

RFID based Intelligent Guide for Tourist

¹Dr. PHV Sesha Talpa Sai, ²Dr. Amiya Bhaumik, ³Julakanti Nishanth Reddy, ⁴Vineeth PA,
⁵Vinayaka Kambli, ⁶Dr. M. Sucharitha

^{1,6} Professor, Lincoln Global Academy, Kolkata, India

² Professor, Lincoln University College, Petaling Jaya, Malaysia

^{3,4,5} UG Student, Lincoln University College, Petaling Jaya, Malaysia

Abstract— Tourist guides are available at specific times alone and that too for few gangs of visitors. A great guide exhibit remarkable distinction among an average and memorable museum experience. A skilled guide can easily fascinate the audience with their narration. One issue is that there might be an absence of qualified guides. RFID supported tour assistant is expected to be an alternative for tourist guides to a certain degree. RFID based intelligent traveller guide is an electronic hand-held device, that helps to switch traveller from one place to another. This can be a voice enabled system in which the voice board speaks out when the person travels from one place to a different place and also gives relevant data about this place. Once the traveller is standing close to significant tourist spots, it notices RFID tag and can tune associate degree audio file pertinent to respective spot. It can be accomplished via putting a RFID receiver along traveler's palm device. The data about the objects/places are played whenever the tourist reaches the particular place. In this proposed method, the data's are stored both in audio and video format so that the tourist can understand the details about the object/places easily.

Keywords— RFID reader, Tags, Voice Board, Microcontroller

I. INTRODUCTION

Travelling for pleasure is tourism and it tends to be domestic or worldwide. Recent days, the tourism plays significant role in booming the economy of certain countries. A tourist guide offers support and data about cultural, historical and contemporary legacy understanding to individuals of planned tours regarding educational foundations, religious, historical sites, exhibition halls and at scenes of other significant intrigue. The services of tourist guide for the most part will improve our focus towards the site. However some burdens that ought to be mulled over priorly for employing a guide.

One issue is that there might be an absence of well trained guides. One remedy regularly embraced is to make visitors hire gadgets like headsets, handheld controllers and sound playback contraptions. Pre-recorded records are then utilized to present show related acquaintances with the visiting people. Be that as it may, static audio isn't that bilateral and unattractive for extremely youthful sightseer with less focus on site.

One more issue is some journeying paths might have hindered by sightseers organized around different famous shows. This proposed RFID based intelligent tourist guide will remove this problem by using the prerecorded data's stored about the particular objects in this portable palm device. The data can be saved both in audio and video format. This helps the tourist to understand the information about the object/places easily.

In this work, a framework which confers about the vital innovations about exhibition guide system framework dependent on RFID and handheld gadget was introduced. The remainder of this paper has been sorted out in following prospect. Segment 2 surveys the relevant work. Segment 3 portrays prerequisite of framework. Section 4 depicts the construct of the Museum Guide System. Segment 5 describes exploratory outcomes. Section 6 finishes up this paper and illustrates the future work.

II. LITERATURE REVIEW

In the existing system guide is responsible for guiding and for the security of the tourist while his travel. Tour Guides in general have their own plans, and any guide who is restricted to a similar site will discover alternate routes and commission openings that will discover hard to stand up to. If a tourist is of independent type, then the tourist will probably regret for loss of some element of discovery. It is better to find things by our own and to feel that we have done something that others have not done.

The extension of versatile figuring gadgets and local-area wireless networks has empowered a creating eagerness in location-aware systems and administrations. RADAR, a radio-frequency (RF) based framework for finding, following clients inside structures is presented. RADAR works by recording and preparing signal quality data at different base stations arranged to give covering inclusion in the field of interest. It consolidates exact estimations with signal proliferation demonstrating to recognize client area and in this way empower local-aware services and applications. The exploratory outcomes show the capacity of RADAR to gauge client area with a significant level of accuracy [1].

