

Evaluating the Quality of Point of Sale (POS) Software

Soobia Saeed¹, Asadullah Shaikh², Muhammad Ali Memon³, Muhammad Ali Nizamani³, Faheem Ahmed Abbasi³, Syed Mehmood Raza Naqvi⁴

¹Department of Software Engineering, Institute of Business Management-IOBM,

²College of Computer Science and Information Systems, Najran University, Saudi Arabia,

³Institute of Information & Communication Technology, University of Sindh,

⁴Department of Computer science, Sheridan College, Canada

soobia_saeed123@hotmail.com, asshaikh@nu.edu.sa, muhammad.ali@usindh.edu.pk,

ma.nizamani@usindh.edu.pk, faheem.abbasi@usindh.edu.pk, dr.naqvi@gmail.com

Abstract: Businesses are progressively adopting the Point of Sale (POS) system. This system has a wide range of use which includes; inventory management, sales monitoring, stock counting and reporting, etc. Current POS systems are considered costly and time consuming systems due to high hardware installation (need separate servers etc.) and maintenance cost. Also, software need timely up gradation and maintenance. Cloud-based POS software can help reduce some of these limitations of POS system. This system will provide new dimensions to the business. This software will be easily accessible by using internet connection and can be installed on mobile phones, tablets or laptops. When the product will be sold out, it will immediately save the information on the cloud and will provide timely statistics regarding sales and stock records. This system will be cost effective as no need to maintain separate servers for different sites. It will help to identify areas which can assist the business to accelerate their profit and explore new business strategies. The emergence of cloud computing point of sale software will help the companies to work effectively and proactively. It has its significant importance for all type of businesses; from small retail outlets to multinational companies.

Keywords: POS System, Cloud Computing, Multinational, Inventory Management

I. INTRODUCTION

A cloud point of sale is the software designed for all type of business scenarios, from a small retail shop to multinational chains. It is a cost and time effective technique which has diverse and significant importance. It will help the business in stock and inventory management. The system will follow FIFO (first in first out) method for stock valuation. This software keeps a track and instantly saves all the business information, which includes the details of each product, suppliers and valuable information of customers. It assists the business to increase its customer relationship management. This approach will not only save the cost of heavy equipment's but also the cost of hiring IT professionals. By using this software, the business owner can have access to accurate business information and real-time view of the business [1] [2].

Cloud based POS system can be easily accessed from the web. It just requires an internet connection and laptop or touch screen tablet. It is the most advanced form of existing POS system. A user ID and password will be assigned to its user at the time of software installation. This software will facilitate restaurants, brands with multiple outlets, retail shops and supermarkets. Restaurants can get benefit from this software in a way that a waiter can take orders from the customers directly on his tablet which will simultaneously

give information to the kitchen to prepare the given order. Moreover, the total price will be computed and the bill will be generated for the customers and recorded in account system [3]. Cloud POS system will streamline the Brands that owns and manage multiple outlets. They will be able to keep a track of their sales. This software will not only guide them to strategically analyze their sales pattern in each outlet but also to expand their business in the most demanding product. This will also assist them to minimize the wastage of their resources and how to utilize it in best possible ways. This will result in overall growth and development of the entire business. This software will prove to be a successful approach for the effective management of the business [4][5].

II. LITERATURE REVIEW

A. Role of Cloud POS in the development of Business

The main objective of the business owner is to ensure the smooth running of their business, proper allocation of its resources, maximization of their profits and the ultimate growth and development of business. All of these objectives can be achieved by Cloud POS software. The sales data of customers will be stored in the system and can be viewed by the owners anytime, anywhere. This can help them to track the items that are most successful and then develop targeted marketing based on geographical area and customer

purchasing habits. By having the access of this software, retailers can easily document the data, and keep track of inventories and stocks, record sales and organize employees [6].

B. Cloud POS for Managing Business Operations

Effective administration and management is the basic concern of every business. Cloud POS (CPOS) is the customized software designed for all types of business. It will play a pivotal role in the managing and organizing business operations. This system emphasis on all aspects of management, those are as follows [7].

1) Purchase Management

The system facilitates the business to escalate purchase orders and acquire goods against invoices and deliver the goods to the desired location [8][9].

