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AN INTEGRATED VOICE MESSENGER SYSTEM IN KUTKM

MUHAMAD HAWARI BIN KAMARUL ZAMAN

This report is submitted in partial fulfillment of the requirements for the
Bachelor of Information and Communication Technology (Computer Network)

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY

KOLEJ UNIVERSITI TEKNIKAL KEBANGSAAN MALAYSIA

2004

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ABSTRACT

The main goal of this project is to design for fulfilling a condition set to qualify a Bachelor of Information Technology and Communication. The concept KUTKM's Messenger is the same like the Voice over Internet Protocol (VOIP) technology. This system will bring data in voice and text via IP. The objective and scope on developing a KUTKM's Messenger is to upgrade the communication in KUTKM on LAN (Local Area Network) environment and easier for user to send/receive data/file on LAN environment only. The methodology during develop this utility is referred to the waterfall method that one of the SDLC. This method is use because it has a suitable phase that match with the PSM timeline and the system requirement to be developed. The software requirement is to develop on Microsoft Visual C++. Each student must complete PSM 1 before continuing with PSM 2. Students must give out the purpose project in this report as set the idea how to develop the real project in PSM 2. In PSM 2, students will develop a real project such as was proposed in PSM 1. PSM 2 is a project challenging which it will determine whether a successful project and usage testing will be done to define it will fulfill user's requirement. The usage this application does not means the current technology is not expedient any more in organization; it is just an alternative in communication.

ABSTRAK

Matlamat utama projek ini adalah untuk memenuhi syarat kelayakan bagi pengijazahan kursus Ijazah Sarjana Muda Teknologi Maklumat dan Komunikasi (Rangkaian Komputer) (BITC). Konsep yang diperkenalkan dalam KUTKM's Messenger sama seperti Voice over Internet Protocol (VOIP) technology. Sistem ini akan memaparkan data dalam bentuk medium suara dan juga melalui IP. Objektif dan skop terhadap KUTKM's Messenger adalah untuk meningkatkan konsep perhubungan di dalam KUTKM melalui persekitaran LAN (Local Area Network) dan memudahkan pengguna untuk menghantar/menerima data/fail melalui persekitaran LAN sahaja. Kaedah kajian semasa membangun kemudahan ini merujuk kepada kaedah Model air terjun yang digunakan didalam SDLC. Kaedah ini dipratikkan kerana mempunyai fasa yang bersesuaian dan serasi dengan garis panduan yang telah ditetapkan di dalam PSM dan keperluan pembangunan sistem. Perisian Microsoft Visual C++ digunakan bagi tujuan pembangunan sistem. Setiap pelajar dikehendaki mengambil PSM 1 sebelum lulus untuk menyambung PSM 2. Pelajar juga hendaklah menyertakan sebab utama pemilihan projek di dalam laporan yang hendak diserahkan kepada pihak fakulti, dimana laporan ini menwakili idea para pelajar terhadap projek yang sebenar didalam PSM 2. sememangnya PSM 2 merupakan satu projek yang benar-benar menduga kewibawaan para pelajar IT. Kejayaan projek ini dapat dilihat sekiranya ianya dapat beroperasi disamping memenuhi keperluan pengguna. Aplikasi projek ini tidak bermaksud teknologi pada masa kini tidak beroperasi dengan baik tetapi ianya hanya sebagai alternatif lain dalam dunia komunikasi.

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ABBREVIATION

ASCII	-	American Standard Code for Information
DC	-	Direct Current
Dos	-	Denial Of Service
HTTP	-	Hyper Text Transfer Protocol
IBM	-	International Business Machine
ICMP	-	Internet Control Message Protocol
ICT	-	Information Communication Technology Interchange
IP	-	Internet Protocol
IRC	-	Internet Relay Chat
IT	-	Information Technology
ITU	-	International Telecommunications Union
KUTKM	-	Kolej Universiti Teknikal Kebangsaan Malaysia
LAN	-	Local Area Network
NIC	-	Network Interface Card
PC	-	Personal Computer
POS	-	Packet Over Sonet
PSM	-	Projek Sarjana Muda
PSTN	-	Public Switched Telephone Network
PT	-	Performance Testing
QoS	-	Quality of Service
RTP	-	Real-time Transport Protocol
SCR	-	System Change Request
SDLC	-	System Development Life Cycle
SIP	-	Session Initiation Protocol
SMTP	-	Single Mail Transfer Protocol

