BORANG PENGESAHAN STATUS TESIS

JUDUL: VIDEO CONFERENCE SYSTEM FOR CLASSROOM TEACHING

SESi PENGAJIAN: 3 - 2007/2008

Saya ** ZAFIRAH BINTI SALIM **

mengaku membenarkan tesis (PSM) ini disimpan di Perpustakaan Fakulti Teknologi
Maklumat dan Komunikasi dengan syarat-syarat kegunaan seperti berikut:

1. Tesis dan projek adalah hakmilik UNIVERSITI TEKNIKL MALAYSIA,
   MELAKA.
2. Perpustakaan fakulti Teknologi Maklumat dan komunikasi dibenarkan
   membuat salinan untuk tujuan pengajian sahaja.
3. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan
   untuk membuat salinan tesis ini sebagai bahan pertukaran antara institusi
   pengajian tinggi.
4. **Sila tandakan (/)***

   _________ SULIT  (Mengandungi maklumat
   yang berdasar keselamatan
   atau kepentingan Malaysia
   seperti yang termaktub di
   dalam AKTA RAHSIA
   RASMI 1972)

   _________ TERHAD  (Mengandungi maklumat
   terhad yang telah di tentukan
   oleh organisasi/badan di
   mana penelitian
   dijalankan)

   _________ TIDAK TERHAD


Tandatangan Penulis:  

(Tandatangan Penulis)

Alamat Tetap: No 56 Jalan AU 5C/8,
Lembah Keramat, 54200 Kuala Lumpur,
Tarikh: 23/6/08

CATATAN: **Tesis dimaksudkan sebagai Laporan Projek Sarjana Muda (PSM)
** Jika tesis ini SULIT atau TERHAD, sila lampirkan surat daripada
pihak berkuasa.

Tandatangan Penyelia:

(Tandatangan Penyelia)

Puan Khadijah Binti Wan Mohd Ghazali
Tarikh: 23/6/08
VIDEO CONFERENCE SYSTEM FOR CLASSROOM TEACHING

ZAFIRAH BINTI SALIM

This report is submitted in partial fulfillment of the requirements for the Bachelor of Computer Science (Network Computer)

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA
2008
DECLARATION

I hereby declare that this project report entitled

VIDEO CONFERENCE FOR CLASSROOM TEACHING

Is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT: ___________________________ Date: 20 June 2008
(ZAFIRAH BINTI SALIM)

SUPERVISOR: ___________________________ Date: 20 June 2008
(PUAN KHADIJAH BINTI WAN GHAZALI)
DEDICATION

To my beloved parents, En Salim Bin Abd. Rahman and Pn. Hatiah Binti Awang, my whole family, my supportive supervisors, Pn. Khadijah Binti Wan Mohd. Ghazali and all my understandable friends. Thank you for the support and guidance given throughout the completion of my PSM.
ACKNOWLEDGEMENTS

Alhamdulillah and thanks to Almighty Allah, my families and to all who has made this project come true. Special thanks to Mrs. Khadijah Bt Wan Mohd Ghazali for being a dedicated and understandable supervisor in providing endless guidance throughout the fulfillment of the Bachelor’s Degree Thesis. Therefore, I would like to thank you for all support and guidance.

I also would like to thank Mr. Zulkiflee Bin Muslim for all him ideas and comments on my PSM system. Not forgetting him help regarding my PSM report. I shall also forward my appreciation to other lecturers who never turn me down when being consulted for extra advice in carrying out the project.

