The International Journal Of Engineering And Science (IJES)
|| Volume || 3 || Issue || 6 || Pages || 27-31 || 2014 ||
ISSN (e): 2319 – 1813 ISSN (p): 2319 – 1805

RF-ID Based Touch Screen Museum Guide System

[1,] Mr.L.R.Patil, [2,] Mr.H.T.Ingale, [3,] Dr.K.P.Rane
[1, 2, 3,] *Department of Electronics & Telecommunication, Godavari College of Engineering, Jalgaon.*
[4,] Mrs.S.K.Chaudhari
[4,] *SSGB College of Engineering & Technology, Bhusawal.*

----------**ABSTRACT**----------
Tourism plays an important role in the economies of many countries. Tourism can secure employment, foreign exchange earnings, investment and regional development. The goal of the system is to provide correct and easy information to the tourist, to make tourism attractive. Visitors are not always able to be given a guided tour at the museums. However, the learning outcome is related to the skills of the guides that explain the things. In order to provide a self-learning environment, interactive device were designed to provide relevant content, when the visitors are browsing by themselves. The objective was to replace the manual guide. Guides use various pedagogical strategies to make the contents interesting. In order to provide personalized learning, (Radio Frequency Identification Device (RFID) technology is used to associate each user with a unique identification. RFID comprises a reader and a tag. The reader receives the identity of an object from the embedded tag wirelessly using radio waves and then compares it with the corresponding identification stored in the database. When a match is found, detailed information is retrieved and user can able to listen the audio clip of the painting, with these our project is providing images related to that painting.. So the user can take a audio as well as image tour of the museum. This seminar focuses on to make a user friendly device for making easy guide line to tourist with combination of audio and image facility.

Keywords *- Museum Guide System, RFID, Reader, Tag, Touch Screen.*

Date of Submission: 26 May 2014 Date of Publication: 10 June 2014

I. INTRODUCTION

One purpose of museums and galleries is to improve the awareness for a particular subject, provide inspiration and general education. Many such facilities do not sufficiently manage to captivate the audience and visitors consequently do not return. One problem is that there may be a lack of trained guides. Guides are sometimes only offered at certain times and only for groups of visitors. A good guide can make all the difference between a mediocre and a memorable museum experience as a talented guide is able to captivate the audience with their stories. One solution often adopted is to let visitors borrow devices including headsets, handhold controllers and audio playback devices. Pre-recorded records are then used to present exhibition-related introductions to the visitors. However, static audio is not interactive and may be too uninteresting for very young visitors with a short concentration span. Another problem is that some visiting routes may be blocked by visitors grouped around other popular exhibitions. Although most people are aware of the importance of science, students often find science boring and uninteresting as traditional textbooks only provide static information. Tourists may expect inspiration and fun instead of pure knowledge when visiting art museums. In order to guarantee that most tourists can enjoy the stories behind artwork some tools are needed to help them browse the background and provide related information of exhibitions when they want to gain a deeper understanding about specific exhibitions. In order to make operations of the system as friendly as possible, RFID technology is exploited to bridge artefacts, their background stories and related artefacts. Moreover, the handheld device approach is especially suitable for space constrained venues where there is no space for information kiosks in the vicinity of the artefacts. The small assistants are portable and the approach scales unlike information kiosks that can only be used by one person at the time. In our implementation, PDA were used as the handheld platform [1].

II. EXISTING SYSTEM

It's a voice enabled device that speaks out as the tourist is travelling from places to places (museum). When the tourist is standing near major landmarks, it will detect the RFID tag and will play an audio clip relevant to that location. This is achieved by placing a RFID receiver with the tourist (palm device). as soon as the palm device comes in the vicinity id the RF tag the microcontroller receives the RF tag unique id from the receiver and matches it with its own data base. If match occurs the microcontroller will play an audio clip relevant to that statue/painting. Audio files are tagged with location coordinates and a tolerance range. In a particular location, the file that matches the tolerance range is played, which shown in Fig. 1 [2].

Another recent and sophisticated one is the Discovery Point, which is a small remote control like device that allows users to hear short stories related to the work of art; it is in use at the Carnegie Museum of Art in Pittsburgh (Berkovich et al., 2003). The Discovery Point prototype is a headset-less audio system consisting of the physical device that the visitor holds and special speakers which deliver pinpointed audio that can only be heard near the work of art [3].