2) Inventory and Stock Management

It is the most important feature for the business that has multiple outlets. The data of stocks and inventories can be easily stored in the system. It can be viewed and accessed wherever and whenever required. The count of stocks and inventories of each outlet is monitored and can be transferred to the other outlet if required. This process can assist the management to minimize the wastage and to provide right product for right audience [9].

3) Customer Relationship Management

Efficient CRM system should also be integrated in POS software. It will be the best way to engage and retain the customers. It requires a comprehensive customer database which would include their contact details, preferences and other basic information [10][11].

C. Cloud POS for Managing Monitoring and Evaluation

CPOS system will assist the business to control its operations and overall performance. This software will keep the management updated about all its business activities, which will help them to take proactive measures and prompt decision making. The system will keep checks and balances on sales, discounts, inventories and notify when stocks are running out. [12].

D. Cloud POS for Marketing and Promotion

Cloud Point of Sale Software will assist the business to multiply the customers by its effective and efficient techniques. The system will have a feature of discount and promotion, through which the business can communicate its promotion schemes and discount offers to their customers with the help of exclusive customer data stored in the software [13][14]. Cloud based system are gaining importance in modern management tools [15] [16] and are integral to modern systems.

III. METHODOLOGY

The development methodology is that of the Agile Model, as shown in the figure 1. Firstly, the data is strategically analyzed, after its examination, feedback is taken from the clients. On the successful completion of its testing, system gets launched. If the proposal doesn't get approval, then the required modifications have to be

incorporated. The amended software again goes through the same procedure and methodology.

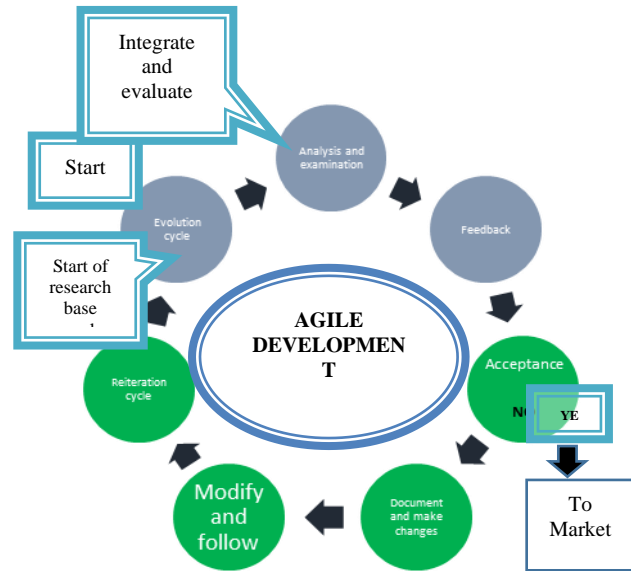


Figure.1: Agile Development

IV. IMPLEMENTATION

First, a Graphical User Interface is designed, it features a login phase. After logging into the system, the hierarchy of CPOS module will appear. It lists various modules like, setups, sales, stock, supplier and reports module. Setup module is further divided in items, customers, discounts,

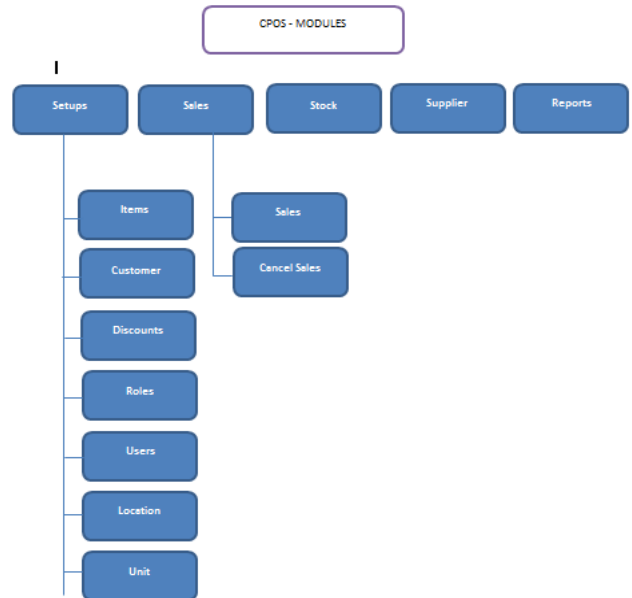


Figure.2: CPOS Module

roles, users, location and unit. Sales module will be divided in sales account and cancelled sales. The CPOS Module implemented is shown in the figure 2.0.