The Guide framework gives one of a kind understanding about the difficulties confronted by developers of location based applications. Concentrating our scheme on a tour-guide system for end users has favored us increase practical exposure with process of building one class of location based applications. To perform adequately, Guide depends not on innovation as well as on help from users. This association offers particular advantages, both as far as exactness and in cultivating a connection among end user and the Guide system. The objective is for making a more captivating and convincing experience than might some way or another conceivable on the off chance that we depended on technology alone [2].

Information technology's quick development offers an incredible chance to improve individuals' education and comprehension of their social legacy. It can do this from multiple points of view, from encouraging advanced obtaining of information from pictures and relics to multimedia content introductions. [3]

At present, individuals get information about social and arts data through the support of personal computer and other comparable platforms, which includes independent projects, CD-ROMs, Web locales, and data booths. A couple of research extends in omnipresent and context aware computing has focused on PC support for exhibition hall and tour guides. Regardless, little has been circulated about how users survey and recognize ubicomp systems in museum and park conditions. The user viewpoint is tended to introducing results from tests planned for observing in what way pervasive computing could bolster a museum-like experience. Primary accentuation is on how ubicomp systems will influence genuine visitors in real environments [4].

RFID technology [5] is utilized to get the show data and furthermore utilizes the infrared transmission technology to consequently get the situation of the visitor. Following methods referenced in guests need initiate the gadget with the objective that it understands which show. The exhibit data display can be altered consequently as per the spot of the visitor. They are totally depending on PDA. Notwithstanding, it is conceivable that visitors are not intrigued by show close to them. Tablet PC [6] with IEEE 802.11 wireless networking capability and intelligent searching model is utilized. Tablet PC has adequate memory limit like desktop computer, however it isn't as enough as handheld devices like personal digital assistants. The 'Hands-Free Interaction Guide System' is customized framework dependent on RFID technology [7] and suggestion mining strategy. Educators have supported the framework.

Traditional suggestion frameworks does the information mining on web get to logs, discover user's access patterns, and refine the data in the interest of a legitimate concern for the user at the server side. The system gathers and mines the private data of user at the customer side, find, store and refreshes private Dynamic User Profile (DUP) at the customer side. The structure brings supported message from the substance server according to DUP. The preliminary shows that the structure can utilize DUP to recognize the user's potential tendencies and pass on the more favored messages, especially the notices, to people who are intrigued [8]. Wi-Fi controlled robotic rover was implemented using Raspberry-pi and Arduino. Two motors were used and Raspberry-pi was powered by iPhone, iPad or laptop. It sends data to Arduino and gives instructions [9].

III. REQUIREMENTS

The proposed system comprise of a Microcontroller(AT89C52), Power supply, Display, RFID Reader and Voice Board (APR9600).The proposed system is a voice empowered device which stands up as the tourist is going from one spot to other. A RFID [10] module essentially comprises of two sections, in particular, a tag and a reader. A RFID [11] system comprises of an antenna, a transceiver and a transponder (RF tag).The radio recurrence is scrutinized by handset and the information is moved to a gadget for additional preparing. The data to be transmitted is taken care of in the RF tag or transponder. The transponder contains a chip and n antenna mounted on a substrate. The chip transmits the significant data through reception antenna. The reception device moreover gets the electromagnetic waves sent by the RFID per user.

A. Microcontroller

The AT89C52 is a low-power, prevalent CMOS 8-bit microcomputer with 8K bytes of Flash programmable and erasable read only memory (PEROM).The gadget is made using Atmel's high-thickness non volatile memory technology and is acceptable with the business standard 80C51 and 80C52 guidance set and pin out. The on-chip Flash permits the program memory to be reinvented in-framework or by a regular non-unpredictable memory programmer. By merging a flexible 8-piece CPU with Flash on a solid chip, the Atmel AT89C52 is an extraordinary microcomputer where it gives a profoundly adaptable and financially convincing outcome for a few implanted control applications.

