IOT Based Inline Errands (IBIE)

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Abstract— The Internet of Things (IoT) is an emerging technology that is creating an enormous network of things communicating with one another. It involves a broad set of technologies, hardware and software stacks. Data, humans, devices and communication are critical elements of an IoT ecosystem. The primary purpose of this research paper is to provide an advantageous application in day to day life in redeemable time factor. Now a day's shopping at malls is a daily or weekly activity of domestic life. Survey states during the initial week of month and weekends are the peak sale periods at shopping malls and super markets. Often equivalent time is taken for billing and payment as time taken for shopping. The Application introduced in this paper provides smart solution to redeemable time.

Index Terms— IoT (Internet of Things), Quick Response (QR) Code, Mobile Application, Smart Phone

1 Introduction

Each human being is being influenced and habituated with a new byword, namely Internet of Things [IoT]. Globalization has been taken forward and the world is now becoming truly boundary less connected by means of technology. The internet network is connecting things or electronic devices with creative innovations and expedient new services. IoT is essentially a system where the Internet is connected to the physical world via a multitude of sensors. Today most of the (end) nodes on the Internet are people using (smart) phones, tablets, laptops and computers. By 2011, the number of Internet-connected devices [12.5 billion] had surpassed the number of human beings [7 billion] on the planet. The number of Internet-connected devices are expected to number between 26 billion and 50 billion globally by the year 2020 [2]. This paper deals with people with smart phones and IOT based application at shopping malls, Shopping malls are been the places where people get their daily necessities ranging from food products, clothing, electrical appliances etc. Sometimes customers have problems regarding the incomplete information about the product on sale and waste of unnecessary time at the billing counters. Continuous improvement is required in the traditional billing system to improve the quality of shopping experience to the customers. Now day's numbers of large as well as small shopping malls has increased throughout the global due to increasing public demand & spending [1]. At the time of festivals, special discounts, holidays, etc. there is a huge rush in shopping malls. The use barcode reading technique in such situations always results in waste time since customer has to wait till whole items get scanned. These advantages can be avoided by using IOT based Smart phone application is proposed in this paper. This concept uses QR Code scanner via smart mobile application in IoT technique instead of barcode

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2 Concept – IOT based Inline Errands (IBIE)

2.1 Overview

Implementation of the concept IOT based inline Errands need very marginal investment in shopping malls. The investment in terms of mobile application development and establishment of secured Wi-Fi in shopping mall. The block diagram in fig 1 depicts the overview of the concept.

Fig. 1. Concept overview

Essential Modules in the concept:

Mall Application: IBIE Application, Specific smart phone based application with provision to link with items data base for price details and bill generation.

QR Code: QR Code on each item to indicate the item code when scanned by customer.

Smart phone: Smart phone with specifications. 2.5 GHz Quad-core Processor, 1/2 GB RAM, 16/32 GB internal Memory, 3G/4G connectivity, Wi-Fi, 5MP camera

Android OS: As it is a non-proprietary platform that has shipped on devices covering a wide range of market segments, Android has seen significant adoption. Gartner Research estimated that 325 million Android smartphones were sold during the fourth quarter of 2015 and the estimates were very much true

Items Data base: IBIE app from smart phone shall connect to cloud data base for customer details, item price and updates The IBIE app can further be enhanced to maintain the stock position and reporting features, these features are not addressed in this paper.

2.2 Procedure

The procedure for execution of IBIE application is defined in this section. The procedure in explained consider a customer and shopping at super market with groceries as items for purchase.

Phase -1: when the customer visits the super market, the steps to be performed by customer as follows

- As pre-requisition, customer need to download the IBIE application in their mobile
- Customer can use the WI-FI network in the super market for internet access after authorization
- Vendor in super market will place the daily QR Codes in the shop, this QR code contains the Wi-fie SSID Password, which helps the customer to get connected to the vendor Server to accesses the Items Codes by IOT.
- When customer scanned the QR code using smart phone for WI-FI access, customer will get connected to Shop wireless network environment, this QR code will act as password for authentication
- When customer is connected in the WI-FI network, the specific customer details are registered (like customer name, address, mail and his mobile number) and IBIE app server (At super market) will provide a unique code to customer as acknowledgment. Indicating customer is authorized to utilize the WI-FI and proceed with shopping.

Phase-2: Shopping inline, customer proceed a head with shopping and steps to be performed as follows

– Enter shopping area for purchase
– Customer scans the QR Code of the Items opted to purchase
– Opted and selected items are added to the cart on his mobile IBIE application
– The IBIE application in the mobile retrieves the price of opted item from the data base
– Cart can be modified, deleted and edited any time of his shopping before billing.
– Once customer done with the shopping, option for customer shall be prompted for collecting or Door delivery
– Once customer done with the shopping, it is time to pay money. Customer can pay money by Credit Card / Debit Card / online payment.
– There is other option customer can pay cash by pushing his cart to Sales Man at the super market billing counter , for this customer will opt option to forward the cart to sales man Additional features in IBIE application which can be incorporated
– Followed by the payment of bill by customer, the purchased items quantity in main stock list will be updated
– This will update the Main Server list immediately and the vendor's staff can see those status and fill all the items accordingly for next shopping
– This helps vendor to track the items dynamically, if any shortage on the items our system will raise an alert to vendor
– Vendor can also update the discounts on daily basis in application, they can be viewed by customers who are visiting his shop
– Complete transactions can be maintained by each vendor on their own and Vendor can maintain the customer data base for his future reference

2.3 Operation work flow

The operational flow diagram of IBIE application post download and installation is detailed below.