The Implementation process of Cloud POS system is shown in the figure 3. The first step is to purchase a domain. Then a website is hosted that would be based on Cloud POS system. After that we acquire SSL certificate to register copyrights and license. A user ID and a password will be given to its users to access this software.

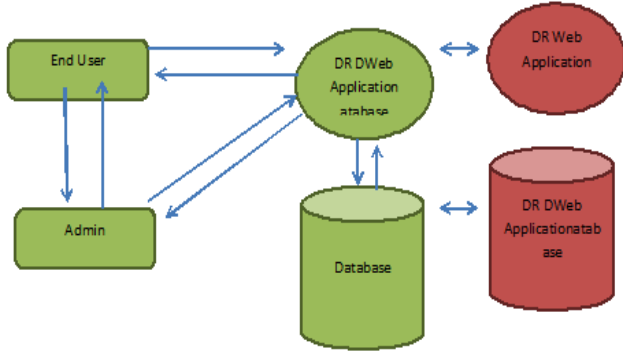


Figure. 3: Implementation Plan for Application

To access the software, a user has to browse the CPOS website and enter the user ID and password. If the credentials would be correct then the software would be accessible for the user. If not; it will show error, as shown in the flowchart shown in the figure 4. Further, we show different modules and their respective flowcharts.

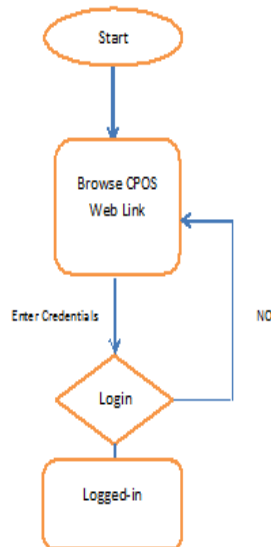


Figure.4: Flow Chart of Login Page

A. Dashboard

After the user has logged in, the Dashboard with the graph page will appear, as shown in the figure 5.

B. Unit Module Setup

The permission of Unit module setup would be checked. If yes, then the Unit set up page would appear and if no, then it would indicate error and show a blank page. It would have two options; One would be to create a new page, which will

require some key information of unit. If it would be entered correctly, then a new unit will be created. In the second option user can update or edit the data. It's flow diagram is shown in the figure 6.

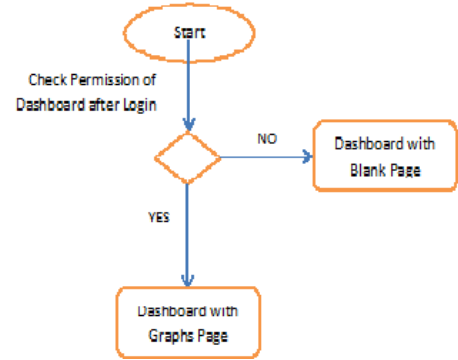


Figure 5: Dashboard Page Flow

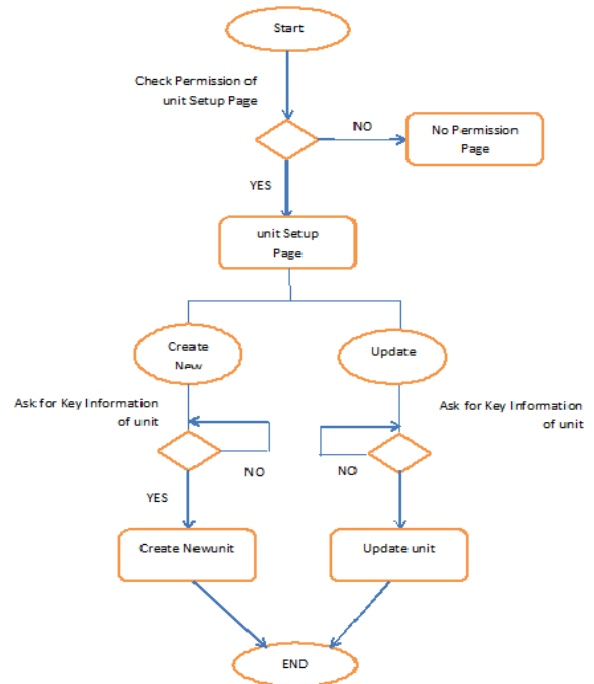


Figure 6: Unit Module Setup

C. Customer Setup

Similar to the unit module setup, the Customer setup page has two options: one to create a new page and one to update information, the relevant flow chart is shown in the figure 7. Similarly, a user can setup an Item, Location and Discount option with similar flow logic. After that user will setup the Role page.

