

INFORMATION COMMUNICATION TECHNOLOGY: A TOOL FOR EFFICIENT POSTPAID BILLING SYSTEM IN NIGERIAN TELECOMMUNICATIONS INDUSTRY

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Abstract

Before the introduction of the Global System for Mobile Communications (GSM) in 2001, the only communications company operating as a national carrier was the Nigerian Telecommunications Limited (Nitel). In the present, Nitel is going moribund and some of the problems attributed to this death are not unconnected with its billing system (Postpaid). In this paper, some proposal on changing and improving some of the billing processes were highlighted using the advancement in Information Communication Technology (ICT).

Keywords: Telecommunication, prepaid and postpaid billing, Call Detail Records (CDR)

Introduction

Postpaid billing as the most predominant billing platform before the introduction of the GSM in 2001 has been having a lot of problems in the Nigerian Telecommunications Limited. Some of the problems include wrong posting of payments, non posted payments, and over-billing among others (Garko and Tijjani, 2009).

Apart from these problems, huge amount of money is spent on printing and distribution of bills to customers at the end of every billing cycle. These problems have contributed to the comatose condition of Nitel.

For many years, even before the introduction of the mobile communications in Nigeria, there were many problems associated with Nitel (Nigerian Telecommunications Ltd), which was the only telephone operator in the country. Most of the problems then were from the billing aspect of the company. The subscribers' complaints included wrong posting of their payments, over billing and other problems associated with the connectivity.

The objective in the paper is to explore the diverse problems associated with the postpaid billing system and propose a practical solution.

Related works

Ou et al., (2007) address some of the billing problems in mobile communication technologies from the roaming aspect for a customer that travels out of his home network. A proposal was designed for the other network to charge and bill the customer instead of billing the customer's home network that would solve the problem or dispute between the customer and his home network service provider. The customer after having access to the roaming facility, the network that provides that services should charge and bill the customer for the services s/he enjoys. However, Ou et al., (2007) only focus their research on mobile communication technologies, the landline or fixed networks are not mentioned.

Many billing problems were also highlighted by Garko and Tijjani (2009). Stratus (2010) in one of their product called Emerging Networks Telecommunications Infrastructure

Control Environment (ENTICE) proposes a solution to some of the billing in telecommunications. ENTICE combines order processing, service activation, account management and customer support with real-time authentication and rating to create all-in-one solution for prepaid/postpaid applications. What ENTICE is doing is just like a convergent billing system by combining the postpaid and prepaid applications in one place.

Mills (2002) observed that it is very common for telecommunication companies to loose from 5% to 15% of total revenue per year, if care is not taken on the revenue leakages. Mills (2002) highlighted many problems among which he mentioned fraud.

Methodology

Normal software development methodology (Pressman, 2005) was followed in coming up with a working prototype of the proposed billing system. Unified Modeling Language (UML) was used as a design tool.

Analysis of the Postpaid System

The procedure can be shown diagrammatically as:

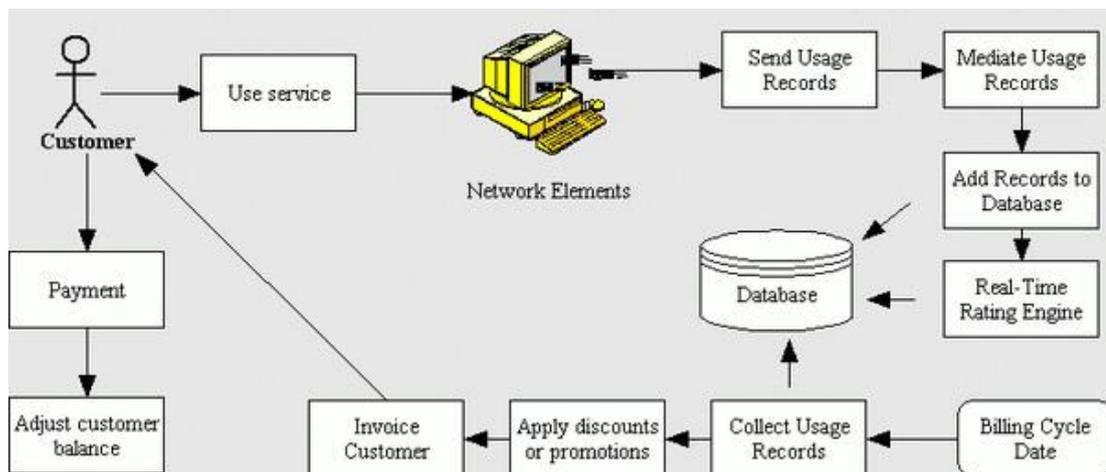


Figure 1: Diagram showing the Postpaid Billing Procedure (Source: Hatem, 2005)

According to (Garko, 2008; and Garko and Tijjani, 2009) the postpaid billing procedure can be outlined as follows:

1. There is too much paper work involved, which will consequently cost the telecommunication company.
2. Fraud would be prevalent as too many people are involved in the process.
3. Efficiency would also be less, as some personnel may introduce unnecessary delay.
4. Payment made by the customer may be delayed before capturing in the billing system; this is due to following long protocol.
5. Payments might be captured wrongly. For example, by typing wrong account number, since it is not the customer who is crediting his account directly
6. Whenever there is fault in the subscribers' line, it takes longer time than necessary before his problem is solved due to corruption.
7. Considering the procedure, definitely, there are lots of revenue leakages from inception to the bill distribution.

