Automatic Bus card Checker

M.Raja[#1], Sivabarathi[#2], Sowndaria[#3], Suriya prabha[#4], Vishanth[#5]

#1Assistant professor, #2,#3,#4,#5 Department of Electronics and Instrumentation Engineering
Kongu Engineering College, Perundurai, Erode, Tamilnadu, India.

Abstract

The bus card checking for all the students in all the college buses is necessary. Till now, it is done manually by the transport officers. As it takes more time and complexity, our main objective is to automate this bus card checking process using the barcode in a student's identity card. The barcode is registered at the time of fee payment itself. The barcode reader is given as input to the controller. Then the input data is compared with the registered data to check the authorization. If the input data is already registered, then count - one will increase. The ultrasonic sensors are used to count the number of students entering the bus. The necessity of two ultrasonic sensors is to avoid counting the person who enters and leaves the bus immediately. Whenever the ultrasonic sensors detect the entry of a person, the count - two will increase. Then these two count values are compared. If there is any mismatch in that, there will be a display as access denied in LCD. This LCD is used to intimate the bus driver. The GSM is used to intimate the transport officers.

Keywords: Barcode reader, registered data, authorized or unauthorized entry, count, ID card

I. INTRODUCTION

The bus card is provided for all those students using the college bus. The students possessing the bus card are only allowed to use the college bus facility. The bus card is provided for the students only after paying the bus fee. It is necessary to check the bus card for all the students traveling on all the buses. At present, this process is inspected manually by the transport officers. It is necessary to distribute the bus card for each student traveling on the college bus. In the bus card, the details like name, roll no, branch, stage, bus number which they travel regularly are given. These details are used to know the information about the stop and the bus number. The amount and the valid date details are also on the bus card itself. The amount differs for every stage. So the bus fee is different for all the students based on their stage. The distribution of bus cards to all students is such a tedious process. The students without the bus card will be caught during the inspection by the transport officers. The distribution of bus cards to all the students is not a cost-effective one. The automatic bus card checking process is based on the barcode in the ID card of the students. Based on the ID card's barcode, the bus card is unnecessary for all students traveling on the bus.

II. LITERATURE REVIEW

Sainath et al. [11] proposed the automated shopping cart. This shopping cart system comprises two sets of barcode scanners placed at two different checkpoints - the entry and exit end. It helps the user to self - scan the barcode of the purchased products. The customers can make use of a keypad that changes the functionality of the machine from the addition of products to the removal of products and activates the other barcode scanner at the other end so that the wrong entries can be corrected. A wireless smart-device is used to make a note of all the scanned commodities of the particular trolley and is linked with the Supermarket's backend database, which contains details of the products such as cost price, available Stock. The scanned products are automatically billed using the wireless smart device for their purchases, which significantly reduces turnaround time and is transmitted to the Shop's central Billing program. Using this mechanism, the scanning and billing time for every product at the cash counter can be avoided. Users can then make use of the counter to pack and pay. The tray in which the two barcode scanners are fitted with a lock and keys for the people at the billing section. This allows users to take out all their products and place them into carrying bags during the process.

Stefano Celestini [12] proposed that in a manufacturing environment, it is important to make a note of the identity of the operator who is handling a particular machine or entering particular types of data. It is important when there are several shifts and more than one employee does a single machine and/or entering specific data related to machine operations. Here this system identifies individuals entering the environment by scanning an ID badge with the barcode scanner in advance of scanning an error code or the like. The tracking can be established by cross-referencing employee ID with operator shift schedules or the like. These methods could be inaccurate and time-consuming. The system is provided with a hand-held barcode scanner, including a fingerprint reader for reading fingerprint data of the employee, a scanning element for scanning barcode in the ID card, and a processing system for processing the fingerprint data and the barcode data. Since the hand-held barcode scanner includes a fingerprint reader, this system is accurate as the operator must generally be present for their fingerprint data to be input.

