BRAILLE SUPPORTED ATM MODULE TO HELP BLIND PEOPLE

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Abstract :The aim of this project is to implement an Automatic Teller Machine (ATM) module to support blind community and to empower them to access the ATM machine independently. This paper proposes design of an ATM module where user authentication is done using RFID card and face recognition using image database. Blind users may select their respective options for withdrawal of cash through Braille keypad using audible instruction set in the same way as a normal person operates existing ATM.

***Keywords*- ATM Module, Audible Instructions, RFID, Braille Keypad Support.**

I. INTRODUCTION

There are different types of ATM machines available in the world such as On line ATM, Offline ATM, Biometric ATM using Fingerprint recognition etc. The 'Talking ATM' is available for blind people[3].Blind persons find it difficult of keying in PIN numbers, amount for cash withdrawal etc.The blind people have problem for money transaction because of lack of knowledge of computers, internet and mobile banking. They generally depend upon an assistant who is a normal person to help them complete their banking activity. They have to disclose the PIN to their assistant. The banking sector should work towards improving accessibility to banking services for blind person. There is a need to develop blind friendly ATMs that can be used effectively by the blinds without the assistance of anybody who may take advantage of their visually impaired state [2]. The blind people cannot follow the instructions on ATM keypad. There is no security and freedom of choice to blind people. It is in essential to provide Braille facility to blind customers. The proposed ATM module is supported with audible instruction set which can be used by a blind person through head phones. The module provides audio instructions sequentially. A blind person makes a choice using the Braille keypad and types his ATM Personal Identification Number (PIN), cash amount etc.

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II. PROPOSED METHODOLOGY

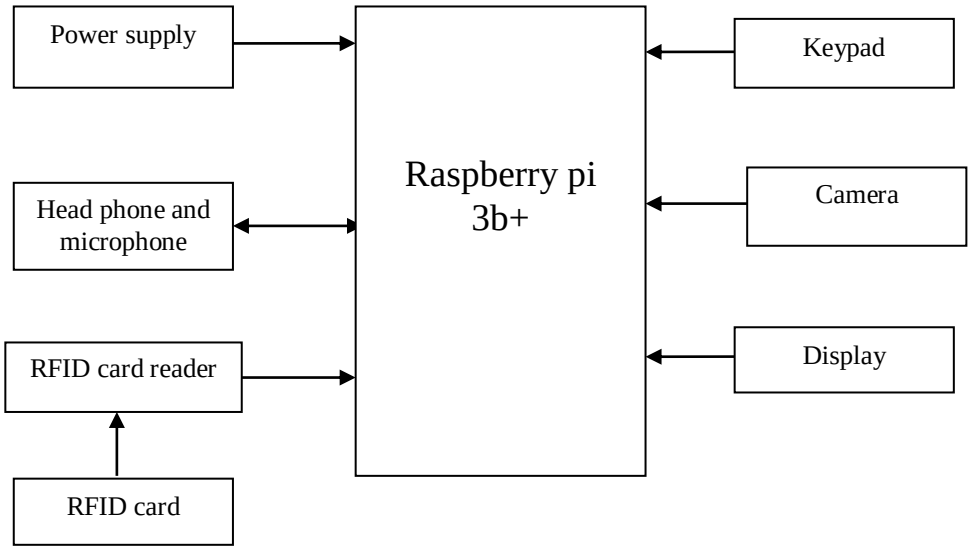


Figure 1. block diagram of Braille supported ATM module to help blind people

The ATM card provides information about user details such as name of the cardholder, 16 digit card numbers, expiry date, card verification value (cvv) etc.It is proposed to use RFID card having unique password allotted per user.

Table 1 sample user's data maintaining with ATM module

Sr.No	RFID User	RFID Number	Password	Expiry Date	CVV	Sex
1	Ankita Yadav	222,196,205,121	5141	12/2020	246	Female
2	Nikita Kapase	210,200,95,36	1234	1/2020	111	Female
3	Sneha Patil	210,200,95,45	3021	4/2025	434	Female
4	Arpana Jagatap	210,200,95,30	5544	3/2022	564	Female
5	Megharaj Bhosale	200,122,105,40	8954	6/2024	665	Male
6	Aakash Adke	210,145,120,60	6214	10/2028	120	Male
7	Mahesh Patil	222,160,124,65	2123	9/2020	322	Male

2.1 Steps-

1. Insert the RFID card and remove it.
2. Camera captures the user's photo.
3. If this photo is matches with image database then authentication of user is completed.
4. Listening the audio instructions using headphone and give respond by using Braille keypad.
5. Enter the PIN number by using Braille keypad.
6. If PIN matches then select the process otherwise enter the correct pin number.
7. By using audio instruction set users may choose options such as cash withdrawal, balance check, current/saving account etc. and perform ATMs activity.

