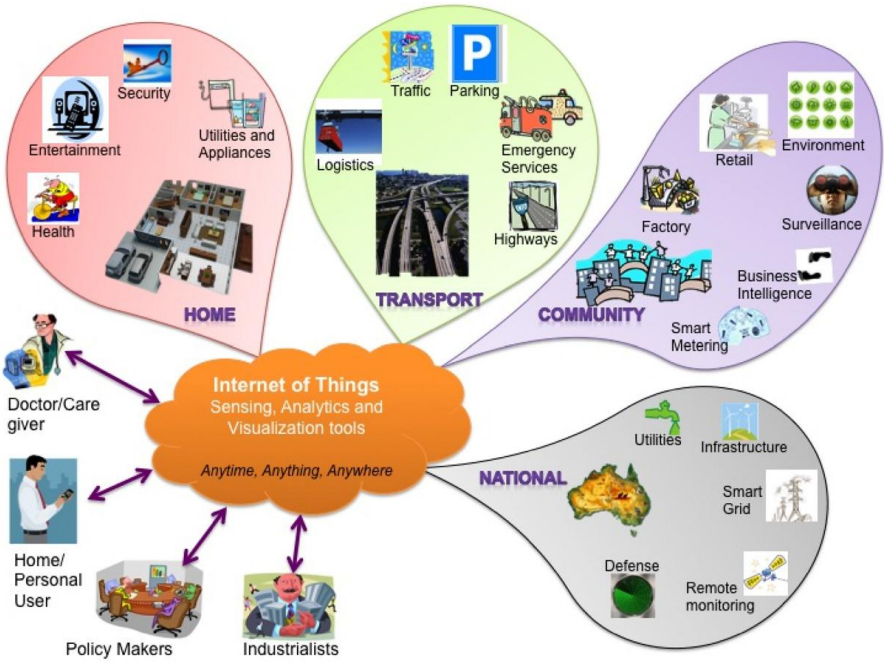

Fig.1: Internet of Things schematic showing the end users and application areas based on data

The Internet of Things is one of the fastest growing technologies with many applications from industrial and home automation to the automobile applications. It has made it possible not only to control the operations but to save and analyze the data in real time.

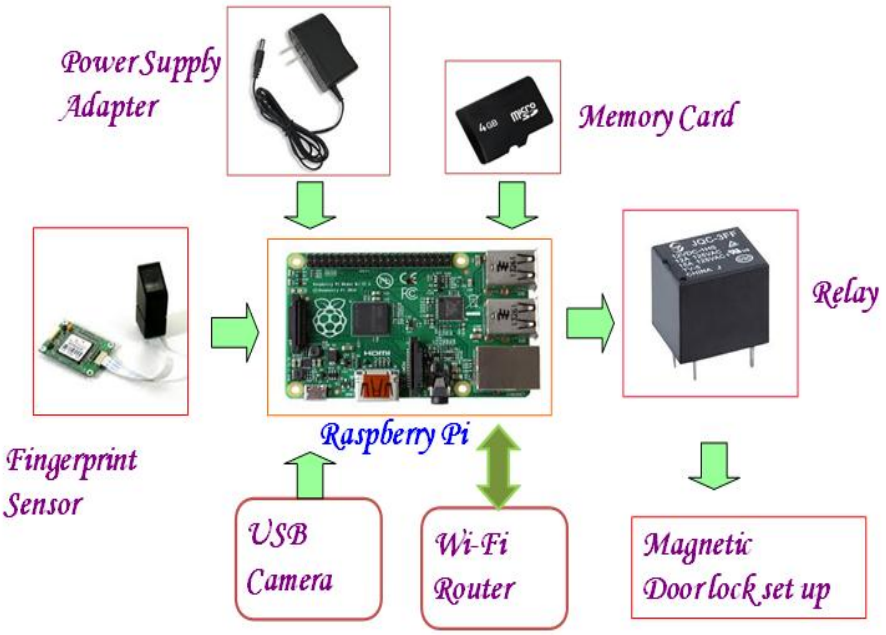

Fig.2: System Block Diagram

Authors have used the finger print module, Wi-Fi module, and Raspberry Pi processor for developing the prototype. The processor reads the input from the finger print module and when the authentication details are correct then the system automatically opens the magnetic door lock and closed after predefined time using relay switch.

SYSTEM COMPONENTS AND DEVELOPMENT:

Following components are used for development of the smart security system.

Sr. No.	Component	Image/ Figure
1	ARM 11 (Raspberry Pi) processor	
2	Biometric Scanner	
3	Electromagnetic Lock	
4	USB Camera	
5	Wi-Fi Router	
6	Relay Module	

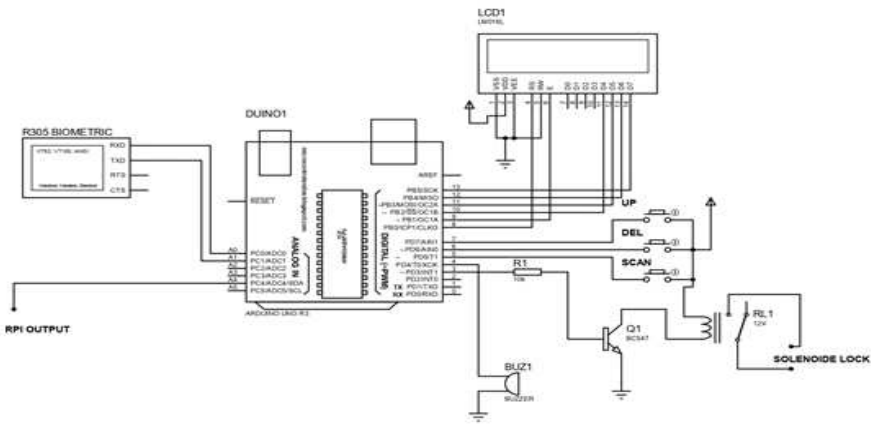

Fig.3: Implemented system module

Fig.4: Developed Hardware

The developed hardware is presented in the figure above for implementation of smart security system. The system captures the face image and if it matches with the saved image the door opens. Any person whose face image was not saved on the system will get entry in the house only after it is allowed by the authorised person upon verification of the person by means of video.

CONCLUSION:

Internet of thing is changing the human life with better experiences of controlling the operations, processes and applications. In coming years the IoT will become an integral part of human life. With the new technological advancements in relaying and controlling devices it has become easy to design the new systems for different applications. Authors have presented the implemented system of smart security designed for the purpose of household applications in this paper. The prototype was developed and the system is found working properly for face recognition application and opening the door.

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