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RFID Based Museum Guide for Tourist

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***Abstract*: RFID based museum guide (Electronic hand held device) is designed to replace tourist guides to an extent. It's a voice powered device that speaks out as the tourist is travelling from one monument to another monument (museum).This is achieved by placing a RFID receiver with the tourist (palm device). As soon as the electronic hand held device comes in the local area id the microcontroller receives the RF tag unique id from the receiver and compete it with its own data. If there is similarity occurs the microcontroller will play an audio clip related to that statue/painting. An RFID module basically comprises a tag and a reader. A RFID system comprises of an antenna, a transceiver and a transponder.**

***Keywords:* RFID Reader, Tag, APR voice module (33A3), ATmega16A, Headset etc.**

I. INTRODUCTION

One purpose of museums and galleries is to improve the awareness for a particular subject, provide inspiration and general study. One problem is that some guides may untrain. 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 hold the public with their stories. An answer to a problem is to let visitors borrow devices including headsets, handhold controllers and audio playback devices. Guides are sometimes only offered at certain times and only for groups of visitors. So to overcome this problem one solution is to replace the manual guide & place the RFID enabled palm device. Students who achieve better usually have practical experiences related to the subject or have been exposed to interactive learning tools. In order to make the museum guide experience more dynamic, multimedia content and tests (learning objects) designed by educators who are experts in the specific domains is combined with an interactive learning assistant. 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. [1]

II. LITERATURE SURVEY

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 [2]. In the "S o t t o V o c e: Exploring the Interplay of Conversation and Mobile Audio Spaces" also have designed electronic guidebook, Sotto Voce, has social interaction as a primary design goal. The system enables visitors to share audio information.[3]In the "RFID-Based Guide Gives Museum Visitors More Freedom" by Yo-Ping Huang and Shan-Shan Wang, National Taipei University of Technology, Taiwan Frode Eika Sandnes, Oslo University College, Norway have designed An interactive museum-guide system exploits RFID and handheld computers to let museum visitors better explore exhibition objects.[1]The importance of social interaction to museum visitors is well known [5] We have reported on a previous study in which visitors could hear each other's guidebook audio through open air, using speakers built into the guidebook. [6, 7]

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III. BLOCK DIAGRAM

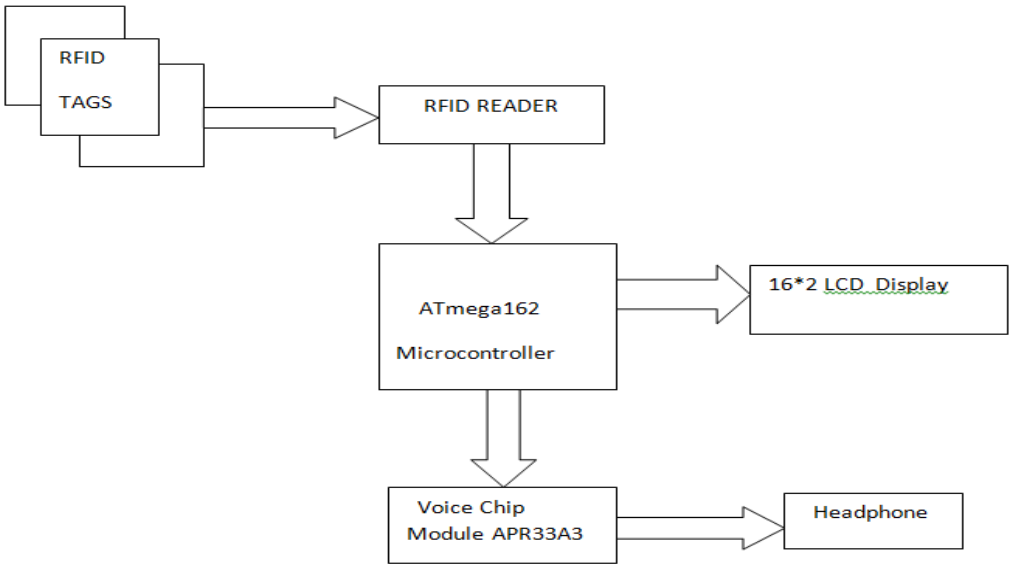

Fig.1 Block Diagram

RFID TAG:

The basic RFID building blocks are miniature electronic devices known as Tags which talk to Readers. The RFID tags, also called as transponder, are usually mini parts of material; particularly consist of three components which are an antenna, a microchip unit containing memory storage an encapsulating material. Tag is attached to an item. The Tag has memory which stores information as read only, write once or unlimited read/write. Tags typically range in size from a small printed label to a book, depending on read distance and features. RFID tags come in a various shapes and sizes. RFID tags are categorized into active and passive. They are fundamentally distinct technologies with substantially different capabilities. Both of the technology use radio frequency energy to communicate between a tag and a reader, we can energize the tag in a different way. Active RFID tags are powered by an internal battery or internal power source continuously power the tag and its RF communication circuitry .While passive RFID tags operate without a separate external power source and obtain operating power generated from the reader. The passive RFID depend on RF energy transferred from the reader to be tag to power the tag. A passive tag is comparatively much lighter than active tags, low cost, and has an unlimited operational lifetime.

