Electronic menu ordering system for railways

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Abstract - *An improved way to tackle the problems faced by the railway pantry services is introduced in this paper. The method introduced in this paper is constructed to be functional in all types of railways which would maintain a pantry car system. And also it should be feasible to all kinds of railways. The 802.15 ZigBee is used as wireless communication standard in this structure. The setup offered would incorporate two parts, first is device arranged in each coach in the restaurant and second part should be arranged at pantry and supply section. The setup also include a matrix keypad and graphical LCD interface for granting a smarter user interface menu ordering. The synopsis interpret about the algorithm used in execution of advanced menu ordering system by a wireless communication technology X-Bee and the process concern in its protocol stack. The system introduced is premeditated to be used by all types of people. The graphical LCD used in it delegates the feature of menu display with the graphical delineation that will be uncomplicated to comprehend by illiterate people also.*

*Key Words***:** 802.15, Zigbee, Xbee, LCD

1. INTRODUCTION

The demands of the people are increasing day by day so to meet their need and expectations technological improvement in every sector is necessary. Same applies in the case of railways too. The technological improvement provides a simple, yet effective reception of the customer with proper and satisfying food supply .The profits are welcomed by everyone so the technology that gave a hint of profit to the restaurant started improvising its method through it ,as it was noticed that from taking the customer's order to noting them down ,has the doubt of information loss, the process was noted to be dull the restaurant found that as the billing was made easy by modernization[2][3] same could be done by some more development in technological usage .The menu ordering had its flaw as more human workers had to be on clock as to respond quickly to each and every customer making it more difficult to keep up with every need so they switched to electronic menu ordering system which made up for every short coming that was there before thus communication between customer and the end supplier became easier and much faster with accuracy through wireless transmission in a feasible manner.[1] The e-menu ordering system setup differs with

the requirement and end need with the wireless communication to be considered according to the environment of system. The system introduced can be used in any pantry car containing railway or even for some restaurants, so that the Xbee is used as the medium for wireless communication and the graphical LCD driven by the matrix keypad is used from the customer's side.

2. LITERATURE REVIEW

As proposed earlier in the paper, the restaurant systems can be automated using IoT.[1] But this solution is valid only for the short range areas[2][3] wherein, stable internet connection is available. This system can be modified to be used as an automation solution in pantry car of the railways too.[5][6] The pantry system has variety of problems. A very common scenario is waiters making mistakes while taking orders given by customers. Many times, waiters disremember some items, note some changes, or forget to pass the order to the kitchen. Customer needs to wait for some waiter to take the order. Customers rely on various vendors to note the order and give specific details about availability of various items. Customers are also not able to find out current status of the order. Waiters also needs to communicate with the pantry for the status of order. Chef in pantry also needs to tell the waiters that the order is ready or not. Electronic menu ordering system is created using arduino nano to reduce the work of pantry staff and to improve the efficiency of the pantry. This system works on ZigBee communication system but uses a Xbee model with range longer than usual. The graphical LCD can access the database from the PC at pantry car and show menu list and order status. Passengers can enter their seat number, choice and browse the items and then order it.

3. PROBLEM STATEMENT

The old and current pantry food ordering system is a manual and cumbersome process that consists of pen, paper along with waiters. The order given by the customer is written by the waiter. The orders are then transferred to the kitchen where it is instructed to the staff and a bill is prepared. This system might not be complicated, but it has a high probability of the errors during noting down the order and also during calculations. We aim to design an easy and convenient wireless electronic ordering system which can be implemented in railways regardless of the internet connectivity and any third party application.

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4. METHODOLOGY

The system will consist of two sides i.e. transmitter and receiver section. The transmitter section will be installed at the passenger's side inside a coach or at the passenger's seat. The passenger will be able to view a list of all the menu items on the graphical LCD and select the desirable order and enter seat number with the help of the keypad matrix. Once selected the order details will be communicated to the receiver side wherein the setup will be interfaced with a computer. Once confirmed the user will be able to see the confirmation status of the order. This methodology appears to be simple yet effective elements the efforts of labour and establishes a direct communication between the customer and pantry with the help of X-bee technology either side have a custom of becoming both receiver and transmitter with proper input taken from customer keypad as well as pantry's computing side the total setup gives proper environment to converse about the customer's order and confirming the status of its order in a neat and clean manner.
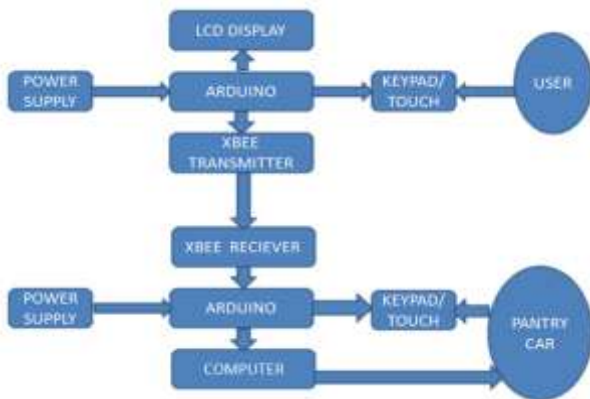

