Digital Receipts: A Viable Replacement For The Printed Receipts on Thermal Papers

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Abstract:
The business done with help of Information Technology helps reducing manual work and gives high returns. Here we discuss about the prevailing billing system and how to incorporate the Digital Receipt system in the present scenario. We here discuss four specific ways to implement digital receipts. The Bluetooth, available in most mobile phones and customer gets receipts on the spot. The SMS/MMS service can be used to deliver the receipt in the SMS format of in image type via MMS. The E-mail could be sent to the customers Id with the receipt attached in PDF or image format. The receipt in any format could also be shared over the cloud. These ways to implement the digitalization are discussed in the sections later in detail. The main advantage of the digital receipts is to reduce the use of Paper in this day by day degrading environment. Also this reduces the regular cost of paper rolls involved in billing for the company. The customers get a safe and long lasting receipt. Advantages of implementation of digital receipts have also been mentioned of in the sections later.

Key words: digital, billing, receipt making, Bluetooth, Cloud Computing, SMS, MMS

1. Introduction

The world is made such that when we buy some goods/products/services we always expect a proof of purchase. The proof of purchase, the Receipt is a very useful piece of paper that serves many purposes in life. The daily cash transfer for the buyer, the sales tracking for the seller and after sales service for the product. The world is moving fast towards the globalization, urbanization, so is towards the new and modern ways of Billing and accounting in Businesses. This paper describes the new way of Receipt generation, a change in the long followed printed receipts. The most common way of receipt is a Cash memo, made in hand, authorized by the owner. Through the advancements in technology, and its use in business, the new way followed is Printed receipt. Among printed receipts we here would like to take into consideration, the ones on the Rolls (any

paper roll like Thermal rolls[1] used widely today). These rolls are used in cash registers, adding machines, ATM machines etc. Here we'll talk about the rolls used for Cash Registers(billing) [2].The cash registers now are the modern day cash registers that use a Thermal Paper (some use normal paper rolls). Estimating the total paper usage for the Receipt purpose is at high cost to the environment. Here we talk about the alternative receipt making system.

As we go to a Super Store (or nowadays even the local shops in metros) the products we buy are billed through the cash registers and the receipt we get is not of use for many of us customers considering the Cost of it to the Environment. And if we do consider that it is of importance to the customer, then it is a difficult task to keep the receipt safe for a long period of time. The Alternative method of providing receipt we are to talk about is the Digital Receipt making.

There are a few different ways of implementing this system into the prevailing Cash register system. These are discussed in section II and its subsections .The section III talks of how to go about implementing digital receipts. And the section IV is about the advantages of the Digital receipt considering all the aspects of Business Studies and Information Technology. Table 1 in section V discusses comparatively the different techniques of implementing Digital receipts. Finally we conclude the paper in section VI.

2. Implementation

The cash registers are made such that they keep record of the products in the store and the products are bar coded. The customer selects various products, there barcode is read on the product and billed. The bill is then printed on the paper roll. Instead of the print we suggest the Image of the bill be created and provided to the customer through any of the four under mentioned techniques.

Considering the Mobile phones, a device that's become part and parcel of the life of people nowadays and so will the customer at any shop/store shall have his/her mobile phone with himself/herself. Depending on the various functionality variations we have many ways to deliver the receipt to the customer.

2.1. Via Bluetooth

The Bluetooth is found in any Smartphone (common like sunglasses in present world) or any normal Mobile phone [3]. The bill generated could be generated in the form of Mobile phone compatible image. The cash registers in the new modern world with increasing number of functionalities can easily be provided with Bluetooth on it. The customer giving order is very normal to carry a mobile phone that includes the Bluetooth functionality very well available in it. Upon billing the customer shall just provide with his Bluetooth device's (mobile) name so that the bill's image could be sent to the customer's device. The very easy and convenient method provides the customer with the long lasting format of receipt. This method doesn't involve much of cost as it would only require a Bluetooth functionality to be added to the cash registers and a program to make image of any receipt that's all.