YK. Saheed et al. [17] underwent a study that focused on reducing the teacher's effort on paperwork and

time spent on student's attendance. The proposed system of attendance management is implemented using a barcode scanner. Student's records are entered into the system and attached to the barcode. The code is uniquely attached to each student's details for easy identification. In this process, students have to enter into the class only after signing in electronically with an ID card at the beginning of each class. Each student has their ID card for the class attendance signing system. Using this system, students must carry their student ID card as it is compulsory for attendance marking. The computer that implements this system uses a barcode reader. Students can mark their attendance by scanning their card at the barcode reader, which automatically records the attendance information in the server. The reader communicates with the card, thereby acting as the intermediary before sending it to the server. The barcode reader reads the barcode on the ID card and records the data in the server. The data can be processed immediately in an automated way. At the end of the semester, lecturers can get the student's attendance percentage more efficiently and view the standard attendance report.

Quanbin Chen et al. [6] used a moving object counting system that is intended to be a smart system capable of recording information on how many objects, either pedestrians or cars, have passed through a given area, like a gate, tunnel, or intersection. Such a system is also responsible for analyzing the direction of each moving object. Here it is proposed that a Moving Object Counting approach using Ultrasonic Sensor networks. Instead of using typical ultrasound sensor nodes, where each node has one ultrasound transmitter and one ultrasound receiver, it employs three-node ultrasound sensor clusters. Each cluster has one ultrasound transmitting node and two ultrasound receiving nodes. Such a three-node cluster approach can successfully offset interference problems and accurately detect the direction of moving objects.

Zalmai S.Shahbaz et al. [19] invented a particularly useful system for counting the passengers moving into and out of a common carrier vehicle such as a motor bus. Three ultrasonic ranging stations are provided to determine the presence and absence of passengers at three successive positions at the bus entrance. The three positions may correspond respectively to three steps through the entrance. Sequence logic circuitry is included for analyzing the sequence of passengers' detection at the three different ranging stations to establish a count of the number of passengers entering or leaving. In carrying out the invention there is provided an automatic counting system for non-uniform bodies moving at non-uniform speeds in either direction through a constricted passage comprising a ranging apparatus having three ranging stations spaced longitudinally along the passage for detecting the presence and absence of bodies to be counted at said stations, and a sequence logic circuit connected to said ranging apparatus for detecting and interpreting the sequence in which bodies are detected at said ranging stations for thereby counting the passage of bodies.

III. METHODOLOGY

To reduce the complexity of checking and avoid issuing bus cards, we have come up with a system that checks the status using a college ID card. The barcode scanner and the sensors are inputs to the controller. The LCD is the controller's output, which is used to intimate the driver when there is any unauthorized entry. The GSM is used to send the same message to the transport officers. The block diagram of the proposed methodology is shown in Fig 2.
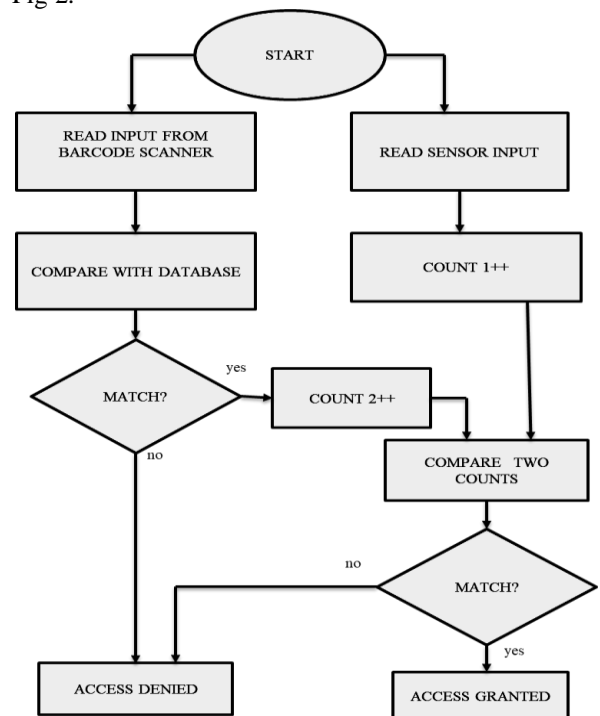