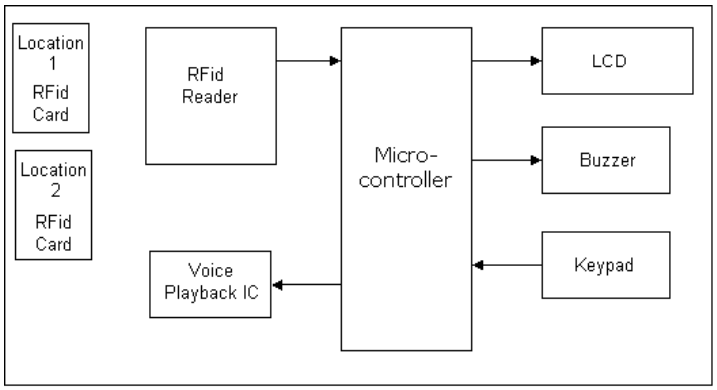

Fig. 1 RFID Based Audio Museum Guide System for Tourists [2].

III. PROPOSED SOLUTION

This technology consisting of three important key elements: RFID Tag, RFID Reader and ATxmega128A1 device. Fig. 2 shows an system architecture of RFID based touch screen museum guide system, in which user has to read the the tag of any area with the help of provided device.after reading the tag, tag no will be matched with number's which will be stored in database of device.if match foun then device will play the slide show of images with an audio clip.

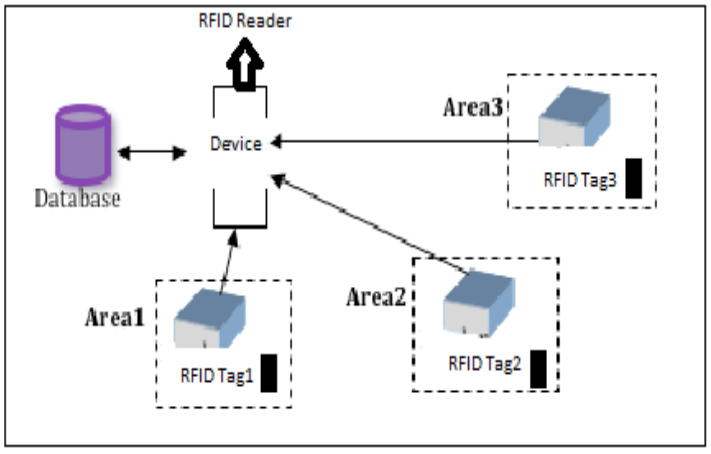

Fig. 2 System Architecture

3.1 Program Flow

After initializing of system and memory card RFID card will be swapped, if tag is not authenticate then it will display the error message or if card is authenticate then it will start slide show with a relevent audio clip.Detail flow of software will be shown in Fig.3.