And finally, I would also like to thank my family, lecturers and friends for their support and understanding especially those who have taken time to advice upon and proof read this document.
ABSTRACT

The project that had been developed is allowing the lecturer and the student to communicate through the system for education environment. This project will be known as Video Conference System for Classroom Teaching. There are three major module included in the Video Conference System which is the Video and Audio Configuration Module, Whiteboard Sharing Module and File Transfer Module. This report contains the introduction, methodology, analysis, design, implementation, testing and project conclusion. Video Conference System which allow two or more locations to interact via two-way video and audio transmissions simultaneously. It has also been called visual collaboration and is a type of groupware. Video conferencing technology provides a video link between two or more people, which allows them to see and hear each other at the same time. It works like two-way TV. It digitally reproduces your image using IP (Internet Protocols) technology, a standard set of rules to enable data transfer, and Local Area Network (LAN) connection. The project methodology used in this project is Software Development Life Cycle (SDLC) Methodology. Video Conference System is developed using Java as the programming language and the MySQL as the database. To develop the real system, designs were made to covers the system architecture, user interfaces and database design. This system is hoped that the teaching and learning process will going smoothly and give many benefits to the users themselves.
ABSTRAK

# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>SUBJECT</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DECLARATION</td>
<td>i</td>
</tr>
<tr>
<td></td>
<td>DEDICATION</td>
<td>ii</td>
</tr>
<tr>
<td></td>
<td>ACKNOWLEDGEMENTS</td>
<td>iii</td>
</tr>
<tr>
<td></td>
<td>ABSTRACT</td>
<td>iv</td>
</tr>
<tr>
<td></td>
<td>ABSTRAK</td>
<td>v</td>
</tr>
<tr>
<td></td>
<td>TABLE OF CONTENTS</td>
<td>vi</td>
</tr>
<tr>
<td></td>
<td>LIST OF TABLES</td>
<td>xi</td>
</tr>
<tr>
<td></td>
<td>LIST OF FIGURES</td>
<td>xiii</td>
</tr>
<tr>
<td></td>
<td>LIST OF ATTACHMENTS</td>
<td>xv</td>
</tr>
</tbody>
</table>

## CHAPTER INTRODUCTION

I

1.1 Project Background 1
1.2 Problem Statements 2
1.3 Objectives 3
1.4 Scope 3
1.5 Project Significance 4
1.6 Expected Output 4
1.7 Conclusion 5

## CHAPTER LITERATURE REVIEW AND PROJECT METHODOLOGY

II

2.1 Introduction 6
2.2 Facts and Findings 7
    2.2.1 Domain 7
2.2.1.1 Development Tools 7
2.2.1.2 Database 11
2.2.1.3 Programming Language 14
2.2.2 Existing System 17
  2.2.2.1 Video and Audio Conference (VAC) 17
  2.2.2.2 e/pop Video Conference Software 19
  2.2.2.3 Windows NetMeeting 3.0.1 20
2.2.3 Study Case 21
  2.2.3.1 University of Oxford 22
  2.2.3.2 University of Manchester 23
  2.2.3.3 National University of Singapore 24
2.2.4 Technique 25
  2.2.4.1 Video Streaming 25
  2.2.4.2 Audio Streaming 26
2.3 Project Methodology 26
  2.3.1 Planning 26
  2.3.2 Analysis 27
  2.3.3 Design 27
  2.3.4 Implementation 27
2.4 Project Requirements 28
  2.4.1 Software Requirements 28
  2.4.2 Hardware Requirements 28
2.5 Project Schedule and Milestones 28
2.6 Conclusion 30

CHAPTER ANALYSIS

III

3.1 Introduction 31
3.2 Problem Analysis 32
  3.2.1 Background of the current system 32
  3.2.2 Data Flow Diagram (DFD) of The Current System 32
3.2.3 Problem of Current Situation
3.3 Requirement Analysis
  3.3.1 Data Requirement
  3.3.2 Functional Requirement
    3.3.2.1 Data Flow Diagram (DFD) of To Be Develop
  3.3.3 Non-Functional Requirement
  3.3.4 Other Requirement
    3.3.4.1 Software Requirement for Development
    3.3.4.2 Software Requirement for Server
    3.3.4.3 Hardware Requirement for Development
    3.3.4.4 Network Requirement for Development
3.4 Conclusion