D. Role Setup

The permission of Role setup would be checked. If yes, then the User setup page would appear and if no, then it

would show a no permission page. In a Role setup page similar to the unit module setup, we have two options: one to create a new page and one to update information, the relevant flow chart is shown in the figure 8.

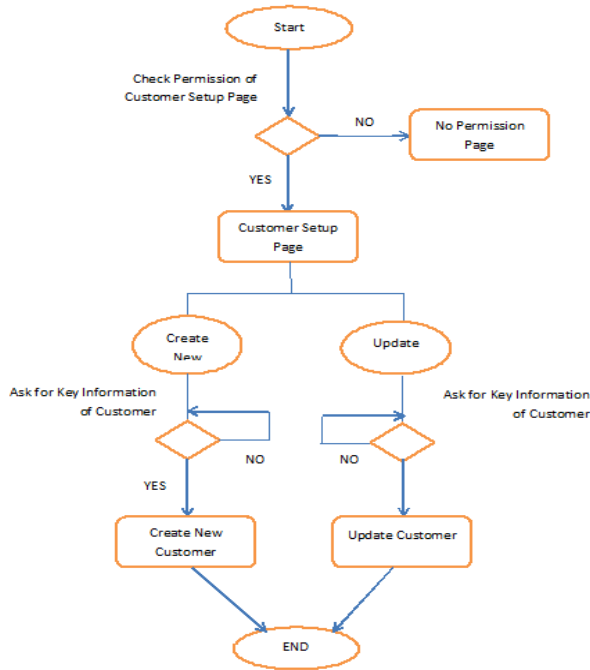


Figure 7: Customer Page Setup

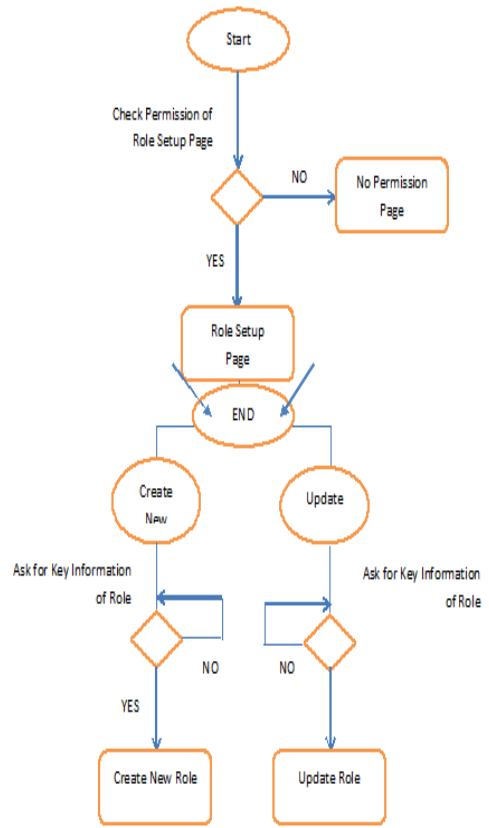


Figure 8: Role Setup page

E. Flowchart of Sale

The figure 9, shows the diagram for setting up Sales page. In it we also have two options: one to create a new page and one to update information.

