

Restaurant Payment Validation System

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Abstract : The issue of security is very paramount in any organization. In some spacious Restaurants and pubs there are issues related to Non-paying customers. Usually customers try to exit from the restaurants without clearing the bill. The ultimate motto is to disallow those customers from escaping who are with the intention of disappearing without clearing a bill. Therefore we have proposed a solution to settle the concern of Non-paying customers of Restaurants and pubs. The project points at a target of creating a secure solution for these defaulting customers. This is an approach to reduce the efforts of the staff while looking after the customers. It enhances the accuracy of the work in the Restaurants. The solution will strengthen the efficiency of Restaurant activities.

Keywords: Customer, Non-paying, Payment, Restaurants and pubs, RFID tag and reader.

Date of Submission: 29-03-2019

Date of acceptance: 13-04-2019

I. Introduction

As the customers normally tend to escape from restaurants and pubs which are spacious without making the payment. Few restaurants came up with an idea of collecting the identity proofs of the customers. It was mandatory for every customer to hand over their required documents to the managers of the restaurants. Not all customers could provide their original identity credentials due to security concern. As a result, most of the customers neglected going to the restaurants that were using this approach. This resulted in declining the sales of those restaurants in large amounts. Hence this concept failed and lacked in finding out an answer to this dilemma of Non-paying customers. It is not so suitable to collect the identity proof cards of the customers. As this plan didn't work well, we proposed a different solution to this concern.

The Restaurant Payment Validation System, in this project we are using RFID technology to solve the issue of such customers. In most of the pubs, customers are provided with bands so even in our solution every new customer will be allotted a wristband which will be embedded with a RFID tag. Each customer will be provided with a unique RFID. The sole aim of this purposed system is to implement a stable and simple billing process for making payment in pubs. In this way we can restrict the customers of the restaurant or pubs from exiting without making a payment along with the study of RFID and its application. Thus by using this approach, the manpower of the staff is saved who had to look after the customers every now and then. RFIDs are widespread and taking role in many advanced projects due to its fast and effective response. RFID is generally tags that are used for unique identification of products by using radio waves These tags could hold plenty of data like product name, price, size, weight and other information using their identification number.

A RFID reader is a device used to gather information from an RFID tag, which is used to track individual objects. Radio waves are used to transfer data from the tag to a reader. A passive tag is an RFID tag that does not contain a battery, the power is supplied by the reader. When radio waves from the reader are encountered by a passive RFID tag, the coiled antenna within the tag forms a magnetic field. The tag draws power from it, energizing the circuits in the tag.^[4]

II. Related Work

In 2005 Bhaskar Kumar Mishra et al.[1] . This work aims to substitute the traditional pen and paper method by automating the food-ordering process in the restaurant and thus improving the dining experience of the customer. Thus we are using this concept in our order and payment module.

In 2015 Aliakbar Akbari, et al.[2] states that RFID technology is more efficient than barcode scanner, as barcodes require that the scanner maintain a line-of-sight with each code, while RFID is a "near field" technology, so the scanner only needs to be within range of the tag to read it. Hence we are using RFID technology in our proposed system.

In 2017 Manikandan Thiyagajaran, et al.[3] made use of RFID for reducing the time spent by customers in a queue while shopping in supermarkets. Each product will be assigned a RFID tag, which the customer will scan if he wishes to purchase and the finalized amount of all the products will be displayed on the LCD screen which is placed on the trolley. Similarly in our proposed system we have assigned a wristband with an RFID tag to each customer which will be scanned to get all necessary details of customer.

III. Problem Statement

The problem that is faced by restaurants and bars relates to the Non-paying customers. While discussing about our project domain, one of our colleagues told us that his brother who is the manager of a Restaurant is facing the issue of such customers, he advised us to find a solution to this problem. Usually customers try to exit from the restaurants without clearing the bill, some do it intentionally and some might do it unintentionally cause of their half-conscious state.

The current method which few of the restaurants have adopted is that they collect the original identity proofs from the customers when they enter so that they don't escape without making a payment. It was mandatory for every customer to hand over their required documents to the managers of the restaurants, but it is not convenient for all of the Customers to hand over their original id proofs and hence some of the customers avoided visiting such restaurants. As this approach wasn't conducive we came up with a more convenient solution from the customer's perspective by making the use of RFID.

IV. Proposed System

The Restaurant payment validation system is being proposed to deal with this complication of such customers who getaway without making a payment. Every new customer will be allotted a wristband which will be embedded with an RFID tag provided with a unique RFID. All the necessary information such as contact number, customer name will be stored under the allocated unique ID.

When the customer wishes to place an order, the waiter will scan customer's wristband which has RFID tag. All the orders which will be placed by customers will be added under their RFID's unique id. As the Restaurants have ample amount of space, there are various sections such as food table section, dance floor, etc. When customer will place any order for any of those section it will be added to the centralized database.

When the customer has to leave the restaurant, the desired authority will scan RFID tag and then after customer clears the bill his bill will be generated. At the exit the collector will collect bands from all the customers. The customers who have RFID tag band will be scanned and it will check if the bill is paid or not and it will allow or disallow customer to exit accordingly.