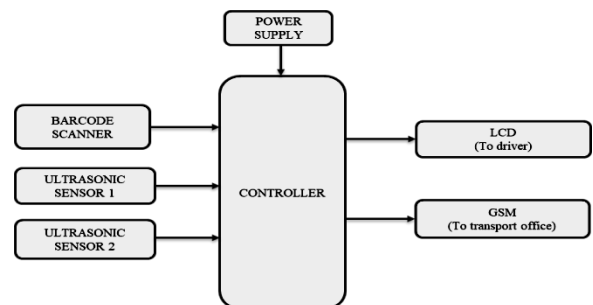Fig 1: Flowchart of the methodology

Fig 2: Block diagram of the methodology

The barcode reader is used to read the barcode in the ID card of the students. The data from the reader, which is the register number (eg:16EIR086) of the students, is given as input to the controller. The count1 will increase whenever the reader reads the

card. Here two Ultrasonic sensors are connected to the controller, and they are placed at the bus's entrance. These sensors are used to detect the persons enter the bus by increasing the count2. The necessity of the two sensors is to avoid the increment of count2 when the person enters the bus and leave immediately.

The count2 will increase when the sensor1 is detected before the sensor2. Likewise, the count2 will decrease when the sensor2 is detected before the sensor1. Then the controller compares the value of the count1 and count2. The unauthorized entry is detected when there is any mismatch between these two count values. The flowchart of the proposed methodology is shown in Fig 1. The LCD is used to intimate the driver if any unauthorized students enter the bus. The number of persons inside the bus is also displayed simultaneously. The GSM is used to send the same message to the transport officers along with the bus number. The working model is shown in Fig 3 and Fig 4.

IV.RESULTS AND CONCLUSION

The proposed project has been implemented with the status of intimating the driver and the transport office about the unauthorized entry into the bus. Thus it eliminates the tedious process of bus card checking. As it makes use of the barcode in our ID cards, the cost of issuing bus cards is eliminated. When students enter the bus, they will be permitted into the bus only if they have paid the bus fees. This will reduce the misuse of college bus facility by detecting the entry of unauthorized people. The sample output responses are shown in Table 1.

Fig 3: Real-time scanning process

Fig 4: Sample output displayed in LCD

V. FUTURE SCOPE

The proposed project can be extended by adding voice intimation to make it more convenient for the driver. This system can be improved by using IOT for updating the fees payment details so that it will be given access to the fees payment database instead of separately registering it. Thus the system can be made more efficient.

INPUT	REGISTERED / NOT REGISTERED	OUTPUT
16EIR059	UNREGISTERED	ACCESS DENIED
16EIR083	UNREGISTERED	ACCESS DENIED
16EIR084	REGISTERED	ACCESS GRANTED
16EIR086	REGISTERED	ACCESS GRANTED
16EIR090	UNREGISTERED	ACCESS DENIED
16EIR094	REGISTERED	ACCESS GRANTED
16EIR096	UNREGISTERED	ACCESS DENIED
16EIR105	REGISTERED	ACCESS GRANTED

Table 1: Sample output responses

REFERENCES

[1] Ankit Anil Agarwal, Saurabh Kumar Sultania, GouravJaiswaland Prateek Jain (2011) "RFID Based Automatic Shopping Cart" - Control Theory and Informatics.Volume 1.
[2] J.Awati and S.Awati (2012) "Smart Trolley in Mega Mall," - International Journal of Emerging Technology and Advanced Engineering, Volume 2.
[3] Kassim, M. H. Mazlan, N. Zaini, and MK Salleh (2012) "Web-Based Student Attendance System Using RFID Technology" - IEEE Control and System Graduate Research Colloquium, pp. 213–218.
[4] Lim, T.S., SC Sim, and MM Mansor. (2009) "RFID Based Attendance System" - IEEE Symposium on Industrial Electronics and Applications, pp.778–782.

