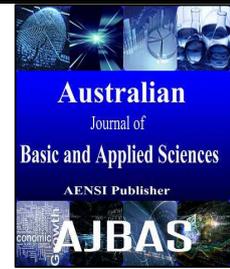




AUSTRALIAN JOURNAL OF BASIC AND APPLIED SCIENCES

ISSN:1991-8178 EISSN: 2309-8414
Journal home page: www.ajbasweb.com



ATM System Availability for People with Visual Impairments using RFID Technology

¹Mrs. A. Sathya, ²Mrs. K.Valarmathi and ³Mr. M.Arun

¹Assistant Professor Department of IT Easwari Engineering College Chennai

²Assistant Professor Department of IT Easwari Engineering College Chennai

³Assistant Professor Dept. of ECE Panimalar Institute of Technology Chennai

Address For Correspondence:

Mrs. A. Sathya, ATM System Availability for People with Visual Impairments using RFID Technology.
E-mail: arunachalam.sathya@gmail.com

ARTICLE INFO

Article history:

Received 10 December 2015

Accepted 28 January 2016

Available online 10 February 2016

Keywords:

Embedded technology, Talking ATM (Automated Teller Machine), human interference, visually impaired, RFID (Radio Frequency Identification Device) tags and readers.

ABSTRACT

The Embedded Technology is proving its remarkable achievement in all fields. Embedded System is a combination of hardware and software. Embedded technology plays a major role in integrating the various functions associated with it. This needs to tie up the various sources of the department in a closed loop system. This proposal greatly reduces the manpower, saves time and operates efficiently without human interference. Recently it has been investigated the potential applications on Radio Frequency Identification Devices (RFID) for particular problems. This paper puts forth the first step in achieving the desired target with some of its applications being developed. With the advent in technology, the existing systems are developed to have in built intelligence. A Talking ATM is a type of automated teller machine (ATM) that provides audible instructions, so that persons who cannot read an ATM screen can independently use the machine. All audible information is delivered privately through a standard ATM Machine. This technology helps the visually impaired people to withdraw the money from the bank by giving voice as input

INTRODUCTION

For a few years, RFID technology has proved remarkable improvements in the fields of defense, animal identification, factory data collection and so on. Radio frequency identification is the wireless use of electromagnetic fields for transferring data and it is used for automatic identification and tracking of attached objects. The RFID technology contains two components; they are the RFID tag number and RFID reader. The former is further classified into two. They are the active tags and passive tags. The active tags have battery attached to it and send data periodically using the ID. On the other hand the passive tags do not have battery and instead they use the radio energy from the readers (Raza, N., 1999). It can only receive data but cannot send. The RFID tag number contains 96 bit string of data. The first 8 bit identifies the version of the protocol, the next 28 identifies the organization that manages the data, the next 24 bit identifies the type of product and the last 36 bits are the unique serial number for a particular tag. Similarly the latter is classified into three types, they are 1) Passive readers Active tags-Only receives signal from active tags. 2) Active reader Passive tags-This transmits the signal and also receives replies from passive tags. 3) Active reader Active tags-uses active tags with an interrogated signal from the active reader. These two components play a major role in determining the objects. RFID technology is not something new; its potential applications are widely utilized in various fields and even in healthcare sectors.

The emerging RFID concept is being widely used since the cost of the tags and readers are cheap ranging from \$1-\$25 and most of its implementation has proved to be successful.

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To Cite This Article: Mrs. A. Sathya, Mrs. K.Valarmathi and Mr. M.Arun., ATM System Availability for People with Visual Impairments using RFID Technology. *Aust. J. Basic & Appl. Sci.*, 10(1): 248-250, 2016

Related Works:

Most of the past works in RFID technology has been majorly focused on navigation and way findings. According to Kristin S. Till H. (2010), assistive technology is used with both hardware and software in order to reach his/her special needs such as blindness. Similarly the England assistance technology act of 1998(defines an assistive technology device as"... any item, piece of equipment or product system, whether acquired commercially off the shelf, modified or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities"). With advent of these technologies, the accessing power of information by disabilities like blind people became more critical and vital in today's materialistic world.