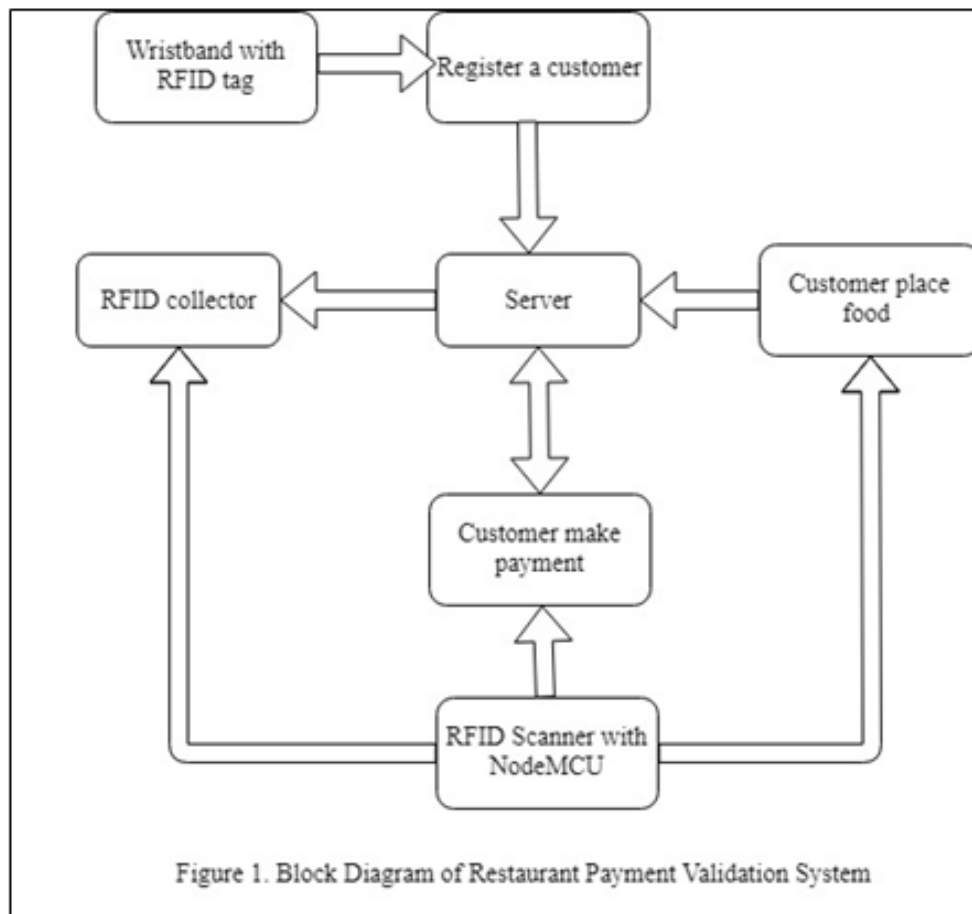
V. Scope

The proposed system has wider scope towards the Restaurants, pubs which are spacious in size, but the system won't be much applicable to the hotels which are small in sizes. As the amount of crowd in spacious restaurants is more as compared to the restaurants which are small in size. There are various sections in restaurants with ample amount of space so they are more prone to such customers who try to escape without clearing the bill. As there are spacious restaurants which are really in need of this approach to settle the issue of non-paying customers, this proposed system will be beneficial to them.

VI. Methodology

The Restaurant Payment Validation System consist of four different modules:

1. Registration.
2. Order.
3. Payment.
4. Exit.



The above figure shows four modules of Restaurant Payment Validation System as follow:

1. Registration

When a customer enters into a restaurant or pub, he will be assigned a wristband which will be embedded with an RFID tag. RFID will generate a unique number for each customer or a group. Under that unique number, customer's information like name, contact number and number of people (for a group of people) will be stored. Customer's contact number will be taken for security purpose which will be authenticated using OTP mechanism. The customer will be registered.

2. Order

Once customer's registration is done, the customer can place orders. The waiter will take orders and store that orders under the customer's unique order on a server. When customers will place any order from any of those sections it will be added to the centralized database. According to orders, bill will be calculated automatically.

3. Payment

Waiter will scan RFID tag and retrieve information about customer's bill. The customer will make payment. As soon as the customer makes payment, the bill will be cleared from the database.

4. Exit

At the exit the collector will collect bands from all the customers. The customers who have RFID tag band will be scanned and it will check if the bill is paid or not and it will allow or disallow customer to exit accordingly.

VII. Conclusion

The Restaurants and pubs are currently facing the issue of Non-paying customers, so the solution suggested will overcome the problem by using the RFID technology. Evidently RFID has outsmarted barcodes by its accuracy, fast response and durability. The system monitors the customers while checking in and out of the restaurants to ensure every customer has cleared the bill payment. Thus, the Non-paying customers in the restaurants will be controlled by using this system which helps to deal with the Non-paying customers

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Shweta Temkar. " Restaurant Payment Validation System." *IOSR Journal of Computer Engineering (IOSR-JCE)* 21.2 (2019): 45-48.