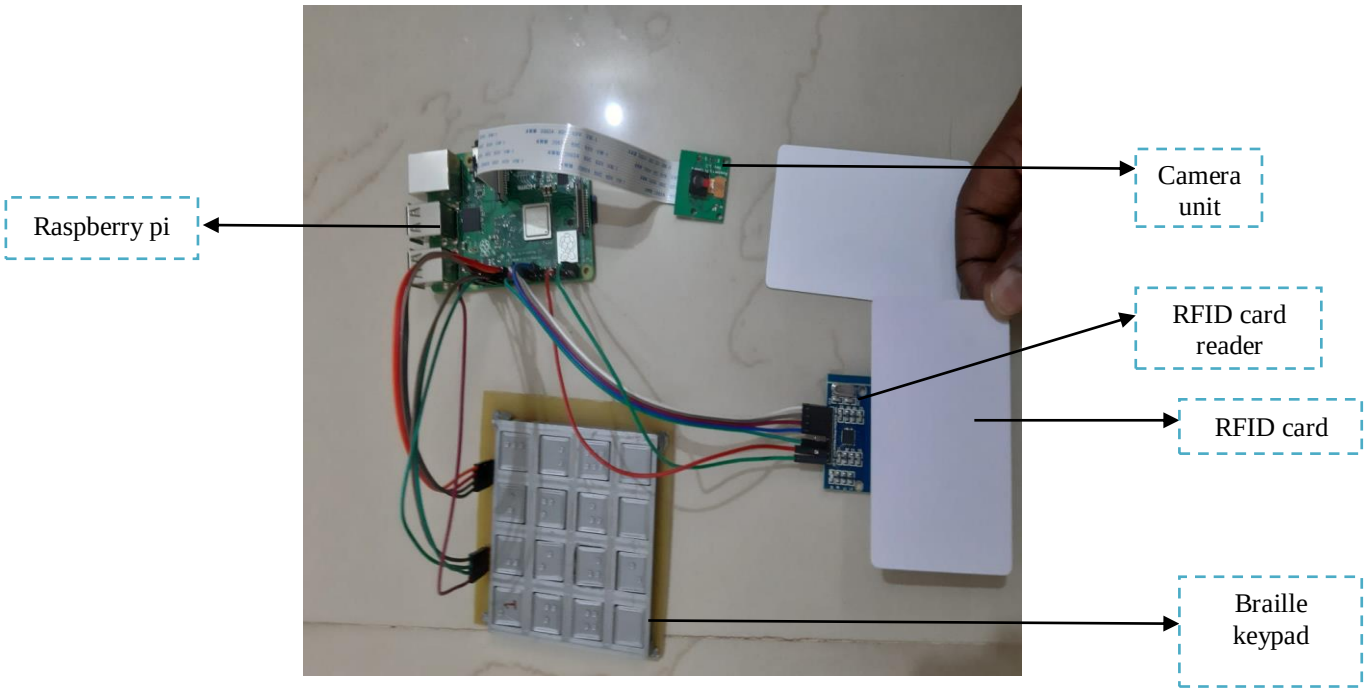