2.2. Via SMS/MMS

There is another method that can act as a viable medium of delivering the receipts. Almost all the mobile models support the images (jpg etc.). If the customer agrees to use the SMS/MMS option he shall provide the Cell Number on which he is to get the receipt. As image included in the message makes it a MMS, and in most mobile phones, MMS service is blocked by default, we need to either ask the customer to either start his MMS service or choose other option. Though customers can receive many of the general receipts in the form of SMS (Intimation of order status is nowadays made also of and total bill amount etc.), like the one step towards making Ticketing completely E based, they've brought about changes in their Ticket checking rules and successfully incorporated the E-Ticketing saving 8 lakh pages a day [4]. The saving of paper could be unimaginable if the superstore chains implement the digital receipt system.

2.3. Via Email

The customer can also be provided with the option of receiving the receipt on his/her E-mail Id. The option of E-mail is very much viable and is used by the online billers and online service providers. In the today's world full of Internet six people on ten people in cities have at least an e-mail id. So if the customer feels comfortable with the option he/she shall receive their receipt through e-mail. This option only needs an E-mail server to be set up for the store so as to send auto generated e-mails. This option could be set a compulsory option and any one of the other should also be chosen as email is safely kept on the internet as long as the account's owner wishes to keep it. So the receipt will be very safely kept and that to at very minimum cost.

2.4. Via Cloud

The fast growing use of the cloud in today's world has led to shift to various services to be on cloud, and also Smartphone users, more advanced computer users have also started using the Cloud Services to a great extent [5]. We don't doubt that in the coming world the cloud would be the next level of development and most of the services shall be provided and used on cloud. Taking into consideration this widespread use of the cloud and ever increasing need and use of it, we here also have an easy way to provide the customers with the digital receipt of their products/services bought. The customer upon billing out of many options can choose the Receipt via Cloud option where he just needs to provide his username if the vendor and the customer share the same cloud provider, else the e-mail id through which the digital copy of the receipt shall be shared with that email-id provided.

The cost involved in making this option working is that of the space on the cloud that could be very much feasible in the business as many business firms have already started use of the cloud on large scale.

3. How To Implement?

At the billing counter the cashier upon billing all the products, shall make one click and all the options may appear on screen. The customer can choose the option that is best for him (among the one enlisted above) and should provide the cashier with the necessary details required. Upon which the customer shall be delivered his Digital Receipt instead of the Printed paper, which might be of no use for the customer in the printed format. The format of the receipt could be anything, a PDF files, an image etc. The format should be such that it could be unaltered by the customer by any means and remains a viable proof of purchase. Policy of sales and the service shall be made such that the customers don't face any problems regarding the receipts in future. A simple implementation is represented in the figure 1 below.

4. Advantages of Digital Receipts

The system of Digital Billing if bought into practice shall have considerable advantages:

- The Environmental impact: if the method of billing is made digital, then the huge amount of paper would be saved. As usually the Thermal rolls are used nowadays and these rolls are not made from the recycled paper and are not reusable too. So, if we replace the paper rolls with the above discussed receipts' system we would be able to save a large amount of trees. It shall help the environment.

- Long life: From the customer point of view, the very much important aim towards the receipt is that, the receipt be kept safe and for long. One maintains a file/collection of all the bills and receipt for future presentation or so. So if kept digitally the receipt are much safer and long living than the usual printed ones.
- For business firms: The firms shall have no problem regarding the digitalization of the receipts. As the work goes on with the printed ones, so does with the digital ones. No high cost investment required. Beneficial and safe for both the customer and the firm too.
- Cost effective: Making the digitalization of the receipts possible is not a very cumbersome task. It reduces the cost of paper rolls and making these various methods of digital billing are almost one time investment only.
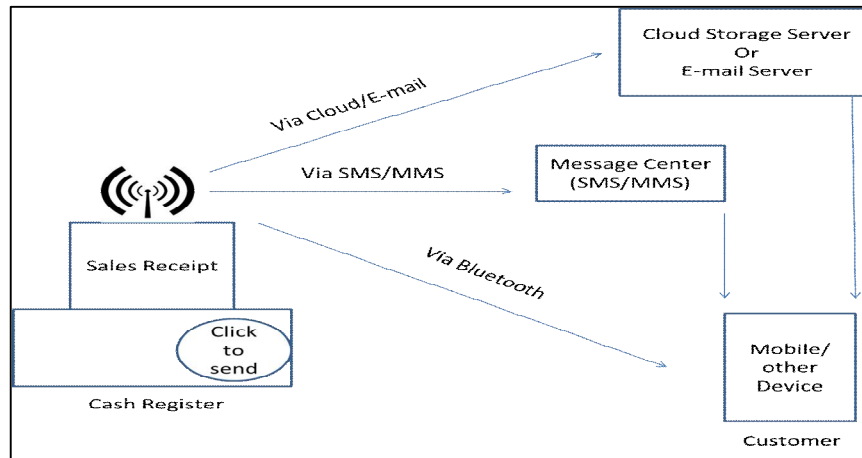

