International Journal for Research in Engineering Application & Management (IJREAM)
ISSN : 2494-9150 Vol-02, Issue 08, Nov 2016

Cloud Based Canteen Management System

[1]Tazeen Khan, [2]Daniel Yunus

[1,2]Final year B.E (Computer), Rizvi College of Engineering Mumbai, Maharashtra, India.

[1]*tazeenfirojkhan@gmail.com*, [2]*dani.020196@gmail.com*

Abstract **Today everything around us is automated. Manual and paperwork has been replaced by automation. Automation decreases errors and helps in increasing efficiency. As canteens are a daily part of students, employees, staffs. The existing system is paper based where problem are faced by both the customer and owner. This paper proposes a system to make the whole process easier for both the canteen and for the customers by automating the process on Cloud. With the help of Cloud Computing technology no hardware components and installations are required. Hosting on cloud is cost effective than owning individual components. This proposed system bridges the gap between canteen and its usage. We have offered Radio Frequency Identification based card that will be used for the transactions of each customer at the counter. Also, to reduce the queues another method to order and pay is through mobile based app where deductions are carried out directly from the customer's account. Account can be recharged through online transfer and e-wallets. Both the web and mobile applications will be hosted on cloud.**

Keywords —Auto Scaling, Cashless, Cloud Computing, e-wallets, Load Balancing, RFID

I. INTRODUCTION

Canteens are present almost in all the Colleges, Institutes and companies. The existing system is a cash and paper based system. The payment and process takes a lot of time as the customer has to pay the exact amount and wait for the change. If the change is not available at the time, a coupon is provided which should be shown at the counter at the next purchase. The canteen executive has to store this record in the registers for totalling and verification purpose. The cash at the end of the day have to be kept safe. Since the existing system is also paper based it has a big disadvantage of data integrity, calculations have to be done manually and the data can be easily manipulated or lost.

Other system include billing process through smart card which only deals with the payments. RFID card provides a cashless based system but the method of recharge is through cash. There are chances of long queues just for recharging the card. Major drawback in such system is that the balance is stored in the card itself. If there is any damage or loss of card, the amount will be lost as there is no record. It also has restricted time limit in which the card can be used.[2]

In our proposed, the issue of not only payments but the entire hectic management of a canteen business is easily managed. There is no need for long queues, order can be placed at faster pace. No paper based records are need to be maintained. Migration of data to the cloud is needed only once. It automates the entire Canteen Business. he Colleges, Institutes and companies. The existing system is a cash and paper based system. The payment and process takes a lot of time as the customer has to pay the exact amount and wait for the change. If the change is not available at the time, a coupon is provided which should be shown at the counter at the next purchase. The canteen executive has to store this record in the registers for totalling and verification purpose. The cash at the end of the day have to be kept safe. Since the existing system is also paper based it has a big disadvantage of data integrity, calculations have to be done manually and the data can be easily manipulated or lost. Other system include billing process through smart card which only deals with the payments. RFID card provides a cashless based system but the method of recharge is through cash. There are chances of long queues just for recharging the card. Major

drawback in such system is that the balance is stored in the card itself. If there is any damage or loss of card, the amount will be lost as there is no record. It also has restricted time limit in which the card can be used.[2].There is no need for long queues, order can be placed at faster pace. No paper based records are need to be maintained. Migration of data to the cloud is needed only once. It automates the entire Canteen Business.

II. PROPOSED SYSTEM

The proposed Canteen Management System (CMS) is a cost effective solution for schools, colleges and companies. It is a cloud based cashless system which is based on RFID and e-wallets for transactions. Because of cloud cost and maintenance of hardware is eliminated. Features of cloud such as auto-scaling, load balancing and pay as you go enhance the working of the system and largely solves the purpose of the proposed system. Our system will provide website and mobile apps which will be hosted on the cloud. Every canteen system has different requirements which are customization with our proposed System.

In case of large scale institutes, companies, IT parks there are large number of customers who place an order at the same time. The number of requests to the application increases. Normally due to large number of request the application may crash down But due to load balancing of cloud easily tackles and eliminates this problem. The instances can be increased or decreased as required. In case of centralized server system when there is less load there is wastage of resources. Large amount of capital is invested in maintaining and upkeep of the servers even when the servers are idle. All records maintained in a particular canteen system is stored on the cloud. No paper based records are needed, large number of records can be stored easily which is not the case in paper based records. Migration of existing paper based data is needed only once to the application in cloud. Cloud service provides backup of data in case of disaster. The card provided is an RFID based card that will hold the number of the customer. Card number and customer's mobile number uniquely identifies a customer. Card is used to place an order at the counter. In case of a loss or damage of the card the card can be instantly blocked by placing a request to the administrator or through the app or website. Order can also be placed through the mobile app. Facility of alert is also provided, the customer can choose the method whether sms or alert notifications on the app.

