

**CUSTOMER MANAGEMENT SOLUTIONS FOR  
VOICE OVER INTERNET PROTOCOL (VOIP) SERVICE**

**VERONICA BINTI CLEMENT BUYUT**

**UNIVERSITI TEKNOLOGI MALAYSIA**

## ABSTRACT

Voice over Internet Protocol (VoIP) is a family of technologies that enable voice communications using IP networks like the Internet. Inventive developers and entrepreneurs have created an industry around VoIP technology in its many forms: desktop applications, telephone services, and corporate phone systems. VoIP is the core technology that drives everything from voice-chat software loaded on a computer to full-blown IP-based telecommunications networks in large corporations. VoIP is a single technology investment with many revenue streams according to many business analysts. To the enterprise network engineer, it's a way to simplify the corporate network and improve the telephony experience for users of the network. To the home user, it's an alternative way to save money on the old phone bill. Due to the high potential of VoIP in generating revenues, small and medium enterprises (SMEs) begin to embark in setting up their own VoIP business. However, most of these enterprises do not have proper customer management solutions which enable them to better manage their customers besides equipping the business with billing solutions that is crucial to the business. This is where this project comes in; to help SMEs in VoIP Services business to have a customer management solutions as a value-added service to their customers and also as a management tool for them to better manage their customers and business. Evolutionary prototyping has been selected as the system development methodology for this project. The system is built using PHP 5.0; MySQL as the Database Management System and Microsoft Windows XP Professional as the operating system. This project has come out with a Customer Management Solutions for Voice Over Internet Protocol (VoIP) Services. It is hoped that this project can provide benefits to the SMEs of VoIP business.

## ABSTRAK

*Voice over Internet Protocol (VoIP)* merupakan salah satu teknologi yang membolehkan komunikasi suara menggunakan rangkaian Protokol Antara Rangkaian seperti Internet. Pembangun aplikasi yang kreatif dan inventif serta usahawan telah membuka industri baru di sekitar teknologi VoIP dalam pelbagai bentuk seperti aplikasi komputer, perkhidmatan telefon dan sistem telefon korporat. Bagi para jurutera rangkaian perusahaan, ia merupakan salah satu cara untuk memudahkan rangkaian korporat disamping meningkatkan mutu kualiti penggunaan telefon. Bagi pengguna domestik di rumah, VoIP merupakan salah satu cara yang paling baik untuk menjimatkan wang dan mengurangkan kos bil telefon. Memandangkan VoIP mempunyai potensi yang tinggi di dalam menjana keuntungan, banyak usahawan kecil dan sederhana memilih VoIP sebagai pilihan perniagaan. Walau bagaimanapun, kebanyakan daripada usahawan-usahawan terbabit tidak mempunyai sistem pengurusan pelanggan yang baik dan sesuai dimana ia adalah penting untuk membantu para usahawan untuk menguruskan pelanggan-pelanggan mereka. Disinilah projek ini muncul untuk membantu usahawan kecil dan sederhana di dalam perniagaan VoIP supaya mempunyai sistem pengurusan pelanggan sebagai khidmat tambah-nilai untuk pelanggan mereka disamping berperanan sebagai alat pengurusan bagi mereka untuk mengurus pelanggan dan perniagaan mereka dengan lebih baik. Projek ini dibangunkan berasaskan metodologi pembangunan sistem evolusi prototaip. Sistem dibangunkan dengan menggunakann PHP 5.0; MySQL sebagai sistem pangkalan data dan Microsoft Windows XP Professional sebagai sistem pengoperasian. Projek ini telah menghasilkan prototaip Sistem Pengurusan Pelanggan untuk Perkhidmatan VoIP. Projek ini diharap dapat memberi manfaat kepada pengusaha kecil dan sederhana perniagaan VoIP.

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## **CHAPTER 1**

### **PROJECT OVERVIEW**

#### **1.1 Introduction**

VoIP stands for Voice over Internet Protocol or normally known as Internet Telephony. It is a technology for making phone calls using Internet Protocol. It is already being embraced by carriers as a way to cut traffic costs on international and long distance calls. It is also expected eventually to replace the public switched telephone network (PSTN). It is for now typically promise buyers of telephone service a smaller phone bill, virtually wiping out charges for long distance and international calls.

As popularity of VoIP grows among consumers, so does it among business people. Many companies have started their own VoIP Service business, and they are from different backgrounds. Some are with IT backgrounds, and some are not. And the problem normally comes from companies who are not an IT-based company, but would like to be a VoIP service provider, knowing that it has high earning potential.