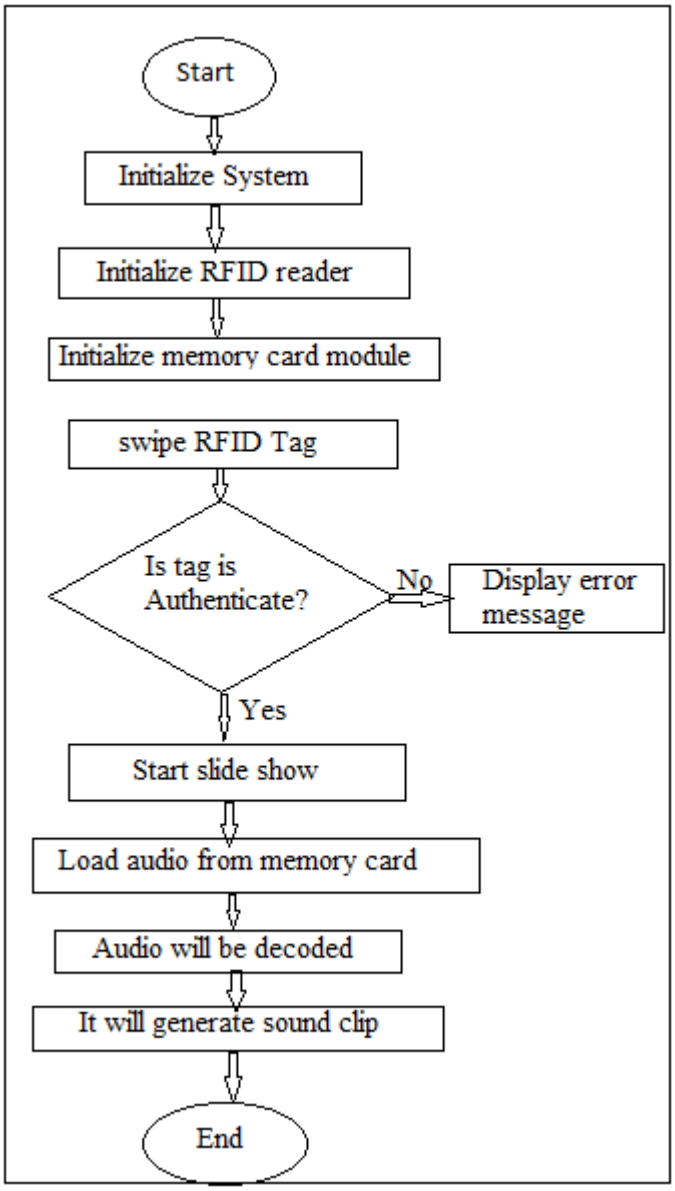

Fig. 3.Program Flow

3.2 RFID Topology

An RFID system consists of a tag made up of a microchip with an antenna, and an interrogator or reader with an antenna. The reader sends out electromagnetic waves. The tag antenna is tuned to receive these waves. A passive RFID tag draws power from the field created by the reader and uses it to power the microchip's circuits. The chip then modulates the waves that the tag sends back to the reader, which converts the new waves into digital data. In its minimalist configuration the micro-topology requires just four sub-systems, as follows [4]

I. Tag.

II. Reader.

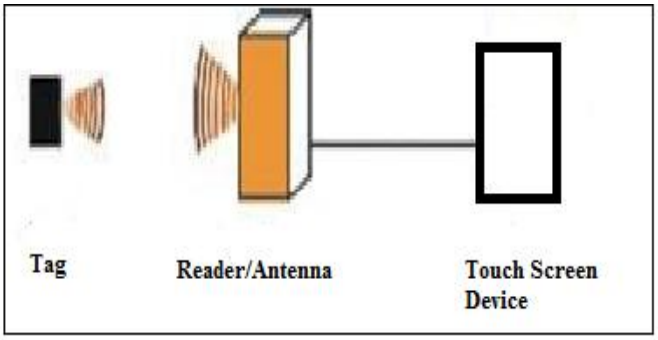

Fig. 4 Basic RFID Interface

Basic RFID system consists of three components

I) Tags

The basic RFID building blocks are miniature electronic devices known as Tags which talk to Readers. The RFID tags, also known as transponder, are usually small pieces of material, typically comprising three components: an antenna, a microchip unit containing memory storage an encapsulating material. Tag are embedded or attached to an item. The Tag has memory which stores information as either read only, write once or unlimited read/write. Tags typically range in size from a postage stamp to a book, depending on read distance and features. RFID tags come in a wide variety of shapes and sizes [4].

II) Reader

The Reader is able to talk to the Tag using radio waves over the air to send or receive information. The distance between the Tag and Reader for the radio waves to be strong enough for the devices to talk with each other is an important specification in building a reliable RFID system. Once you have reliable radio communications between the Tag and the Reader the system may take action based on results of their communication. RFID may send information downstream to your legacy systems or update digital information stored on the Tag. This wide range of options and the real time capability of RFID give it exciting new capabilities, distinct advantages and specific costs to build its infrastructure. RFID systems are also distinguished by their frequency ranges. Low-frequency (30 KHz to500 KHz) systems have short reading ranges and lower system costs [4].

3.3 Hardware Interface

There so many types of micro controller families. Those are 8051, AVR microcontroller, PIC microcontroller, ARM.

ATxmega128A1 microcontroller is selected because it is a 8-bit architecture, 128 KB of Flash memory, 8 KB of SRAM memory, 2048 Bytes of EEPROM, 78 I/O pins, 32kHz RTC; UART, SPI, ADC, DAC etc. [5].