B. RFID Reader and Tags

A RFID reader is a device used to gather data from the RFID tag which is utilized to trail the objects. The data is moved from tag to the reader with the assistance of radio waves. The technology

of RFID is comparative in the theory to barcodes. The RFID tag doesn't need to be scanned straightforwardly nor does it require line of sight to a reader. This technology permits a many items to be scanned rapidly and empowers the distinguishing proof of a specific object in a quicker manner, in any event, when it is encircled by different objects.

C. Reader/Tag Range

The Reader/Tag Range has the salient features such as the antenna of tag/reader is designed which is closely coupled. Tag can limit the range with a small antenna that requires more power and reader can limit range with a small antenna that issues less power requiring tag to be closer.

D. Voice Board

Voice module APR9600 is utilized here. It is a solitary chip which has voice recording and playback resolution. This voice board is easy to understand. It has non-volatile flash memory technology, no battery reinforcement is required. The sampling rate is 4-8 KHz. Audio output assists with driving a speaker or audio out for public address system. It can record voice with the assistance of on-board microphone or by means of any audio input.

IV. PROPOSED SYSTEM

RFID based Intelligent Tourist Guide is an electronic hand held device which is carried along with the tourist and the RFID tags will be placed in various tourist locations. The designed intelligent system consists of an RFID tag and a receiver. The RFID receiver is provided to the tourist by the concerned authority and RFID tag will be placed in each important location such as a statue, painting so on. RFID tag detects and plays an audio clip giving information relevant to that location.

At the point when the tourist is taking off beginning with one spot then onto the following, the palm gadget comes in the vicinity ID of the RF tag, the microcontroller gets the RF label ID from the receiver and matches it with its own information base. In case match happens the microcontroller will play a sound clasp appropriate to that area. Sound records are labeled with area arranged and a strength expanded. In a particular area, the document that facilitates the flexibility run is played. Here low frequency, 125 kHz RFID tags has been utilized. These labels work inside an extent of 10 cm. Right when a RFID tag comes in this range, the peruser remembers it and transfers an exceptional code of the tag successively. This sequential code, including 12 bytes, is acknowledged by the microcontroller. The data identified with a specific object is shown on LCD.

V. EXPERIMENTAL SET UP AND RESULTS

In this work, museum is considered as a tourist place. When power supply is given to the system the LCD will display the title as INTELLIGENT GUIDE FOR TOURISTS. The tag placed in each location will be detected by the reader. There are 3 tags provided in our case. When first tag is detected, the message "COLLECT TICKET" is displayed. After that second tag is detected, the message "NAPIER MUSEUM" is displayed. Once the third tag is detected, the message "ART GALLERY" is displayed. It was shown in Fig.1.

When the power supply is given, INTELLIGENT TOURIST GUIDE is displayed on the LCD and is shown in Fig. 2. When first tag is shown to the reader it will detect, there by showing the message as 'COLLECT TICKET' (Fig.3). When second tag is shown to the reader, it is detected and

the message is displayed as “NAPIERMUSEUM” (Fig.4). When third tag is detected by the reader, the message “ART GALLERY” is displayed. (Fig.5)