A. Automated teller machines:

ATM's are a common form of public access terminal, and are used generally for many years. There are various applications used in this system like withdrawal, balance checking, Depositing ,transfer of money, entering PIN ,and all other basic transactions to be done from one corner to the other. Recently there has been numerous specifications and options used such as the audible prompts or audible output of non-confidential information, facilities of using keypads to overcome the problems faced in touch screen, illuminated card slots, multi-lingual display screens. Visually impaired persons may encounter a lot of problems when facing ATM's like learning where exactly the objects are located on the screen, deleting files accidentally during any withdrawal of money etc. Certain Biometric features are being studied to ensure and overcome these situations in a more secure manner.

B. Visual Impairments:

Impairment is generally defines as the functional deficit compared to what is commonly viewed as "norm". Some of the vital reasons are cataracts, macular degeneration, glaucoma, diabetic retinopathy, trachoma, and other retina disorders Microsoft Encarta (2000).These users have struggled for many years on interacting with machines or systems in terms of accessing information, processing information and also for a task to be done. According to the definition and classification of visual impairments as stated by Silvia D. *et al* (2006),the visual function consists of different specific perceptual abilities, among which are:"Visual acuity(or visus)"- the capacity of focusing on details ,both from far way and nearby, "Visual field dimension"-the amplitude of the space one can embrace at a glance, "Chromatic sense"-the perceptual capacity allowing color distinction, "Light sensitivity"-the eye reaction to light and light variations.

III. Design And Implementation:

The overall mechanism helps a visually impaired person to withdraw the money without depending upon a third person. This eventually provides their information secured and also by satisfying their needs. Our system consists of RFID tags, Automated teller machine, ATM card, voice IC, speakers. The RFID tags are attached to the individual ATM cards. When a person inserts the card into the automated teller machine he/she is allowed to choose their language initially. Now the PIN (Personal Identification Number)is entered. After this, the user is provided with various options to select their type of savings which can be intimated through VOICE IC for speech recognition. Finally the amount to be withdrawn is given through the same process and is delivered. Since our existing system for visually challenged people doesn't provide the basic ATM facilities such as money withdraw, balance enquiry, etc. These drawbacks can be avoided by using talking ATM where the voice is given for a particular transaction and details have been intimated to the person using the VOICE IC. The door is opened in the ATM as soon as the ATM card is placed in the READER. The particular details of the ATM card are displayed in the PC. When the password is entered, the voice is used to indicate whether the password is correct or not. After the password verification, the amount has been entered using the VOICE and the amount is processed. The amount is taken by the person.

A. Module Diagram Of Proposed System:

The module diagram for the proposed system plays an important role in delivering the entire process.

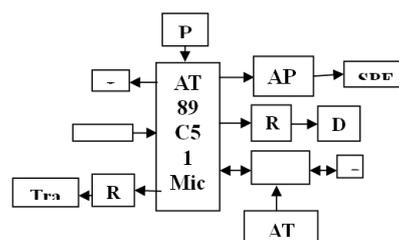


Fig. 1: Block Diagram.

The above module diagram of our proposed system, we using AT89C51 microcontroller to overcome the drawbacks of existing system with new interface technology. This technology helps the visually impaired people to withdraw the money from the bank by giving voice as input. When the voice is given, the particular transaction details have been intimated to the person using the APR 9600 VOICE IC. The door is opened in the ATM when the ATM card is placed in the READER. The particular details of the ATM card are displayed in the PC. When the password is entered, the voice is used to indicate whether the password is correct or not. After the password verification, the amount has been entered using the VOICE and the amount is processed. The amount is taken by the person.

C. *Expected Output:*

As visually impaired persons will always find it difficult to enter PIN numbers and proceed with further transactions, we find it a challenge of providing excellent features in the field of biometrics with various options and facilities. The obvious advantage of this system and its applications helps the user with greater level of security and find it easier to use.



Fig. 2: Sample User.

Conclusion:

People who are visually impaired encounter many problems which act as a barrier to utilize the applications of electronic devices and secured privacy system in them. When commercial sectors or government agencies do not take remedial measures for providing the necessary facilities, it may be necessary to acquire a mandatory legislation or regulations. This paper thereby reveals how efficiently the electronic gadgets can be utilized by disabled persons. In future this can be further enhanced by more graphical options and screens in biometric field in terms of speech recognition detected in lightening speed.

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