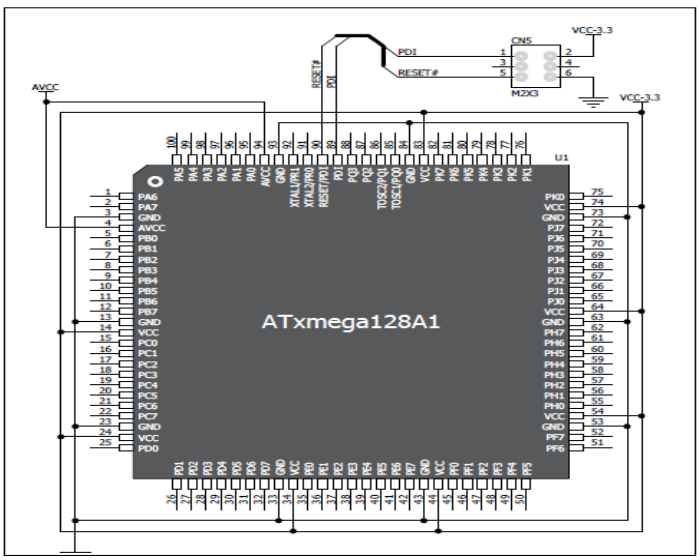

Fig. 5 ATxmega128A1 Microcontroller

3.3.1 Power Supply

Power supply can be applied to the board using MINI-B USB cable provided with the board. On-board voltage regulators provide the appropriate voltage levels to each component on the board. Power LED (GREEN) will indicate the presence of power supply[5].

Another way to power the board using Li-polymer battery, via on-board battery connector. On-board battery charger circuit enables to charge the battery over USB connection. LED diode (RED) will indicate when battery is charging. Charging current is ~250Ma and charging voltage is 4.2V DC[5].

IV. EXPERIMENTAL RESULT

The system is successfully implemented which gives the results of displaying the images and plays audio clip. After swapping the tag, our touch screen display starts a slide show as per the images stored in the memory card, and with each image it will play an audio clip.

Slide show image 1 With audio clip | Slide show Image 2 with audio clip | Slide show image 3 with audio clip | Slide show image 4 with audio clip

V. CONCLUSION

In this paper, we described our work for the project RFID based touch screen museum guide system. This project aims to developing a personalization platform for museums based on RFID technology. Museums invest human and financial resources to improve the learning experience that they offer to their visitors. Especially groups of visitors, like school students, tend to carefully observe only a small fraction of the exhibits, as younger visitors usually move fast from one exhibit to another. Therefore, by rushing among the exhibits, visitors cannot fully explore the provided learning experience that the museum has designed for them.

By using RFID technology, this project allows visitor to take a image and audio tour by swapping the tag. So that, within a limited time user can get the appropriate and correct information about the object.

REFERENCES

[1] Yo-Ping Huang, Yueh-Tsun Chang and Frode Eika Sandnes, Experiences with RFID-based interactive learning in museums , *international journal autonomous and Adaptive Communications Systems*, Vol.X.No, xxxx.
[2] http://www.projectsof8051.com/projects/44-rfid-based-museum-guide-for-tourists.html (23/05/2014, 12.10pm).
[3] Tsvi Kuflik, Adriano Albertini, Paolo Busettaa Cesare Rocchi, Oliviero Stock, and Massimo Zancanaro, An Agent-Based Architecture for Museum Visitor's Guide System, *ITC-irst, Instituto per la Ricerca Scientifica e Technologica, Provo, Trento, Italy.*
[4] http://www.scribd.com/doc/73072412/RFID-Based Museum-Guide-for-Tourists (23/05/2014, 2.25pm).
[5] *Mikromedia_xmega_manual_v111b*
[6] Rasoul Karimi, Alexandros Nanopoulos, Lars Schmidt-Thieme, RFID-Enhanced Museum for Interactive Experience, *University of Hildesheim, 31141 Hildesheim, Germany.*
[7] Stephen A. Weis MIT CSAIL " RFID (Radio Frequency Identification): Principles and Applications"
[8] Christoph Jechlitschek "A Survey Paper on Radio Frequency IDentification (RFID) Trends"
[9] Dhaval H Kotecha "Automation in Library using RFID Technology" 6th Convention PLANNER - 2008, Nagaland University, Nagaland, November 06-07, 2008 © INFLIBNET Centre, Ahmedabad