[5] Mahyidin. M (2015) "Student Attendance Using RFID System" - Thesis, Electrical, and Electronics Engineering Department, University of Malaysia, Pahang.

[6] Quanbin Chen, Min Gao, Jian Ma, Dian Zhang, Lionel M. Ni and YunhaoLiu(2008) "MOCUS: moving object counting using ultrasonic sensor networks" - Int. J. Sensor Networks, Volume 3.

[7] Raju Kumar, K. Gopalakrishna, K. Ramesha (2013) "Intelligent Shopping Cart" - International Journal of Engineering Science and Innovative Technology (IJESIT) Volume 2.

[8] Saraswat. C. and Kumar, A. (2004) "An Efficient Automatic Attendance System Using Fingerprint Verification Technique" - International Journal on Computer Science & Engineering, pp.264-269.

[9] SatishKamble, Sachin Meshram, Rahul Thokal, RoshanGakre (2014) "Developing a Multitasking Shopping Trolley Based On RFID Technology" - International Journal of Soft Computing and Engineering, Volume 3.

[10] Shoewu, O., OM Olaniyi, and A. Lawson. (2011) "Embedded Computer-Based Lecture Attendance Management System"- African Journal of Computing & ICT. 4 (3): 27- 36.

[11] S. Sainath, K. Surender, V. VikramArvind (2014) "Automated Shopping Trolley for Super Market Billing System" - International Conference on Communication, Computing and Information Technology.

[12] Stefano Celestini, Oakville (2011) "System and method for verifying identity during data entry with a barcode scanner" - United States patent, Patent no.: US 7.878,409 b2 Celestini.

[13] Tabassam, N., P. Saim, K. Arash, and K. Azhar (2009) "Development of Academic Attendance Monitoring System Using Fingerprint Identification - International Journal of Computer Science and Network Security. 9(5):164-168.

[14] Victor, S., M. Jonathan, J. Reece, and J. Lemire. (2003) "Student Wolf Pack Club Tracking System"- North Carolina State University.

[15] Wright, A.W (2015) "Radio Frequency Identification Classroom Management System." Thesis California Polytechnic State University.

[16] Yang, D., Gonzalez-Banos, H. and Guibas, L. (2003) "Counting people in crowds with a real-time network of simple image sensors" -Proceedings of the 9th IEEE International Conference on Computer Vision, Nice, France.

[17] YK. Saheed, Moshood A. Hambali, Abdulmumeen A. Adedeji, and I.A. Adeniji(2016) "Attendance Management System Using Barcode Identification on Students' Identity Cards" - The Pacific Journal of Science and Technology, Volume 17.

[18] Yong, Z.Q. and L. Ji. (2006) "The Design of Wireless Fingerprint Attendance System. 2006" - International Conference on Communication Technology. 1–4.

[19] Zalmai S. Shahbaz, Klaus H. Frielinghaus,(1985) "Automatic counting system for passages" - United States Patent, Patent Number: 4,528,679.

[20] ZatinSinghal and Rajneesh Kumar Gujral (2012) "Anytime Anywhere- Remote Monitoring of Attendance System Based on RFID using GSM Network"- International Journal of Computer Applications (0975 – 8887): 39 (3).

[21] Shilpa Bhatt, Deepak Dhadwal and Ayush Bhatt, "RFID: Review & Comparison of Tree-Based Tag Collision Resolution Algorithms" SSRG International Journal of Electronics and Communication Engineering 2.3 (2015): 15-19.

[22] Abdul Karim Gesawat, Snehal Meshram, Akshaya Shende, Ankita Metangale, Ankita Chandurkar, Shiksha Pancheshwar, "Paper Title" SSRG International Journal of Electrical and Electronics Engineering 2.3 (2015): 6-10.