## 1.2 Problem Background

VoIP comprises of two major parts; technical part and management part. Technical part involves tasks such as setting up servers, managing servers and setting up networks for VoIP implementation. The second part involves tasks such as customer management, credit management, and Call Data Record management, and this is where this project comes in. It aims to solve the problem faced by very-technical-based companies that are able to setup their own VoIP service, but has no expertise in developing a system to manage the service. It also targets small companies who are embarking in the VoIP business through a big carrier or wholesales provider, but the small companies do not have a proper system to manage their service.

One of the most popular business models in VoIP business is reselling services. Most VoIP Wholesale Provider provides the service for customers to become a reseller of their service using their own private label. Most of the resellers are taking this advantage to generate revenue by becoming the middleman to the VoIP Wholesale Provider. Reseller will search for customers, and once found, reseller will sign up for an account on behalf of the customer with VoIP Wholesale Provider, and will handle everything on behalf of the customer. Customer does not have direct access to the account, and has no idea that they are actually subscribing to a different provider instead of directly to the Reseller. One major weakness among Reseller is they do not have proper customer management solutions to manage their business. The development of this system will be able to cater for the high demand for a VoIP management and billing solutions among small-to-medium sized VoIP service provider. Table 1.1 shows the identified problem with the current system.

**Table 1.1 : Identified Problems with the Existing System**

<b>Problems with existing system</b>
1. Customer has no web access to view their account.
2. Customer has to wait for payment to be sent by Reseller to VoIP Wholesale provider before payment will be credited to customer's account.
3. Customer has to send request to Reseller to view Call Detail Records.
4. Customer has to send request to Reseller to update their account profile.
5. Customer experiences downtime due to delay in activating or updating customer's account credit.
6. Customer is not able to set their account's credit limit.
7. Reseller has no ability to mark up their price list.
8. Reseller has no ability to control fraudulent calls.
9. Reseller has to log in to customer's account on Wholesale Provider website one by one to view customer's usage, call volume, credit balance and expenditure.
10. Reseller has to do redundant task to manage different customers' accounts via VoIP Wholesale Provider website.

### **1.3 Problem Statement**

There are many small businesses that are providing VoIP services and they are of different visions and missions. Realizing the fact that target market is from various backgrounds, the following research questions have been derived:

1. How to develop a system that would meet the requirements of different users?
2. How to develop a system that would fully benefit the VoIP business provider?
3. Will the system be able to contribute in maximizing the profitability of the VoIP business?

## **1.4 Project Objectives**

There are a few objectives of this project that has been identified which are as the following:

1. To study different solutions for Customer Management Solutions in VoIP.
2. To build a prototype of a Customer Management Solutions for VoIP Service.
3. To build a system that allows customers to access and manage their online accounts: e.g. credit management, Call Detail Record management and account management.
4. To build a system that allows administrators to access and manage customer's online accounts: e.g. customer management, credit management, Call Detail Record management, price list management, fraud control, account registrations.
5. To propose strategic implementations and organizational strategy for SMEs in using the proposed system.

## **1.5 Project Scope**

The project scopes that have been identified are as follows:

1. The system will be a web-based system.
2. The system will use a client-server based database.
3. The system will use test data to simulate real data in making data access, data analysis and implementation of the system.
4. The system will focus on VoIP termination service only.
5. Main users of the systems are administrator of the VoIP termination provider and their customers.

## **1.6 Importance of Project**

This system will benefit VoIP businesses ranging from small to medium enterprises. It will be their main business tools that will enable them to monitor their business and manage their customers and focus on providing reliable service. This system will also allow them to run their business around the clock which will definitely contribute in maximizing profitability.

The proposed system has significant functions that will benefit the business. Immediate account activation upon payment makes it convenient for customer and business owner without having the need to wait for account activation, which actually contributes to down time on behalf of the customer. Besides, business owner is also able to view customer call volumes, expenditure and usage and perform certain analysis on the business to further improve the business performance. Functions such as fraud control are also beneficial and important in order to control fraudulent cases that are rather inevitable when dealing with online payment. Companies could end up losing thousands of dollars to fraud cases, and this could have been minimized with the implementation of certain control and monitoring.

## **1.7 Chapter Summary**

VoIP Management & Billing System will meet the demand of many companies who wish to have an automated system to manage their VoIP termination business. Analysis, objectives and the importance of the current system has been identified in making sure that the system that will be built will achieve the main objective as what has been expected. The scopes have also been identified so that the project will meet the requirements that have been stated.

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