TCP	-	Transmission Communication Protocol
UAT	-	User Acceptance Testing
VLAN	-	Virtual Local Area Network
VoIP	-	Voice over Internet Protocol
WAN	-	Wide Area Network
WAVE	-	Waveform

LIST OF APPENDIX

CHAPTER 1

INTRODUCTION

1.1   Introduction of the Project

KUTKM's Messenger that is, voice chat delivered using the Internet Protocol is a term used in IP telephony for a set of facilities for managing the delivery of voice information using the Internet Protocol (IP). In general, this means sending voice information in digital form in discrete packets rather than in the traditional circuit-committed protocols of the public switched telephone network (PSTN). A major advantage of KUTKM's Messenger is that can voice chat on LAN environment, can sending and receive data and it avoids the tolls charged by ordinary telephone service.

KUTKM's Messenger controls are made especially for developers that want to enable their application for voice conversation over the multiple connections, without the need of any Voice Server. Everybody begins to use PCs and Internet for job and free time to communicate each other, to exchange data (like images, sounds, documents) and, sometimes, to talk each other using applications like Yahoo Messenger or Internet Phone. Particularly starts to diffusing a common idea that could be the future and that can allow real-time vocal communication.

This technology is to change the currently communication between users by using telephone line to the IP address. This project is providing a KUTKM's Messenger technology that can be use on LAN (Local Area Network) communication and also can be implemented to the office environment. This project also to propose the new technology of LAN communication to the users especially for LAN environment. The

purpose of this project is too made easier for users to voice chat anyone on LAN environment and can easier to transfer data and saving cost for LAN communication without using a telephone line.

As we know, LAN environment especially for data and voice communication are using a telephone line. This situation are involved a telephone billing and increase cost for one organization. Perhaps they needed more efficient technology that can reduce their cost for telephone billing.

In the new era of information technology many users are using computer to sending and received the data. KUTKM's Messenger is the one technology that can be implementing to the communication includes the voice transaction. Beside that, KUTKM's Messenger also can be reducing the billing cost for one organization that currently uses the telephone line for communication (voice transaction).

For using the KUTKM's Messenger, the basic requirement is only using a computer, microphone, and speaker and LAN equipment. From this equipment the user can send and receive data and also to voice chat each other like using telephone communication.

1.1.2 Problem Statement

Purpose problem statements are to determine type of problem and solution for every problem. Goals and purpose of project has been depends from their problem solution. This is list of problem statement of communicate on LAN KUTKM environment.

i.   Telephone line.
      Today in KUTKM environment user can communicate by telephone line. This situation are involved a telephone billing and increase cost for one

organization. Perhaps they needed more efficient technology that can reduce their cost for telephone billing.

ii. Sending and receiving data via email.
The communication using email is not practical in LAN environment. KUTKM's Messenger can send direct. But the KUTKM's Messenger has been developing to solve that problem.

1.1.3 Project Methodology

Method for information collection is very important to developing the KUTKM's Messenger. Basically, the main resources that needed to be used the collecting information is a literature review, case studies, theoretical analysis, survey (questionnaire) and others. The details of information gathering methods will be presented in Chapter 2.

Project methodology is very important because is the overall process of developing information systems through a multi step process from investigation of initial requirements through analysis, design, implementation and maintenance. There are many different models and methodologies, but each generally consists of a series of defined steps or stages.

In the early days of the personal computer, software development consisted of a programmer writing code to solve a problem or automate a procedure. It is same been done toward the development of this network application. As the result, 'Waterfall Model' is chosen and the details of information about the 'Waterfall Model' will be presented in Chapter 3

1.2   Objective of the Project

The objective of implement the KUTKM Messenger on LAN environment at KUTKM is a. Intensive Application for KUTKM's Messenger: -

- To change the currently communication between users by using telephone line to the IP address on LAN.
- Users can be voice chat using the KUTKM's Messenger on the LAN.
- Call a contact's computer and talk on LAN for free and send instant messages to a pager and get a response.
- Easier for users to send pictures, music or documents with using the KUTKM's Messenger on LAN.
- To encourage the users using the information technology infrastructures that provided by government.
- Using the KUTKM's Messenger, organization can be reducing telephone billing cost, because KUTKM's Messenger use the Internet Protocol in the LAN communicates.