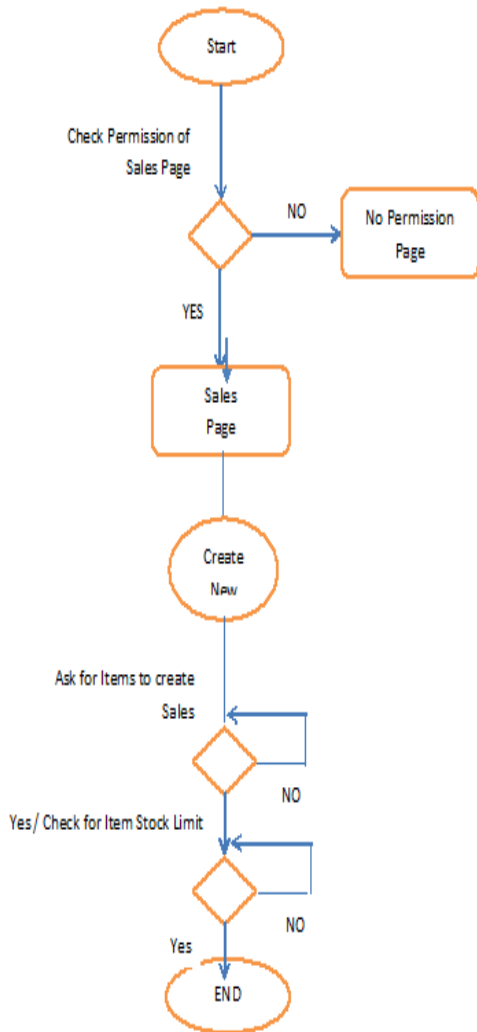


Figure 9: Sales Page setup

F. Inventory Stock and Supplier Payment

The permission of Inventory stock page would be checked. If yes, then the stock page would appear and if no, then it would show a no permission page. On a stock page, in a create option, it will ask for items to stock. If yes, then it will create stock. If no, it will indicate error. The permission of Supplier setup would be checked. If yes, then the Supplier setup page would appear and if no, then it would show a no permission page. Similarly, a supplier payment page will be set, figure 10 and figure 11 show these page setup process.

G. User Setup

Similarly, the user page setup will be done containing permissions check and also setting up of the option, as described in the figure 12. In a similar way reports page can be setup as shown in the figure 13.

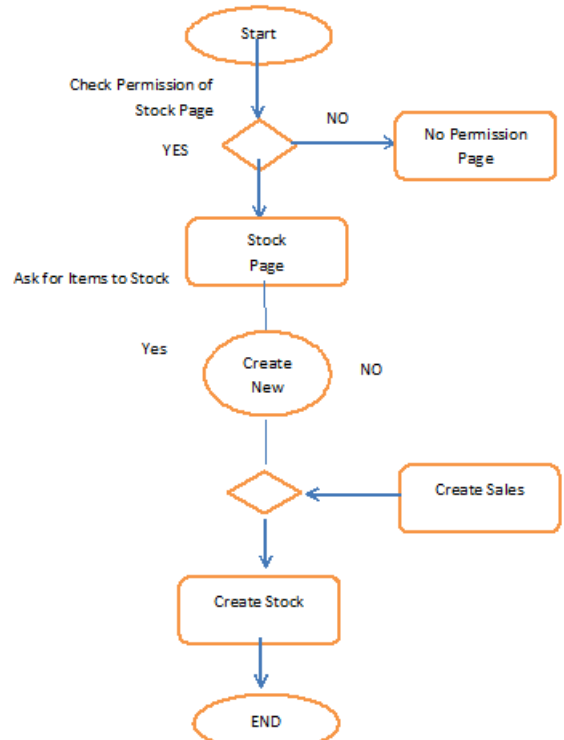


Figure 10: Inventory Stock page setup.

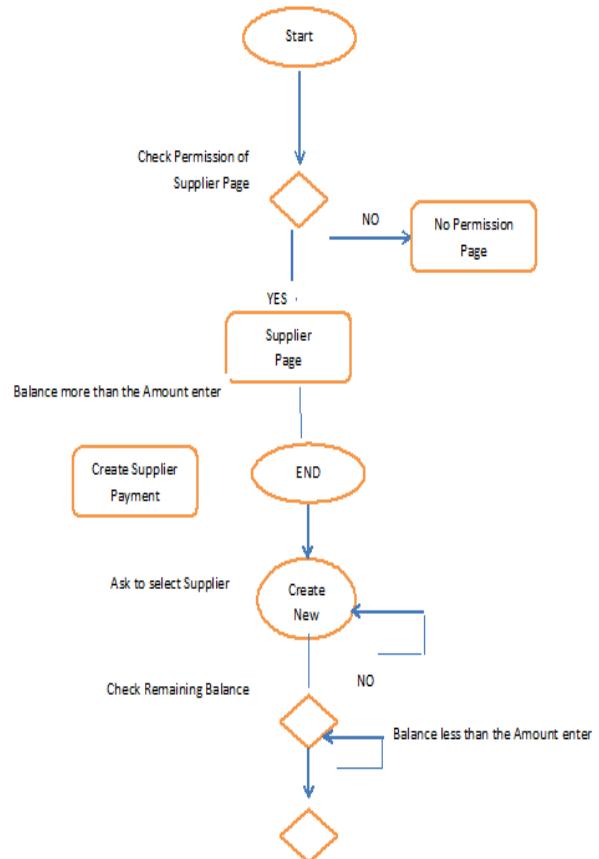


Figure 11: Supplier Payment setup.