Figure1: Implementation Diagram of the Digital Receipt System

5. Comparative Study

	Bluetooth	**SMS/MMS**	**E-Mail**	**Cloud**
Requirements: Customer	The customers' mobile/device should have Bluetooth device attached	The customers' mobile/device should have the service of receiving SMS/MMS enabled	The customer must have an E-Mail account that is trustworthy enough and activated.	The Customer just needs to have an E-Mail Id or shall have username of the same cloud provider as of the shop.
Requirements: Business	A Bluetooth service available in the cash registers	Messaging service should be available at the cash registers	An E-mail server to send emails to the customers	The Cloud storage be bought by the company.
Advantages	The customer gets the digital receipt on the spot and in his hands	The customer gets the receipt on the device he/she wishes to through the cell number provided	The customer shall receive the receipt on his E-Mail that shall be safely kept for long time on the Mail Server.	The receipt could be easily shared with the E-mail Id provided by the customer over the cloud. Beneficial for both the customer and the firm.

Table 1: Comparison between the Different Ways of Implementing the Digital Receipts

6. Conclusion

Through this paper we conclude that the digital receipts could be a viable replacement of the printed paper receipts used at present by the billers. The digital receipts save time & money of both the customers and the company too. The main advantage is its positive impact on the environment as it reduces the use of paper on a large scale. As from a cord of tree, manufacturers produce 2,700 copies of a 35 page newspaper [6].Almost if a single chain of stores nationwide implements this, a tree could be saved a day and will help the environment and will secure our future. Also the customers will be worry free with the state Receipts as in the paper, it may get spoilt under any possible circumstances. So the Digital receipts are profitable for all, Business firms, customers and the environment. Also in the conditions where any of the IT options mentioned in the paper above of receiving the receipts the customer can simply get a printed receipt as the default functionality of the cash register includes printing machine, but this shall only be used in genuine case like customer not having Bluetooth mobile and doesn't have Email or doesn't even have a cell phone etc.. in cases like these a printed

receipt shall only be feasible option. Though we are talking of superstore chains where these situations are only one or two in a thousand or so. Hence digital receipts could be incorporated in the billing system of modern business techniques.

7. References

1. Fukazawa h, H. K.; Hoshino, K.; Shiozawa, T.; Matsushita, H.; Terao, Y. (2001). "Identification and quantification of chlorinated bisphenol a in wastewater from wastepaper recycling plants". Chemosphere44 (5): 973–979. doi:10.1016/S0045-6535(00)00507-5. PMID 11513431
2. Brat, Ilan; Zimmerman, Ann (2 September 2009). "Tale of the Tape: Retailers Take Receipts to Great Lengths". Wall Street Journal. p. A1. Retrieved 2009-09-02
3. "IEEE IEEE 802.15 WPAN Task Group 1 (TG1)". official web site. IEEE Standards Association. February 9, 2004. Retrieved June 30, 2011.2.
4. IRCTC, www.irctc.co.in, use VRM/SMS to travel in trains.
5. "The NIST Definition of Cloud Computing". National Institute of Standards and Technology. Retrieved 24 July 2011.
6. Boise Cascade Corporation, http://www.bc.com/index.html