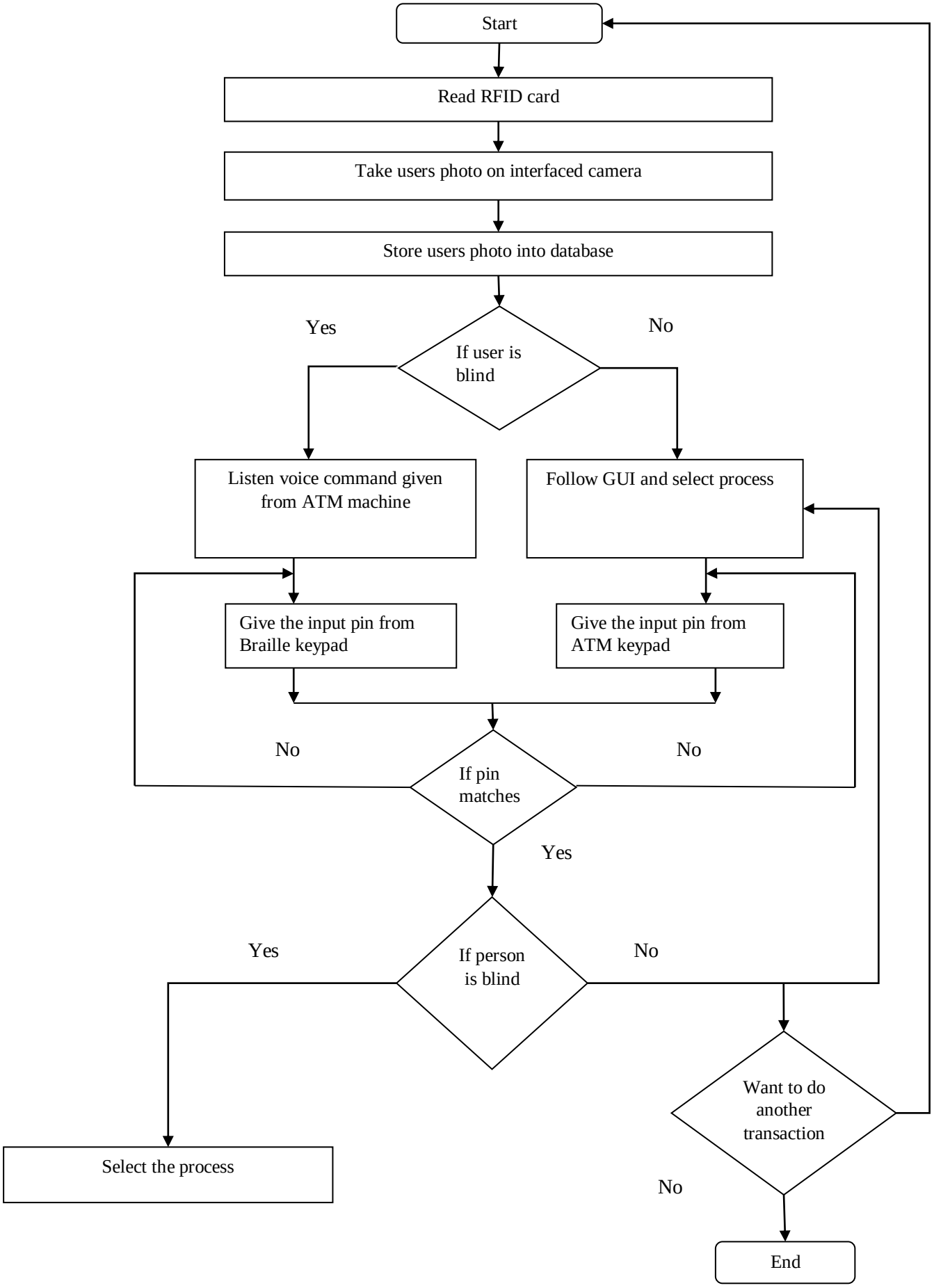