Therefore, there is no revenue assurance in the system

8. There is always a problem when it comes to reconciliation between the customer service center and billing department, for the payments made by the subscribers
9. Delay in bills distribution, as customers are served with their bills by dispatch riders.

System design

Stephen (1996) stressed that, starting with the specification (problem definition) document, the designer determines the internal structure of the product. Also during the design phase, algorithms are selected and data structures chosen. The inputs to and outputs from the product are laid down in the specifications, as are all other external aspects of the product.

In this case, the product is the Postpaid Billing Software. This has to be decomposed into various modules, so as to ease the work.

In a related topic, Williams and Sawyer (1999) called the system design phase of software development a Detail Design Phase.

Design of the proposed system

What is followed is the suggestion made by Pressman (2005) that the design should be modular. Hence, the Postpaid Billing Software is broken down into various independent modules that are communicating from time to time to realize a common goal. That is, the way customers enjoy services offered in a telecommunication company, and settle their bills in a way and manner operated in both the prepaid and postpaid environments.

System design modeling

In order to achieve the goal of modeling the system design, the unified modeling language (UML) is employed. The UML is a language that provides the necessary technology to support Object-Oriented Software Engineering practice.

Postpaid Billing Software

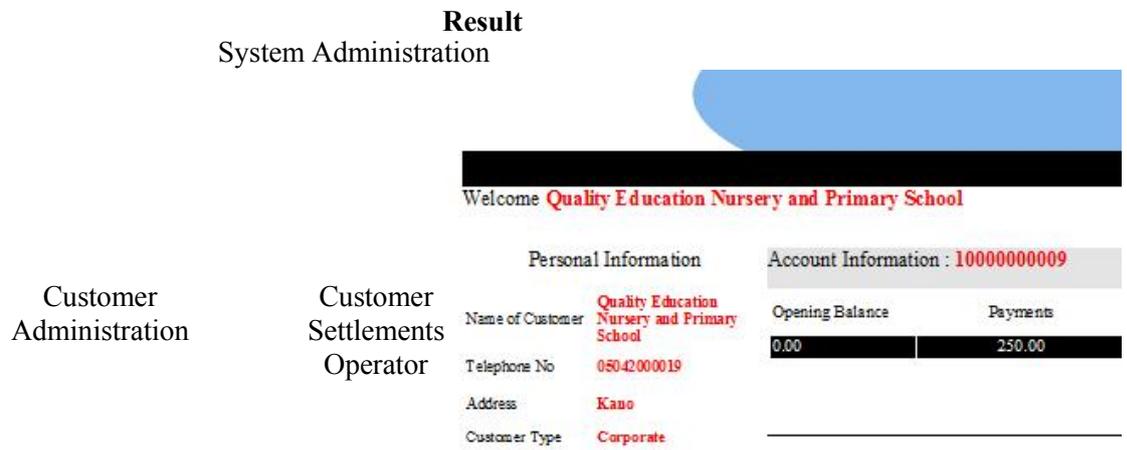


Fig. 3: Diagram showing some results from the new Postpaid Billing System

Billing Administration

Management Reporting

Stop No **Again ?** Yes

Fig. 2: Activity Diagram for the entire Postpaid Billing System

personal account; customer can effectively manage his account.

Discussion

The prototype was designed and implemented and found to be very efficient as it eliminates the need for dispatch riders that normally takes customers several days without getting their bills. The reports eliminated the paper work thereby minimizing expenditure from the point of view of the Service Providers. The customer needs not to go to the customer service center to collect his/her bill(s); the customer can simply log on to the internet and view his/her bill(s). The quality is also very good as there is no need to print a hard copy, the soft copy can be seen on screen directly, eliminating any chance of making mistake as a result of printing. Another important aspect of the Postpaid Billing Software is providing the customer with access to

Conclusion

This paper proposes a framework for the Design of an efficient Postpaid Billing Software for the Nigerian Telecommunication Industry. The result obtained from the implementation of the design are encouraging and promising for development of more complex software in the future. The current postpaid billing platform in telecommunications systems consumes huge amount of money to manage and also with numerous problems like inefficiency in some of the processes like bills dispatch. The work in this paper when properly implemented will improve the system's efficiency and also reduce cost by making the process paperless. By minimizing expenditure and maximizing revenue our own Nitel can be revived.

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