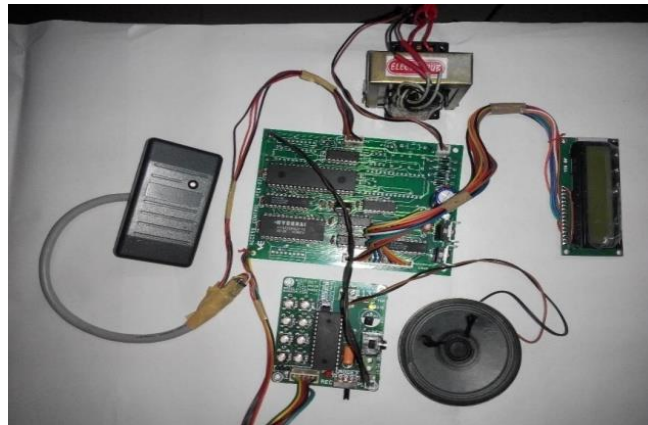


Fig.1 RFID based Intelligent Guide

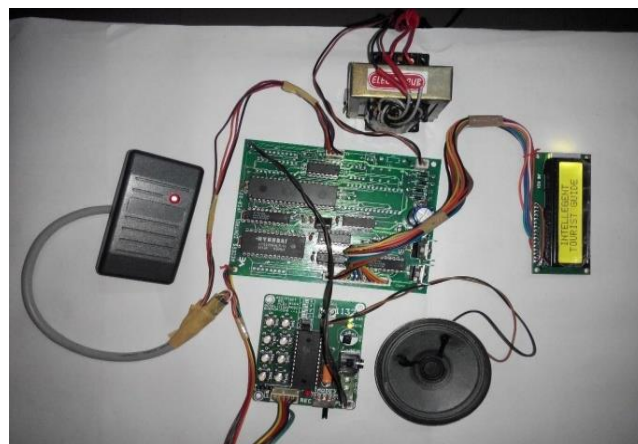


Fig. 2 Title display

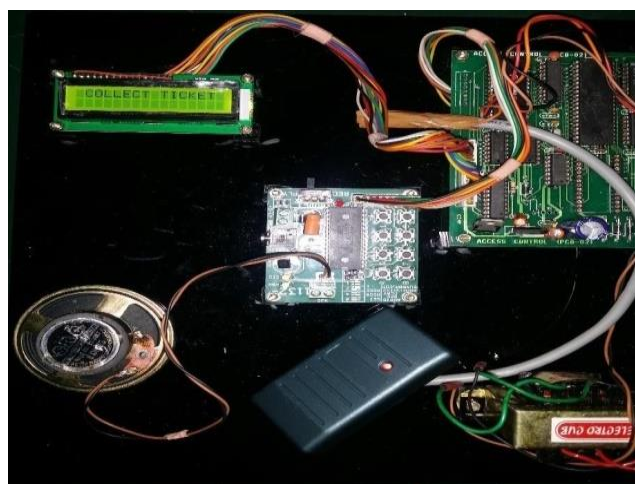


Fig.3. Collect ticket display

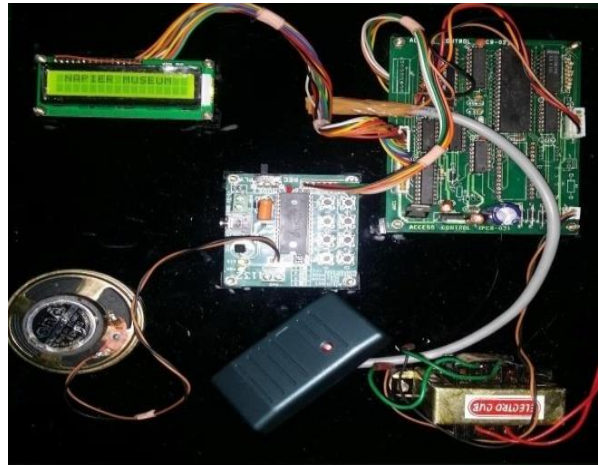


Fig.4 Name of the museum

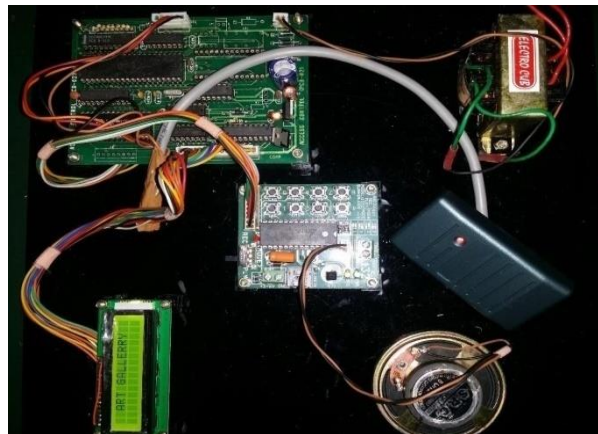


Fig .5 Display of Art Gallery

VI. CONCLUSION

In our proposed method, RFID based intelligent system is used which is an electronic hand held device. The device is carried by the tourist and the RFID tags will be placed in various tourist locations. The voice board of the system helps the tourist to move from one place to another and also gives relevant information about the particular place. This system protects the tourist from terrorist attack and is able to track the location if there is any chance of missing cases in the tourist spot.

So as to give greater portability, the framework has been moved to the mobile phone stage with quick response (QR) code utilizing web support. Visiting people can download explained contents from the web by deciphering the area that is encoded in the QR code picture utilizing a pre-introduced QR code decoder in various mobile phones. In the future, we use the accumulated data from the visitor's perusing history to give constant online intuitive stage for sightseer with comparable zeal.

REFERENCES

- [1] Paramvir Bahl and Venkata N. Padmanabhan, "RADAR: An In Building RF-based User Location and Tracking System", Proceedings of the IEEE Computer and Communications Societies, vol.2, pp.775–784, 2000.
- [2] Nigel Davies, Keith Cheverst, Keith Mitchel and Alon Efrat, "Determining location in a context-sensitive tour guide", IEEE Computer, vol. 34, pp.35–41, 2001.