1.3   Scope of the Project

The scope of the KUTKM's Messenger to implement on LAN (Local Area Network) is a:-

1.3.1   Users

Any users on LAN can use the KUTKM's Messenger to communicated by voice or chatting. An example user to use the KUTKM's Messenger in the KUTKM is a student, lecture and KUTKM staff. With using the KUTKM's Messenger, user did not to

see any user to chat or take the some document because the KUTKM's Messenger can reduce the time for user to doing any job in the same time.

1.3.2 System

The KUTKM's Messenger is focus to LAN user in organization, KUTKM's Messenger cannot be use by user that over LAN environment in KUTKM because this application is built only in LAN organization. It just can be use to communicate in LAN environment. This application did not use the Internet service to communicate; it communicated using the IP in LAN.

1.3.3 Area of research

Functionality of the KUTKM's Messenger is a chatting (simple message), call on computer (voice chat), sending and receive the picture, music or some document.

1.4 Project Significance

KUTKM's Messenger concept same like a Voice over IP (VoIP) technology is about transmitting a voice signal across an IP network (the Internet for example). The context of this voice signal determines constraints for this transmission. For instance, if this voice signal is a part of a conversation between two people, care must be taken to preserve its real-time characteristics. The delay between one person talking and the other person hearing what was said should be as low as possible to avoid irritable gaps in the communication. Other applications of KUTKM's Messenger like an on-line lecture and can sending or receive some document.

The classical use for KUTKM's Messenger is as a replacement for a telephone call. Using KUTKM's Messenger like this can reduce costs in various ways, but the quality of the conversation is usually lower than that of a normal telephone call. Using KUTKM's Messenger in intranet (LAN) environments is relatively new. Such applications would allow users to chat and sending or receive some document with each other, like on IRC, but instead of typing messages to each other they could simply talk with other users. Many other applications use similar techniques as KUTKM's Messenger, for example the transmission of a video signal.

1.5   Conclusion

In conclusion, this chapter introduces about KUTKM's Messenger project. The main purpose is to introduce the project, problem statement of the project, project methodology, objective of the project, scope of the project and project significance.

The next chapter will be describes about the literature review and case study about messenger concept same like a Voice over IP (VoIP).

CHAPTER II

LITERATURE REVIEW

2.1   Introduction

This chapter will discuss on the method that used to gathering information and signification of future review. The main focus is on the literature review, Internet research and case study about the VoIP (Voice over Internet Protocol), which will be discussed detailed in this chapter. This chapter will also look on architecture system requirement for the new system and how to implement it.

2.1.2   KUTKM's Messenger Introduction (on LAN)

KUTKM's Messenger concept same like a Voice over IP (VoIP) technology is about transmitting a voice signal across an IP network (the Internet for example). The context of this voice signal determines constraints for this transmission. For instance, if this voice signal is a part of a conversation between two people, care must be taken to preserve its real-time characteristics. The delay between one person talking and the other person hearing what was said should be as low as possible to avoid irritable gaps in the communication. Other applications of KUTKM's Messenger like an on-line lecture and can sending or receive some document.

This section is about the way this software is organized. It also contains about the layered design model, which is a good example of this structured design and about the TCP/IP reference model, in which as the name suggests IP plays a very important role.

2.2   Case Study

2.2.1   Introduction about VoIP (Voice over Internet Protocol)

As networking technology continues advance, more and more applications are sought after to take advantage of these new generation high-speed infrastructures. In parallel with this new generation networking equipment, applications are being developed to converge disparate systems into a single cohesive, manageable system. VoIP is one example of this, converging what traditionally has been completely separate systems, usually managed by two different groups into a single, manageable system.

Voice over IP (VoIP) is not a new network, but a new application on IP networks. Traditionally, the voice is transported on a network that uses circuit switching technology, where data networks are built packet-switched technology. There are various reasons this transition is taking place, many of which have to do with economies of scale. Traditionally a Telephony network has been architected around circuit switch technology, requiring specific equipment and management techniques. *Networks have emerged from being a difficult to implement, side thought for many companies to a critical part of their business strategy and an integral part of their economic growth. [4]

*Networks - referring to data networks consisting of Local, Metropolitan and Wide area Networks. Including (but not exclusive to) 10/100 Ethernet, Gigabit and Packet over Sonet (POS) technologies.

Packet data thrives over a voice network, but voice trembles at just the thought of traveling over a packet data network.

Actually, it will work, and quite nicely if everything works just right. The trick is to keep latency, jitter and loss within limits. While that can be tough in a network that is