Figure -1: Block diagram of Electronic menu ordering system for railways

5. HARDWARE REQUIRED

Sr. No.	Component
1	Arduino nano
2	Buzzer
3	LCD
4	Xbee transreciever
5	Keypad matrix

6. SOFTWARE USED

1. Arduino IDE- For coding (Language- Embedded 'C' or Arduino 'C') :-It provides a platform for coding of the program and dumping it into the aurdino device.
2. XCTU- For X-bee configuration software. This versatile platform provides many tools to configure the X-bee device with the digital Rf modules

3. Proteus- For PCB designing. A popular and widely used tool for PCB designing as it provides an easy to learn and understand method of designing
4. Vb.net- For PC interface.The Pc interface is driven by this language which is more suitable for this kind of applications due to more sophisticated handling of the programming

The below flow chart has the basic idea of how the programming has been handled and as to whether the customer is fulfilled or not.it generally gets started by taking the input through the keypad at the customer's side. When the key is pressed the orders are selected accordingly as displayed on the LCD as per the program. To place the order the customer is required to press the'*'key in the keypad and to clear the data '#'is expected to be pressed as per the program, the programming continues with the order being placed as the data is transmitted to the pantry side where if the pantry user response on the on the interface is 'K' then the order is placed successfully.
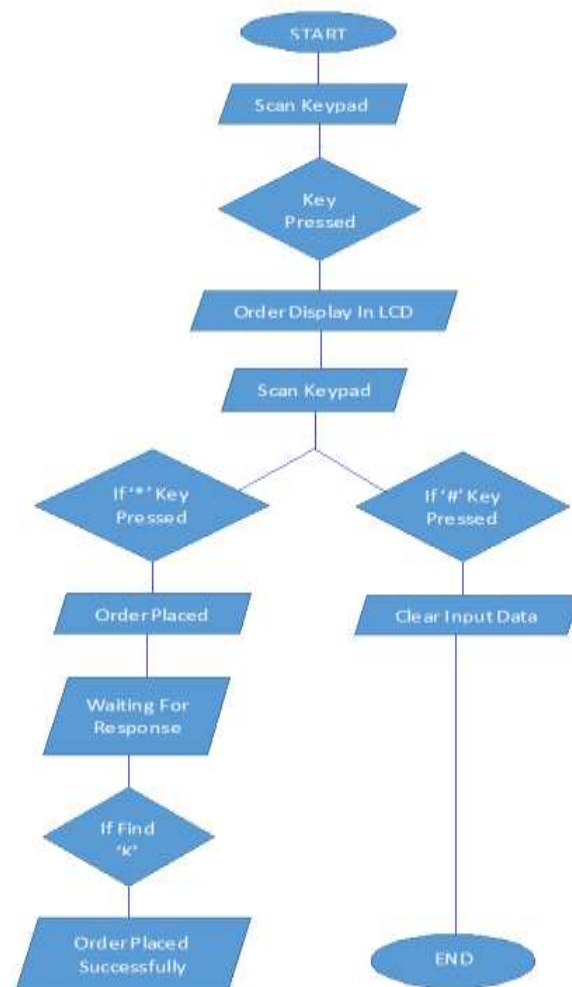

Figure -2: Software Flowchart
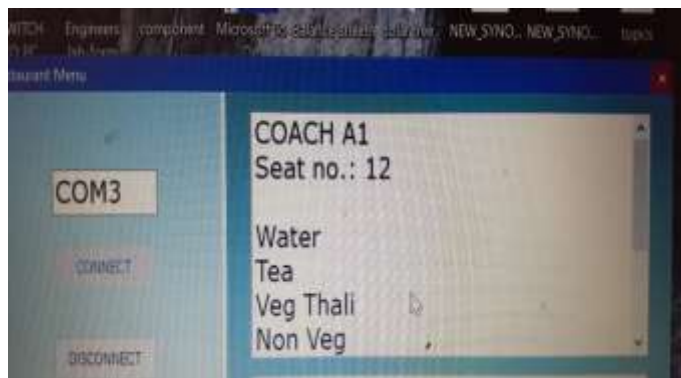
7. RESULTS

Figure -3: Customer Interface

Figure -4: Pantry Car's order received

Figure -5: Pantry Car's order confirmation

Figure -6: Customer waiting for confirmation

8. CONCLUSION AND FUTURE SCOPE

This system saves a good amount of time and labour as it provides automation for various operations. It shortens the time required for customer service. It improves customer's satisfaction, as this system takes very little time in communicating and delivering the order. Restaurants use connected systems where a variety of sensors are used and stock control is managed by the system. This can be implemented in the pantry car as well. E-menu ordering system should be easy for customers and clients to use. The pantry staff will be able to respond to customer's request immediately. Electronic menu ordering system will ensure that customers would always know about the availability of the items and the status of their orders without any hesitations.

As for future scope this type of system can be used in many forms with a little creativity added into the setup, we can provide update of the received order to the customer via SMS by intaking his/her phone number or instead providing a separate setup in each seat to know the status update also security can be itched into the program to provide a smooth handling of the system.

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