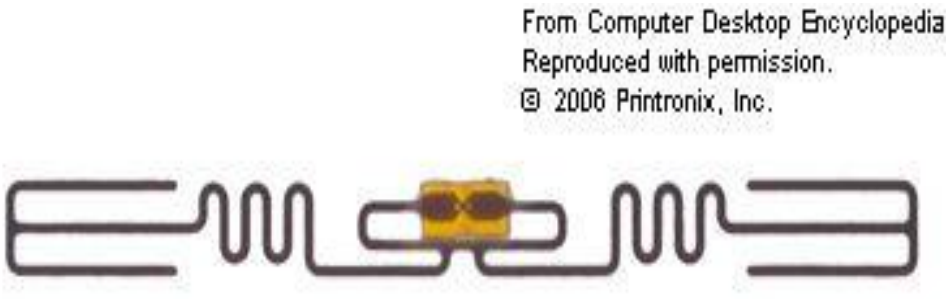

Fig.2: RFID Tag

RFID READER:

The Reader is able to communicate to the Tag using electromagnetic waves over the air to send or receive data. The distance between the Tag and Reader for the electromagnetic waves to be strong enough for the electronic device to talk with each other is a crucial feature in making a compatible RFID system. Once you have faithful RF communications between the Tag (Transponder) and the Reader (Interrogator) the system may take action based on output of their RF

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communication. RFID update digital information stored on the Tag. This huge range of options and the real time capability of RFID give it exciting new capabilities, different merits and particular costs to build its infrastructure.

Fig.3 RFID Reader

ATMEGA 16A:

The ATmega16 is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega16 achieves throughputs approaching 1 MIPS per MHz allowing the system designed to optimize power consumption versus processing speed.

There so many types of micro controller families. Those are 8051, AVR microcontroller, PIC microcontroller, ARM. Atmega16 microcontroller is selected because it is 16 Kbytes of In-System Programmable Flash Program memory with Read-While-Write capabilities, 512 bytes EEPROM, 1 Kbyte SRAM, 32 general purpose I/O lines, 32 general purpose working registers, a JTAG interface for Boundary scan, On-chip Debugging support and programming, three flexible Timer/Counters with compare modes, Internal and External Interrupts, a serial programmable USART, a byte oriented Two-wire Serial Interface, an 8-channel, 10-bit ADC with optional differential input stage with programmable gain (TQFP package only), a programmable Watchdog Timer with Internal Oscillator, an SPI serial port, and six software selectable power saving modes. The Idle mode stops the CPU while allowing the USART, Two-wire interface, A/D Converter, SRAM; Timer/Counters, SPI port, and interrupt system to continue functioning.

VOICE MODULE [APR33A3]:

Today's purchaser exaction the best in audio/voice. They want pure sound wherever they are in whatever format they want to use. APLUS provide the technology to increase a listener's audio/voice experience.

The aPR33A series are enough strong audio processor along with high performance audio analog-to-digital converters (ADCs) and digital-to-analog converters (DACs). The aPR33A series are a fully integrated solution offering high performance and unparalleled integration with analog input, digital processing and analog output functionality. The aPR33A series incorporates all the functionality required to perform demanding audio/voice applications. High quality audio/voice systems with lower bill-of-material costs can be implemented with the aPR33A series because of its integrated analog data converters and full suite of quality-enhancing features such as sample-rate convertor.

Following are the specification of the APR33A3 voice module:

- Operating Voltage Range: 3V ~ 6.5V
- Single Chip, High Quality Audio/Voice Recording & Playback Solution
- No External ICs Required
- Minimum External Components
- User Friendly, Easy to Use Operation
- Programming & Development Systems Not Required

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- 170/ 340/ 680 sec. Voice Recording Length in aPR33A1/aPR33A2/aPR33A3

LCD DISPLAY:

A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. A **16x2 LCD** means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD. LCD is used to display the name of monuments which are placed in the museum.