CHAPTER DESIGN
IV
4.1 Introduction
4.2 Hgh-Level Design
  4.2.1 System Architecture
    4.2.1.1 Flowchart of the Video Conference System
    4.2.1.2 Flowchart of the Login Page
    4.2.1.3 Flowchart of the Class Creation Page
  4.2.2 User Interface Design
    4.2.2.1 Navigation Design
    4.2.2.2 Input/Output Design
  4.2.3 Database Design
    4.2.3.1 Conceptual and Logical Database Design
4.3 Detailed Design
  4.3.1 Software Specification
  4.3.2 Physical Database Design
4.4 Conclusion
CHAPTER IMPLEMENTATION

V

5.1 Introduction 78
5.2 Software Development Environment 79
  5.2.1 Software Environment Setup 80
  5.2.2 Hardware Architecture 82
5.3 Software Configuration Management 84
  5.3.1 Configuration Environment Setup 84
  5.3.2 Version Control Procedure 86
5.4 Implementation Status 87
5.5 Conclusion 91

CHAPTER TESTING

VI

6.1 Introduction 92
6.2 Test Plan 93
  6.2.1 Test Organization 93
  6.2.2 Test Environment 94
  6.2.3 Test Schedule 96
6.3 Test Strategy 97
  6.3.1 Classes of Test 98
6.4 Test Design 100
  6.4.1 Test Description 100
  6.4.2 Test Data 103
6.5 Test Result and Analysis 104
6.6 Conclusion 108

CHAPTER PROJECT CONCLUSION

VII

7.1 Observation on Weakness and Strengths 110
7.1.1 Strengths of the Video Conference System 110
7.1.2 Weaknesses of the Video Conference System 111
7.2 Proposition for Improvement 112
7.3 Contribution 112
7.4 Conclusion 113

REFERENCES

BIBLIOGRAPHY

APPENDICES
## LISTS OF TABLES

<table>
<thead>
<tr>
<th>TABLE</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Comparison of Integrated Development Environment (IDE)</td>
<td>9</td>
</tr>
<tr>
<td>2.2</td>
<td>Database Management System (DBMS) for MySQL, Oracle and Microsoft Access</td>
<td>12</td>
</tr>
<tr>
<td>2.3</td>
<td>Programming language for Java, C++ and Visual Basic</td>
<td>15</td>
</tr>
<tr>
<td>2.4</td>
<td>Project schedule and Milestone for PSM1</td>
<td>27</td>
</tr>
<tr>
<td>2.5</td>
<td>Project schedule and Milestone for PSMII</td>
<td>28</td>
</tr>
<tr>
<td>3.1</td>
<td>Data of Users</td>
<td>33</td>
</tr>
<tr>
<td>4.1</td>
<td>Login Interface</td>
<td>52</td>
</tr>
<tr>
<td>4.2</td>
<td>Registration Interface</td>
<td>53</td>
</tr>
<tr>
<td>4.3</td>
<td>Join Class Interface</td>
<td>54</td>
</tr>
<tr>
<td>4.4</td>
<td>Password for Join Class Interface</td>
<td>55</td>
</tr>
<tr>
<td>4.5</td>
<td>Class Creation Interface</td>
<td>56</td>
</tr>
<tr>
<td>4.6</td>
<td>Main Menu Interface</td>
<td>57</td>
</tr>
<tr>
<td>4.7</td>
<td>Private Chat Interface</td>
<td>58</td>
</tr>
<tr>
<td>4.8</td>
<td>Whiteboard Sharing Interface</td>
<td>59</td>
</tr>
<tr>
<td>4.9</td>
<td>File Transfer Interface</td>
<td>60</td>
</tr>
<tr>
<td>4.10</td>
<td>Video and Audio Interface</td>
<td>61</td>
</tr>
<tr>
<td>4.11</td>
<td>Login Page</td>
<td>64</td>
</tr>
</tbody>
</table>
4.12 Registration Page 65
4.13 Join Class Page 67
4.14 Class Creation Page 69
4.15 Private Chat Page 70
4.16 Whiteboard Sharing Page 71
4.17 File Transfer Page 72
5.1 Port numbers for the applications 81
5.2 Difference of UTP Cable 82
5.3 Version Control Procedure 86
5.4 Implementation Status 86
6.1 Test Organization Video Conference System 92
6.2 Video Conference System Test Environment 93
6.3 Test Schedule for Video Conference System 95
6.4 Functionality Testing of Video Conference System 97
6.5 Performance Testing of Video Conference System 98
6.6 Test Description of Video Conference System 100
6.7 Test Procedure Form 102
6.8 Test Data of Video Conference System 102
6.9 Test Result and Analysis of Video Conference System 104
6.10 Actions for Failed Test Cases 106
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>DIAGRAM</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Screen shot of the main GUI of AChat application</td>
<td>17</td>
</tr>
<tr>
<td>2.2</td>
<td>Screen shot of e/pop Video Conference Software</td>
<td>18</td>
</tr>
<tr>
<td>2.3</td>
<td>Screen shot of Windows NetMeeting 3.01</td>
<td>20</td>
</tr>
<tr>
<td>2.4</td>
<td>Students learn by video conferencing in classroom</td>
<td>21</td>
</tr>
<tr>
<td>2.5</td>
<td>Scene in video conference studio</td>
<td>22</td>
</tr>
<tr>
<td>2.6</td>
<td>Multiparty video conference</td>
<td>23</td>
</tr>
<tr>
<td>3.1</td>
<td>Data Flow Diagram of Current System</td>
<td>31</td>
</tr>
<tr>
<td>3.2</td>
<td>Context Diagram System to be develop</td>
<td>35</td>
</tr>
<tr>
<td>3.3</td>
<td>Data Flow Diagram level 0 Video Conference System</td>
<td>36</td>
</tr>
<tr>
<td>3.4</td>
<td>Data Flow Diagram level 1 Log in system module</td>
<td>37</td>
</tr>
<tr>
<td>3.5</td>
<td>Data Flow Diagram level 2 Create profile module</td>
<td>38</td>
</tr>
<tr>
<td>3.6</td>
<td>Data Flow Diagram level 3 Selecting the class module</td>
<td>39</td>
</tr>
<tr>
<td>3.7</td>
<td>Data Flow Diagram level 4 Go to Main Menu module</td>
<td>40</td>
</tr>
</tbody>
</table>
## LISTS OF ATTACHMENTS