The CMS keeps a track of the total number of orders of the day/month/year, the most popular dish, an algorithm to predict and show what ingredient or food supply the canteen needs to restock and when will it be exhausted, the spending on restocking the supply, it calculates the profit/loss of the system, salary of the employees can be directly transferred to them online. Chances of manipulation of data is very low as everything is online.

The different types of user in a system are Customer, owner, manager, controller, cooks /chef, other employees if any. Every user of the website is provided a secure login. Employees login is given by the owner as he adds/delete an employee. Employees who are present at the different counters are required to login into their respective accounts to place order. Selling statistics by each individual employee can be viewed by the owner. All the sales by the different employee are added up to calculate overall sales of the day.

A. Working

Initially the new customer will go to the manager to register himself, he will provide his mobile number. For verification an OTP will be sent on his mobile number. After confirming the valid otp, the manager will provide him with a RFID card. Manager will enter the customer's name, number, rfid card number and selects the category of employee if any to create a new customer entry in the database. Mobile and card number will be the username and password for the customer to login into the website. Customer can change his password if he wishes to. He can recharge his card, update profile, view transaction history, maintain his profile, deactivate card, give suggestions or feedback, check out new offers on recharge or

food, check statistics of his expenditure. Recharge can be done through online payment, e-wallet or through cash to the manager in case the first two method does not work. Any changes made in the account will be notified to the customer. Customer can select sms, app alert or email method through which he wishes to be notified.

Customer provides the card at the counter which will be scanned by the controller. The card number is checked into the application's database. If valid then the relevant information i.e. name, balance and type of customer is returned to the screen of controller's tablet. After verifying the validity and sufficient balance, customer can place the order, he specifies special instructions i.e. no cabbage in the rice, customization like replacing rice with noodles. If the customer wishes to cancel the order he can do so at that instance only. The controller only needs to click on the image or icons of different dishes and it will be added to the cart. To further process the order, controller will place the order. Once the order is placed and confirmed, amount will be deducted from the customer's account Alert is sent to the customer specifying the details about deduction from his account balance (refer Fig 1).

Order is notified to the cooks who will also have a touch enabled tablet in which they can view the order and any customization if specified. When the cook starts making the order he will specify on the website that order is in processing. So that if customer wants to track his order, controller can give details about the order or check on the app. Once the order is prepared customer will be notified through app notification or sms Customer can come and collect his order from the counter. All the orders that placed works in FIFO manner so as to avoid conflicts.

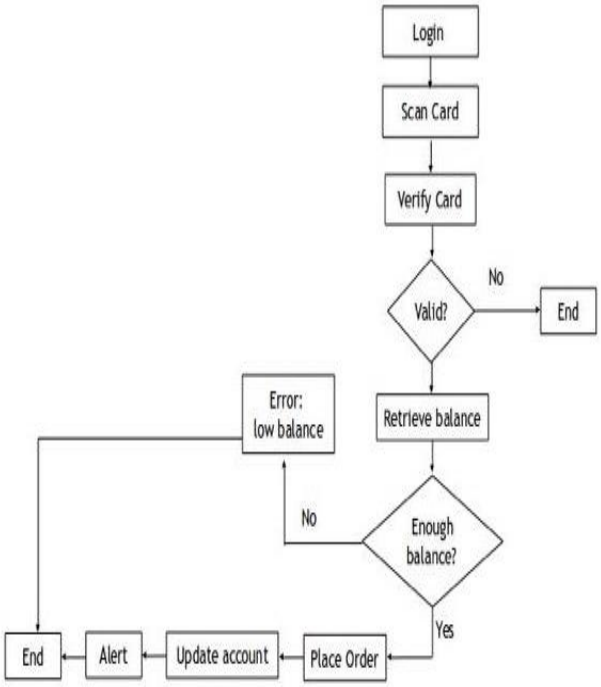

Fig 1: Placing order using RFID Card

Other way to place an order is through the mobile app. Here the customer can enter the order specify the time, add customization if any and place the order. The amount will be deducted from his account. Order placed through the app will be sent to the manager he will confirm the order. Order confirmation will be sent to the customer. The app will process the order on first come first serve basis (refer Fig 2).