- [3] J. W. V. Aalst, G. V. D. Mast and T. T. Carey, “ An interactive multimedia tutorial for user interface design”, *Computers Education*, vol.4,pp.227-233, 1995.
- [4] Francesco Bellotti, Riccardo Berta, Alessandro de Gloria, and Massimiliano Margarone“ User testing a hypermedia tour guide”, *IEEE Pervasive Computing*, Vol. 1,pp.33–41,2002.
- [5] Li-Der Chou, Chia-Hsieh Wu, Shih-Pang Ho, ChenChow Lee, Jui-Ming Chen, “Requirement Analysis and Implementation of Palm-Based Multimedia Museum Guide Systems”, *AINA*,vol.1,pp.352-357,2004.
- [6] Yo-Ping Huang, Wei-Po Chuang, "The design of mobile network-based guide system and personalized service model", *National Computer Symposium*, pp. 168-174, 2003.
- [7] M.Dernt and K.A.Hummel, “Modeling context-aware e-learning Scenarios”, *IEEE International Conference on Pervasive Computing and Communications*, pp.337-342, 2005.
- [8] Ting Chen, Wei-Li Han, Hai-Dong Wang, Yi-Xun Zhou, Bin Xu, Bin-Yu Zang, “Content recommendation system based on private dynamic user profile”, *International Conference on Machine Learning and Cybernetics*, Vol. 4, pp.2112-2118,2007.
- [9] P H V Sessa Talpa Sai, Amiya Bhaumik, Fahad Kuniyil, Midlaj KH, Vijeesh Cholayil, “Design and Implementation of Wifi Controlled Robotic Rover based on Raspberrypi and Arduino”, *Test Engineering & Management*, vol.83, Issue May-June , pp.16627-30, 2020.
- [10] Dong Liu, Minto Li, Zhifeng Yao, “A design of self service speech explaining system based on RFID”, *IEEE Conference of Mechanical and Electronics Engineering*,2012.
- [11] XiuqingChen , Hong Zhu, DeqinGeng, Wei Liu, Rui Yang, and Shoudao Li, “Merging RFID and Blockchain Technologies to Accelerate Big Data Medical Research Based on Physiological Signals”, *Journal of Healthcare Engineering* , pp.1-17,Volume 2020.