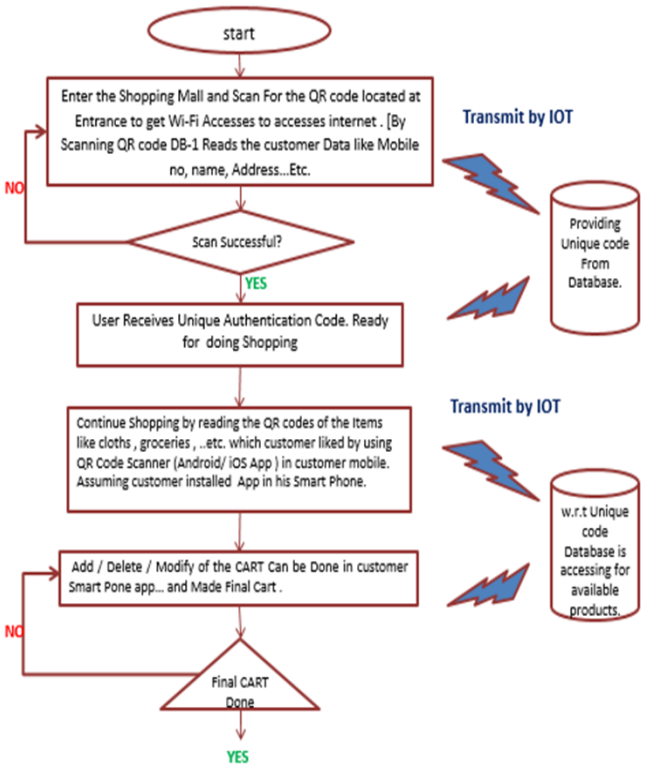

Fig. 2. IBIE work flow -1

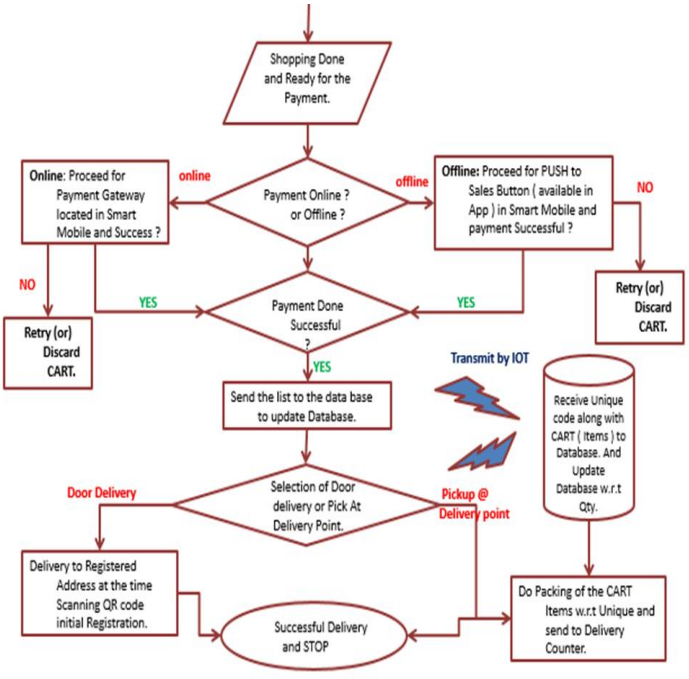

Fig. 3. IBIE work flow -2

3 RESULTS

IBIE application is implemented with core concepts and proven the meritorious utilization of Internet of Things (IoT)

Fig 4 : IBIE App icon

Fig 5 : IBIE App Launch

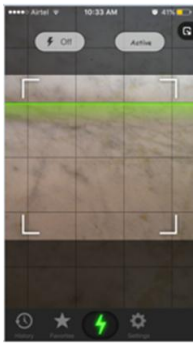

Fig 6 : QR code scanning

Fig 7 : QR code scanning -2

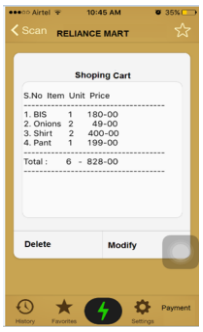

Fig 8 : Add items to cart

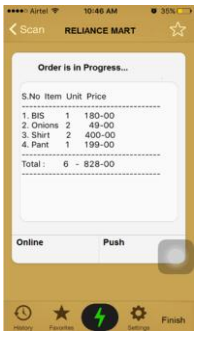

Fig 9 : Payment mode

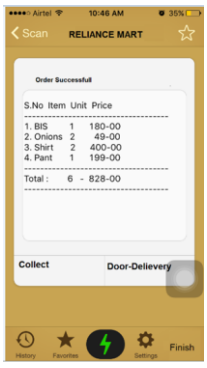

Fig 10 : Delivery Option

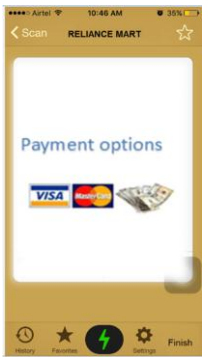

Fig 11 : Online payment

4 ADVANTAGES

1. Does not need any special training.
2. Customer can get throughout information at the time of shopping.
3. Can monitor exact amount at the time of shopping.
4. Save billing and queuing time
5. Reduce rush at billing counter.
6. Release staffs from repetitive checkout scanning
7. Advantage over online shopping, Can feel they are taking correct quality / material and genuine products.

5 APPLICATIONS

This concept can be in used for automatic billing at Shopping malls and super markets. Additionally this concept can be enhanced and used as common observatory system for owner as he/she can observe billing at malls from anywhere.

6 CONCLUSION

The collective combination of IoT with smart phone application will provide the proof of IBIE concept. Automatic billing through IBIE concept will save the time of customer and reduce the rush at billing counter. It also reduce the man power. Also because of IOT with minimal enhancement this concept will also helpful the owner for online business monitoring.

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