Manager manages the finances, inventory and marketing of canteen. He also looks after the inventory, attendance of other employees. At the end of the day he updates the inventory about how much food stuff is used up in a day. He manages the menu and their prices along with any offers if any. It may happen prices may vary according to the category of customer, it is handled by the manager. Any new dish added will be notified to the customers. Every employee of the canteen can login and view his own profile, salary, attendance, progress. He also has the authority to block card, take cash payment for recharge. Monthly bills amount will be entered by the manager into the system for monthly calculation. Owner keeps a track of everything going on in the canteen. Employee's are added by the owner only. He

transfers the salaries to the employee's account based on their performance and attendance. Other bills such as electricity, internet, maintenance charges will be calculated. All income and deductions are taken into account and monthly report is generated which will show how much profit or loss his business has gained. He also checks how much stock has been used up in a day and whether the restocking is done as per requirement. Different statistics like profit, loss, stocks, popular dish, employee attendance can be viewed by him.

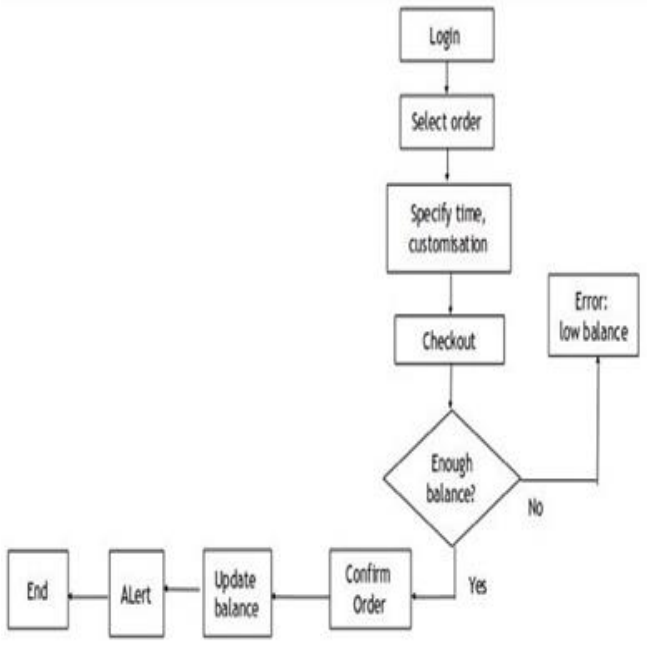

Fig 2: Placing order through Mobile App

III. TECHNOLOGY USED

A. Cloud Computing

Cloud computing is transformative computing paradigm that involves delivering services and applications over the internet. It involves provisioning of resources such networking, computing, storage which can be utilised on demand [1]. With pay as you go model it enables users to pay only for what resources they have used.

There three different types of cloud service models- Infrastructure as a service(Iaas), Platform as a service (Paas) and Software as a service(Saas). One of the important features of cloud computing is Load Balancing and Auto-scaling. Cloud Computing resources can be scaled up and down depending upon demand and performance requirement of application.

Load Balancing distributes workloads across multiple servers to manage application workloads. The goal is to achieve maximum utilization of resources, minimizing response time thereby increasing the output. It distributes the incoming user requests. This feature helps in managing a large number of requests to the application. For our proposed system itself break time will have large number of customers who will access the application it is sufficiently managed by this feature which increases reliability of our system.

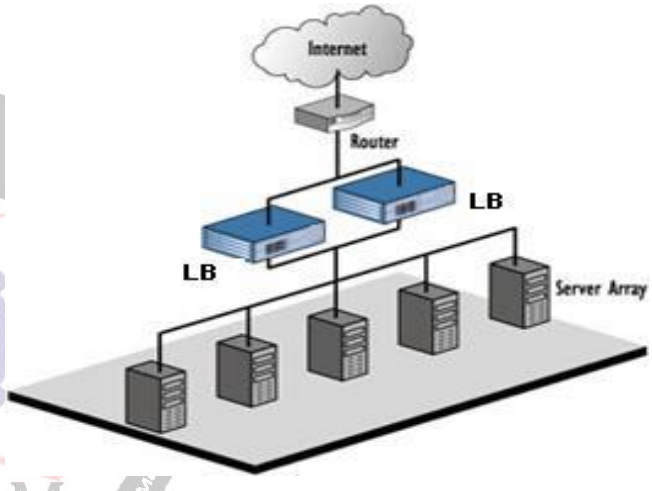

Fig 3: Load Balancing

B. RFID Technology

Radio-frequency identification (*RFID*) uses electromagnetic fields to automatically identify and track tags attached to objects. It is a data repository where information can be stored and accessed as per need. The different components involved in the design of an RFID are Reader, tag, Middleware, Backend Database and Antenna [4].

