The Smart Electronic Guide for Museums
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Abstract— Museums are our cultural heritage. They preserve our history, our culture and tell us about our today’s modern technology and innovative methods of attracting people to museums, foremost sign of history of each country, different methods arise to guide people inside the museums in a best way possible to facilitate information exchange between individuals and museum guides. We designed the smart electronic guide for museum using AVR microcontroller and RFID technology which has the capability of providing a vocal information to the visitors of museum regarding each object in the museum. The advantage of this device is Low cost, easy to access, promotable program, which is user-friendly in providing information. The purpose of this project paper is to provide information in very easy way to the visitors of museum so that it is convenient to understand the history of specific object to the visitor [1].

Key words: AVR Micro-controller, RFID Technology, APR 33A3 IC, C Programming and Museum User Guide

I. INTRODUCTION
Museums are our cultural heritage. They preserve our history, our culture and tell us about our today’s modern technology and innovative methods of attracting people to museums, foremost sign of history of each country, different methods arise to guide people inside the museums in a best way possible to facilitate information exchange between individuals and museum guides. So Museum guide should know everything about that Museum. But there are some limitations on human resources, such as language problem, lack of knowledge etc. This causes lots of difficulties in organizing qualified people among the whole museum. So we thought to design an electronic device, using AVR micro-controller and RFID Technology, which can be used to provide individuals in a museum with vocal data regarding each object in the museum simply by entering a code designated to that object. The paper tells about the Museum using AVR controller. This device is very simple and easy to handle.

II. HARDWARE
All the parts employed to fabricate this electronic museum guide, are presented in this section. In our design, playing bit rate is 16Kbyte/sec due to the mp3 format.

A. AVR ATmega16A
The AVR ATmega16A is a low power 8-bit microcontroller [2],16Kbytes of In-System programmable flash program memory,512 bytes EEPROM,1Kbytes SRAM, Real time counter(RTC) with Separate oscillator, 4Flexible Timer/Counter, 32 programmable I/O lines. For our design, 16MHz frequency was used via a 16MHz external crystal oscillator.

B. APR 33A3:
APR33A3 is single chip, high quality audio/voice recording & playback IC, 680 sec. voice recording length, no battery backup is required, built in audio recording microphone amplifier [3].

We already recorded the audio information of each object in three languages by using microphone.

C. RFID module:
RFID provides an ability to identify, locate. Sense the object using radio waves. In this technology a unique ID is stored to identify object & other related information, on microchip of Silicon that is attached to an antenna which in turn is attached to RFID reader. Reader converts the radio waves into digital information which is given to AVR microcontroller via MAX232. Radio-frequency identification (RFID) is a wireless non-contact technology that uses radio-frequency electromagnetic waves to transfer data from a tag attached to an object. This capability can be added to the mobile devices by new ICs; which can act as a reader with a small loop antenna. In this way instead of entering the digital code from the touch screen, the data will automatically be loaded when the visitor enters the specific zone of each object [4].

D. Block Diagram:
At first tourist /user start the device using keypad .There are buttons registered for each language and user selects language of his choice through keypad. The language options are assigned to the I/O port pins of AVR .When user selects language that language pin is enabled and selected language is displayed on LCD. Microcontroller via MAX232 logic level convertor.

Fig. 1: Block diagram
When user moves in front of particular object having RFID tag. RFID reader will scan code of that object. This code is transferred to AVR. It converts CMOS voltage level to TTL voltage level and vice versa .This scanned
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location is displayed on LCD display. AVR microcontroller plays the sound files in APR33A3 of scanned object. Vocal information o/p is given through headphone. Battery used is of 4.5V and 1A.

III. SOFTWARE
There are two methods for programming AVR ATmega16A microcontroller: C, Assembly. Regarding to programming complexity, using assembly is impossible. Hence we preferred C Programming. Flow chart of the software programming is shown in Fig. 1.

At start device is in sleep mode. When user presses power on button device will turn on otherwise it will go to sleep mode. The user has to select language using keypad. If user selects English language, this language is continued throughout the program.

After selection of language when user enters in front of particular object area RFID Reader scans that code from object tag and then controller checks if the sound files exist or not. If file exists then that file is played. In case interrupt occurs for e.g. pause, replay then timer is reset. If there is no any interrupt then plays till its end. Same process is repeated when user goes in front of next object.

In case RFID fails user can use the keypad to enter code assigned for each object. If this code is incorrect then user has to reenter the correct code.

![Flowchart of the Programming](image)

Fig. 2: Flowchart of the Programming

IV. CONCLUSION
Smart Electronic guide for museum is capable of providing audio information about each object in museum. This device is RFID based so it makes visitors work more easily. Smart Electronic guide for museum will provide information in multi-language, so that every visitor will get total informational knowledge of each and every object in museum and will enjoy his visit in museum.

The main goal of our project is to achieve high quality standard of living in human community and in society. Smart Electronic guide for museum device is user friendly, low cost, easy access, and device can be handled by all range of ages easily. Smart Electronic guide for museum system developed aspect evolution in modern lifestyle. Finally, our project helpful to improve standard of living in human society and in modern human community.

V. RESULT
When our project was completed, all the circuitry works properly. Experiment was performed on three types of object. When the reader is in front of object the device gives the audio information about that object in selected language.

We record information using APR33A3 which has 1 minute record and playback capacity for each message. Thus we store 4 objects information each in three languages- Hindi, English and Marathi. For further IC of greater memory. To avoid noise and disturbance from neighboring visitor as well as for clear audio we have use headphones.

A. Some snaps of our project:

VI. FUTURE SCOPE
(1) Our project can be further advanced using visual interface to give videos, maps and information in museum.
(2) Our device can be advanced as city guide for tourist using GPS as localization techniques and GIS support for generating maps of the city.
(3) Museum guide can further include games to make information more interactive for tourist and will increase their interest.
(4) Our project can be advanced further to give a pictorial, graphical, 3D information to the visitors.
(5) Also we can use memory stick for storage of information instead of IC’s.
REFERENCES


[2] ATMEL, 8-bit Atmel Microcontroller with bytes In-system programmable flash, ATmega 16 a datasheet.


[4] Mohammed Sarosh Umar, Juned Ahmad Ansari and Mohammad Qasim Rafiq. ”Automated Retail Store Based on RFID”.