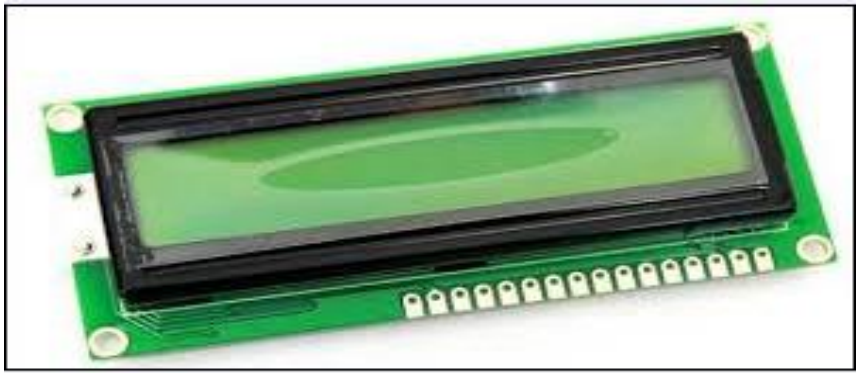

Fig. 4 LCD display

IV. FLOW OF SYSTEM

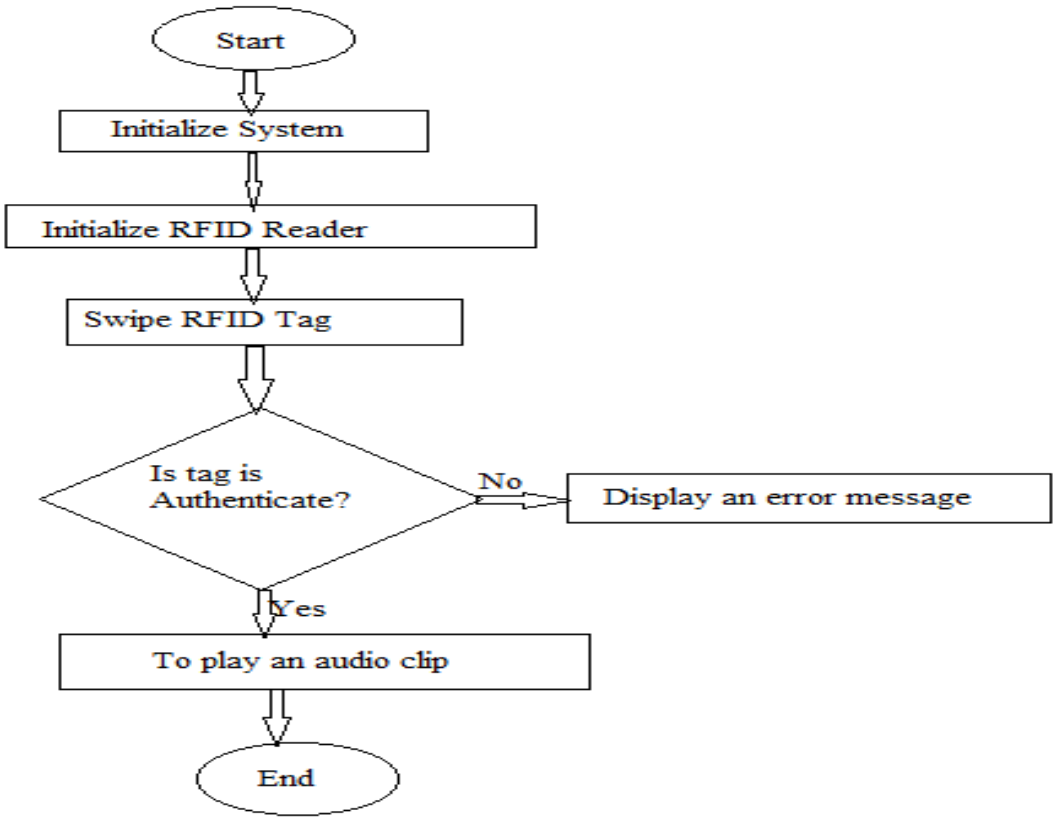

Fig.5 Flowchart

V. CONCLUSION

The project "RFID Based Museum Guide for Tourists" has been successfully completed and tested with Integration of the features of every hardware component for its development. Presence of every block has been reasoned out and placed carefully thus contributing to the best working of the unit. The project has completed using very simple and easily available components making it lightweight and portable. This helps tourists to move in any premises of museum with the help of RFID Technology. The voice chip module is also interfaced for audio playback for the recorded voice messages relevant to particular object. I believe that our step is towards complete automated guidance system for tourists. Finally we can conclude that this project application gives a very good feature and there is huge scope for further research and development for using the same with the help of advanced technology.

REFERENCES

[1] Yo-Ping Huang, Yueh-Tsun Chang and FrodeEikaSandnes, Experiences with RFID-based interactive learning in museums, international journal autonomous and Adaptive Communications Systems, Vol.X.No, xxxx.

[2] 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.

[3] sotto voce :'' Exploring the Interplay of Conversation and Mobile Audio Spaces" by Paul M. Aoki, Rebecca E. Grinter, Amy Hurst,Margaret H. Szymanski, James D.Thornton, and Allison Woodruf.

[4] Bederson, B.B., "Audio Augmented Reality: A Prototype Automated Tour Guide," Conf. Companion, CHI 1995, Denver, CO, May 1995, 210-211.

[5] Hood, M.G., "Staying Away: Why People Choose Not to Visit Museums," Museum News 61, 4 (1983), 50-57.

[6] Woodruff, A. et al., "Electronic Guidebooks and Visitor Attention," Proc. 6th Int'l Cultural Heritage Informatics Meeting, Milan, Italy, Oct. 2001, 623-637.

[7] Woodruff, A. et al., "The Conversational Role of Electronic Guidebooks," Proc. Conf. on Ubiquitous Computing, Atlanta, GA, Sept. 2001, 187-208.

[8] Vom Lehn, D. et al., "Exhibiting Interaction: Conduct and Collaboration in Museums and Galleries," Symbolic Interaction 24, 2 (2001), 189-216.

[9] Martin, D., "Audio Guides," Museum Practice 5, 1 (2000), 71-81.