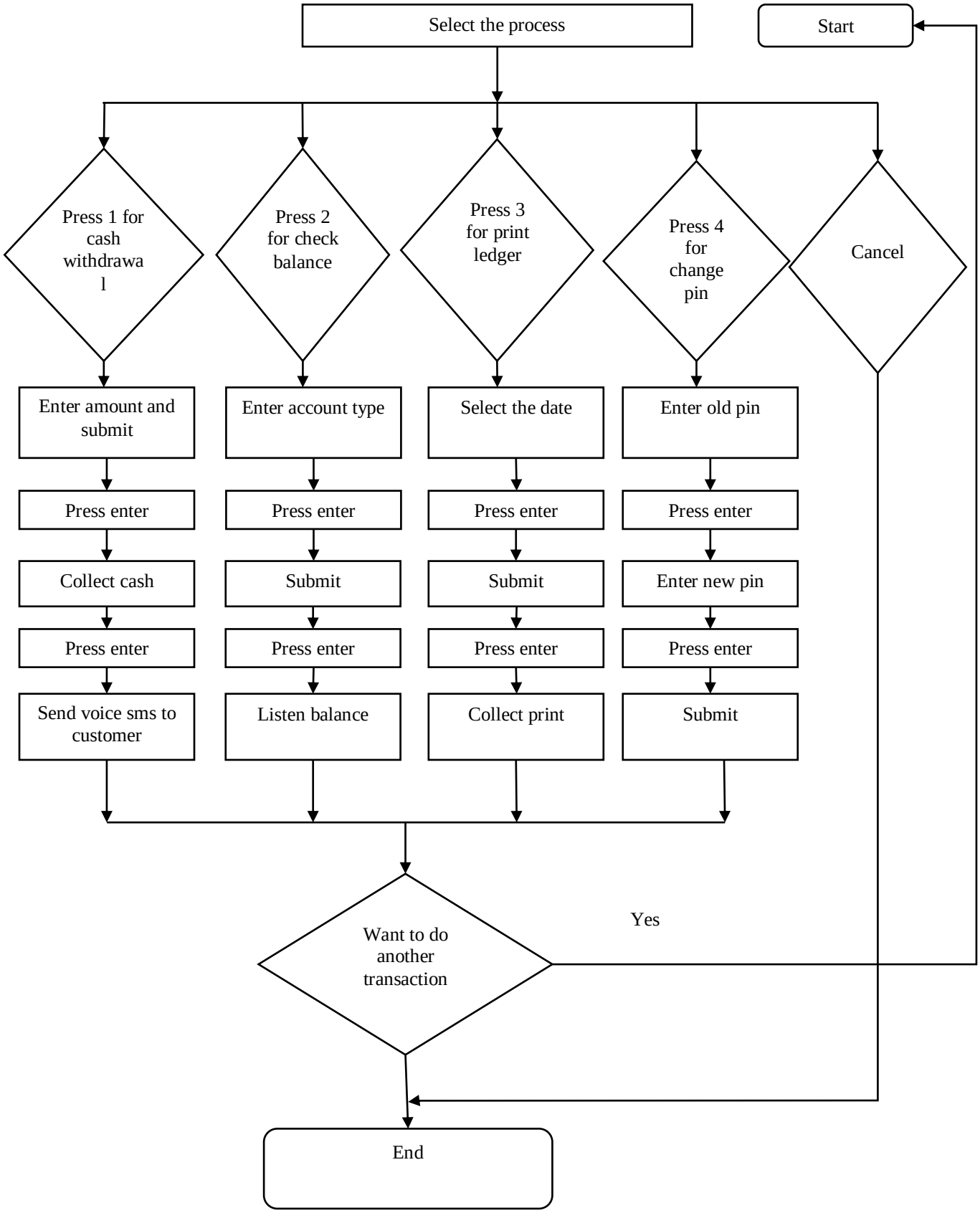