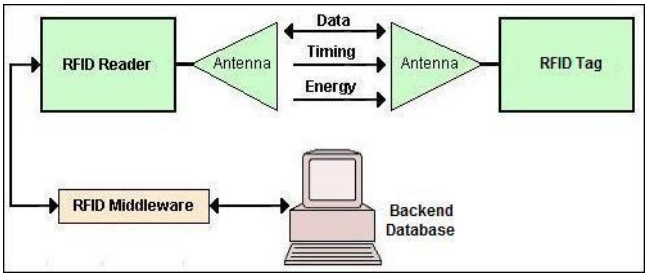

Fig 4: Components of RFID

A significant advantage of RFID devices over barcode is that the RFID device does not need to be positioned precisely relative to the scanner. RFID card is that the card can be used anywhere in the vicinity of the scanning device. RFID card uniquely identifies an user which helps in mapping his transactions, balance to his account. When the card is scanned the unique number is searched in the database if the card is valid it returns the relevant information else it displays an error. Errors can be of different types: blocked card, invalid card.

IV. IMPLEMENTATION

The application first needs to be hosted on the cloud. It can be done by using AWS EC2 or any other cloud service provider who has auto-scaling and load balancing feature. Website and mobile apps can developed according to the preferred choice of language. In our proposed system we have used HTML5,WORDPRESS (front end) and GO(server side language) for website. Ionic framework for iOS and Android app.

V. CONCLUSION

Thus we have proposed a system to effectively manage and automate the process of a Canteen business. This project is very easy to operate and acquires fast response.

The advantage of using a cloud based system is that the scale of a canteen does not make any difference. This system can be implemented on small as well as large scale canteen business. Through the friendly user interface of web and mobile apps the different user of the system does not need special kind of training and can use the application with ease. Owner can keep of track of everything going on in his business which gives him a better control over his business. Manipulation of data in terms of number of food products sold in day, products in inventory is eliminated because of automated system. There is record of every sales. Suggestions/feedback can be directly viewed by the owner. All the necessary calculation and tally of profit/loss, total income are done by the application itself. Manager does not need to maintain log books. Because of cashless system manipulation of cash is eliminated.

REFERENCES

[1] Ashalatha R, Jayashree Agarkhed - *Evaluation of Auto Scaling and Load Balancing Features in Cloud*- International Journal of Computer Applications (0975 8887) Volume 117 No. 6, May 2015 from P.D.A. College of Engineering, Kalaburagi, India.

[2] B Muniraja , J Rajanikanth - *In-Time Billing Process for Canteen Management System* - International Journal of Emerging Trends in Engineering Research (IJETER), Vol. 3 No.6, Pages : 200- 203 (2015).

[3] S. Ornar, Member, IEEE, H. Djuhari- *Multi-Purpose Student Card System Using Smart Card Technology -Information Technology Based Higher Education and Training*, 2004. ITHET 2004.Proceedings of the FIfth International Conference in January 2004 from The University of New South Wales UNSW, Sydney, NSW 2052, Australia.

[4] SumitaNainan1, Romin Parekh, Tanvi Shah - *RFID Technology Based Attendance Management System* from NMIMS University Mumbai, Maharashtra.

[5] V.Bharani, S.Janani, Mr.A.Kanagasabapathy - *STUDENTS AUTOMATION SYSTEM USING RFI*D - International Journal Of Engineering And Computer Science ISSN:2319-7242 Volume 3 Issue 3 March, 2014 Page No. 5031-5035.

[6] Luis M. Vaquero1 , Luis Rodero-Merino1 , Juan Caceres, Maik Lindner - *A Break in the Clouds:Towards a Cloud Definition* - ACM SIGCOMM Computer Communication Review 50 Volume 39.

[7] Ms. Shilpa D.More1 , Prof. Arti Mohanpurkar - *LOAD BALANCING STRATEGY BASED ON CLOUD PARTITIONING CONCEPT* - Multidisciplinary Journal of Research in Engineering and Technology, Volume 2, Issue 2, Pg.424-431.

[8] Shweta Shashikant Tanpure, Priyanka R. Shidankar,.Madhura M. Joshi - *Automated Food Ordering System with Real-Time Customer Feedback* - International Journal of Advanced Research in Computer Science and Software Engineering Volume 3, Issue 2, February 2013.

[9] Timothy Hoye , Joseph Kozak - TOUCH SCREENS: A PRESSING TECHNOLOGY - University of Pittsburgh April 10, 2010 TENTH ANNUAL FRESHMAN CONFERENCE.

[10] Arun N. Nambiar- *RFID Technology: A Review of its Applications* Proceedings of the World Congress on Engineering and Computer Science 2009 Vol II WCECS 2009, October 20-22,