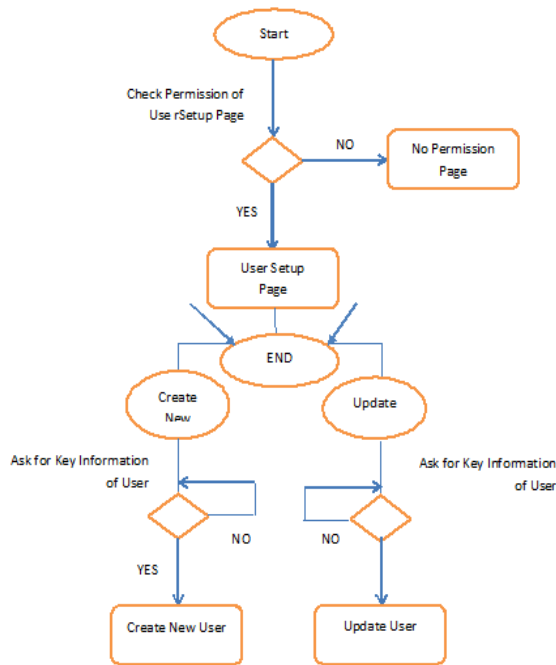


Figure 12: User setup.

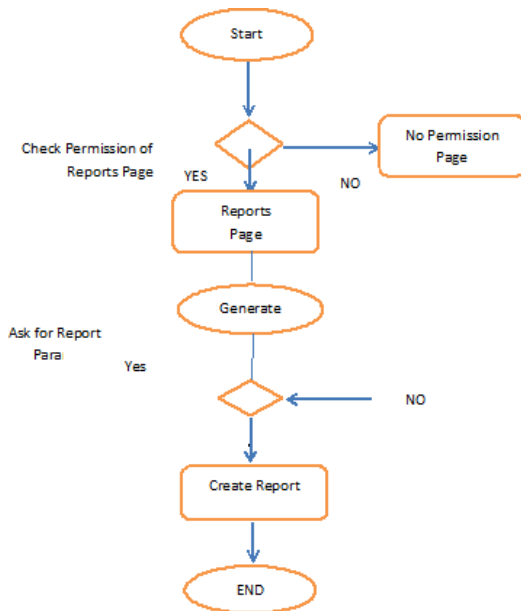


Figure 13: Reports Page setup.

V. RESULTS & DISCUSSION

Initially we surveyed existing POS system users. The respondents were asked questions that were related to the existing POS system and Cloud POS system. Most of the respondents have agreed that the current system needs modification and has some limitations. They have notified the timely up gradation charges which is the one of the main

drawback of current POS system. Their responses have demonstrated that Cloud POS will serve as the best solution to their problems. Majority of the respondents have agreed that CPOS will be a cost and time effective technique and will help them to expand their business.

The software of Cloud POS provides numerous benefits to all types of business. Existing POS system has many limitations which are resolved by Cloud POS. It is a cost effective technique that doesn't require any high equipment cost or IT professionals to operate it. Based on surveys and research, there is no brand that offers Cloud based POS in Pakistan. This system will also assist in having real-time view of business, which will lead to proactive approach and prompt decision making. Furthermore, this software will provide guidelines to the management in formulating plans and strategies for the growth and development of business. The Table 1, compares the cloud POS with the existing POS system.

Table 1: Comparison of Existing POS with Cloud based POS.

S. no	Existing POS	Cloud POS
1.	Need to buy servers and heavy equipment's.	The software of Cloud POS just requires Internet connection.
2.	Requires a lot of time and money.	Time and cost effective technique.
3.	Helps in recording data.	It helps in the overall growth and development of business.
4.	It has limited scope.	The system can be used from a small retail shop to multi chains.