Figure 2.system hardware

III. FLOWCHART OF MODULE




Select the process
Start
Press 1 for cash withdrawa l
Press 2 for check balance
Press 3 for print ledger
Press 4 for change pin
Cancel
Enter amount and submit
Enter account type
Select the date
Enter old pin
Press enter
Press enter
Press enter
Press enter
Collect cash
Submit
Submit
Enter new pin
Press enter
Press enter
Press enter
Press enter
Send voice sms to customer
Listen balance
Collect print
Submit
Want to do another transaction
Yes
End

IV. Design And Working Of Braille Keypad

Four raspberry pi pins should be defined as outputs and other four pins should be defined as inputs. In order keypad to work properly, pull-down resistors should be placed on the raspberry pi input pins, thus defining logic gates when no button is pressed. Then the output pins set to logic one (1) and input pins logic state is read. By pressing any key, a logic "one" will appear on some input pin. By application of combination logic for "zeros" and "ones" appearing on the output pins of raspberry pi, it is determined which key is pressed by the customer. These keys of Braille keypad are printed by using the 3D printer machine.

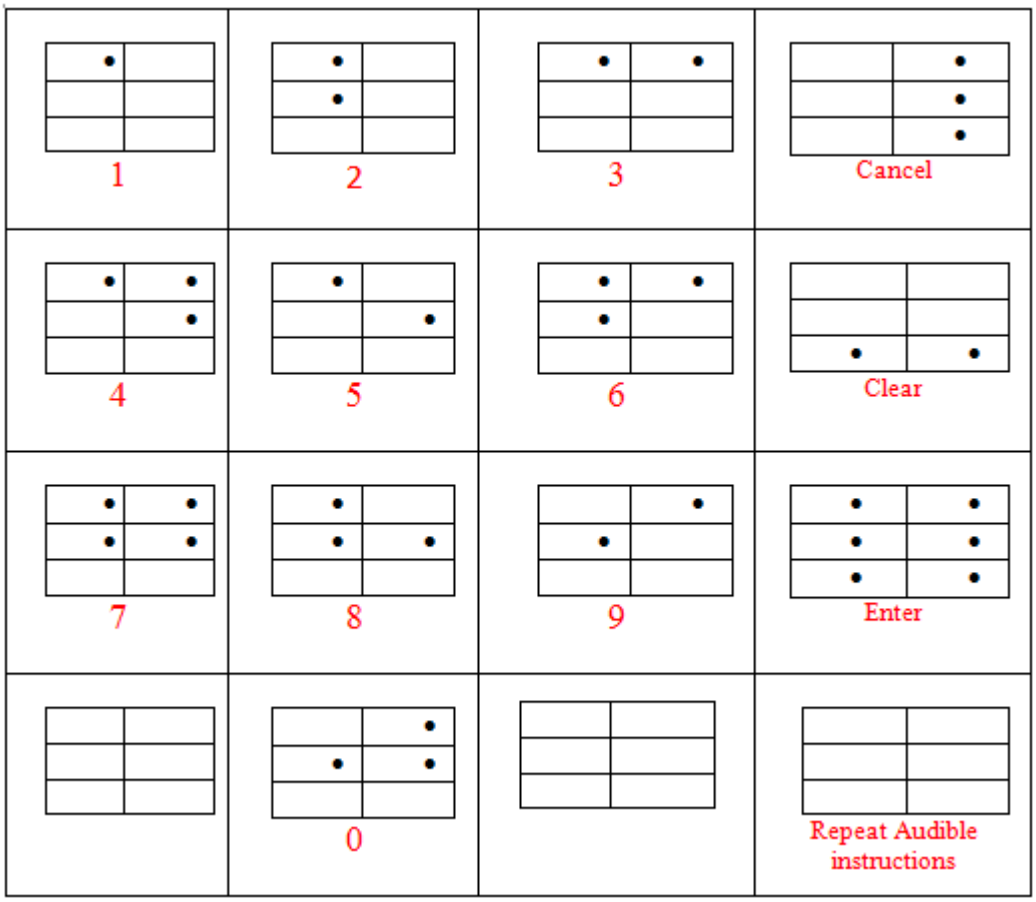
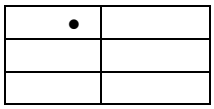
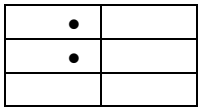
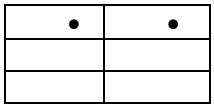
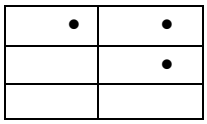
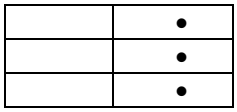
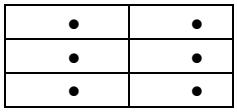


Figure 2. structure of Braille keypad for ATM module

V. Audible Instructions

The blind people are unable to see the screen of ATM machine so they face the problem for money transactions. In this proposed module the audible instruction facilities are provided hand by hand by using Braille keypad. This module consists of headphone jack. The blind people listen the voice commands by using headphone and complete the banking activity [4]. The instructions are recorded using text to speech synthesis. The blind people can listen these instructions carefully and perform ATM functions independently. Text to speech system converts language text into speech. This system is helpful for the people having visual impairments and reading disabilities. Hence by using this facility blind people can perform operations such as withdraw cash, money transfer etc securely.

Table 2 list of main audible instructions of ATM module

Sr.No	Audible Instructions	Keys to be pressed
1	Please enter your pin	Press4 digit pin number using Braille keypad
2	Please enter your correct pin	If pin is wrong then press correct pin number using Braille keypad
3	Select the process	Press any one key in between 1-4 on Braille keypad
4	To withdraw cash press 1	
5	To check your account balance press 2	
6	To print ledger press 3	
7	To change pin press 4	
8	To exit press cancel	
9	To select next process press enter	

VI. Conclusion

In this project Braille supported ATM facility is provided to the blind people. Hence, with the help of this system the blind people complete their banking functions independently. This proposed system also provides audible instructions with Braille keypad to access banking services. So this project is helpful for blind people to perform banking activities properly.

VII. Acknowledgment

We take the opportunity to thank a few of our friends from the society who are suffering from blindness i.e. impaired vision status for their contribution in research work. We would also like to thank 3D printer technicians for their support to design Braille keypad.

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