VI. CONCLUSION

Cloud POS software provides a new dimension to the business. It features of real-time view that gives timely updates to the management regarding business operation, like inventory management, productivity reports, sales record. The CPOS software is a safe and secured system in which the stored information will be safeguarded. The information will be synced electronically and can be restored easily. Cloud POS is an integrated system that have addressed the core problems faced by businesses in today's competitive era. It not only ensures smooth and efficient running of the business but also provide mobility and flexibility to the business that makes it competitive. Its user needs round the clock internet connection to have an access to the software. This may create inconvenience for them.

REFERENCES

[1] Wonderflow BV, Comparison of traditional market research techniques VS consumer feedback analysis, Amsterdam, December 10th 2015, <https://www.wonderflow.co/wpcontent/uploads/2016/02/test.pdf>
 [2] Richard V. Eastin and Gary L. Arbogast, Demand and Supply Analysis: Introduction, University of Southern California (USA).

- [3] Government of Pakistan (2016). Pre-Feasibility Study (Fast Food Restaurant). Access Date January 1 2018, from <http://www.commerce.gov.pk/wp-content/uploads/2017/05/Fast-Food-Restaurant.pdf> [9]. Private Club Associates. (2016). RESTAURANT FEASIBILITY STUDY. Access Date January 1 2018, from <https://www.village-npb.org/DocumentCenter/View/1669>.
- [4] Pollay RW. More than meets the eye: on the importance of retail cigarette merchandising. *Tob Control*. 2007;16(4): 270–274. PMID:17652243
- [5] Dunlop S, Kite J, Grunseit AC, Rissel C, Perez DA, Dossaix A et al. Out of sight and out of mind? Evaluating the impact of point-of-sale tobacco display bans on smoking-related beliefs and behaviours in a sample of Australian adolescents and young adults. *Nicotine Tob Res*. 2014: 1–8
- [6] Kim AE, Nonnemaker JM, Loomis BR, Baig A, Hill E, Holloway JW. Influence of Point-of-Sale Tobacco Displays and Graphic Health Warning Signs on Adults: Evidence From a Virtual Store Experimental Study. *Am J Public Health*. 2014;104(5): 888–895. PMID:24625149
- [7] World Health Organization. WHO framework convention on tobacco control. Geneva: World Health Organization; 2005.
- [8] Scottish Government. Guidance on the display and pricing of tobacco products and smoking related products in Scotland, for tobacco retailers and Local Authority Trading Standards Officers 2013. Edinburgh: Scottish Government; 2013. Available: <http://www.gov.scot/Resource/0041/00412868.pdf>
- [9] Haw S, Amos A, Eadie D, Frank J, Macdonald L, Mackintosh AM et al. Determining the impact of smoking point of sale legislation among youth (Display) study: a protocol for an evaluation of public health policy. *BMC Public Health*. 2014;14: 251. PMID:24628879
- [10] Scottish Government Urban/Rural Classification 2013–14, November 2014 ISBN 9781784129576, <http://www.gov.scot/Resource/0046/00464780.pdf>
- [11] McNeill A, Lewis S, Quinn C, Mulcahy M, Clancy L, Hastings G et al. Evaluation of the removal of point-of-sale tobacco displays in Ireland. *Tobacco Control* 2011; 20:137–143. PMID:21088060
- [12] Quedley M, Ng B, Sapre N, Blakiston M, Crawford A, Devadas R et al. In sight, in mind: Retailer compliance with legislation on limiting retail tobacco displays. *Nicotine Tob Res*. 2008;10(8): 1347–1354. PMID:18686182
- [13] Cohen J, Planinac L, Lavack A, Robinson D, O'Connor S, Dinardo J. Changes in Retail Tobacco Promotions in a Cohort of Stores Before, During, and After a Tobacco Product Display Ban. *Am J Public Health*. 2011;101(10) 1879–1881 PMID: 21852644
- [14] Austin PC. Estimating multilevel logistic regression models when the number of clusters is low: a comparison of different statistical software procedures. *Int J Biostat*. 2010; 6(1): 16
- [15] Waqas, A., Malik, H. A. M., Karbasi, M., Nawaz, N. A., & Mahessar, A. W. (2017). CLOUDSIS: An Application of Cloud Computing for Smart School Management System. *University of Sindh Journal of Information and Communication Technology*, 1(1), 35-38.
- [16] Ahmad, T., Aslam, H., & Shahzad, S. (2018). Security of Provider sides in Data Privacy and Data Accessibility Issues in Cloud computing. *University of Sindh Journal of Information and Communication Technology*, 2(1), 7-10.