<table>
<thead>
<tr>
<th>APPENDIX</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Gantt Chart</td>
<td>114</td>
</tr>
<tr>
<td>B</td>
<td>User Manual</td>
<td>115</td>
</tr>
<tr>
<td>C</td>
<td>Detailed Design</td>
<td>116</td>
</tr>
<tr>
<td>D</td>
<td>Test Procedure Form</td>
<td>117</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

1.1 Project Background

A video conference is a live connection between people in separate locations for the purpose of communication, usually involving audio and often text as well as video. At its simplest, video conferencing provides transmission of static images and text between two locations. At its most sophisticated, it provides transmission of full-motion video images and high-quality audio between multiple locations. The Video Conference System for Classroom Teaching is a network-based project that mainly provides video conferencing for classroom teaching environment.

Currently, the teachings were held traditionally in classroom at Universiti Teknikal Malaysia Melaka (UTeM). The problem will come out when the students miss some classes just because they have to travel here and there. Moreover, even the some of the lecturers also have to move from one place to another place just because they have only one class in one day. Besides that, there are three campuses which are Industry Campus (Ayer Keroh), Main Campus (Durian Tunggal) and City Campus (Hang Tuah). So if they want to attend a class, there will be some problems such as they have to travel from one place to another place that cause of wasting time and money.
By using this video conference system, the students or lecturers just have to go one place and yet the learning and teaching process still can operate smoothly. There will be no reason for the students to miss classes anymore. In addition, the lecturers and students do not have to waste their time and money to travel from one place to another place. The system will be as the medium to connect between the lecturer and the students.

Some knowledge is gain in developing this video conference system such as video and audio streaming protocol, file transfer protocol and whiteboard sharing protocol.

1.2 Problem Statements

- **More places to go**
  The lecturers or students have to travel from one place to another place which increases the pressure, stress and fatigue from travel.

- **Time and money waste**
  The lecturers and students somehow waste their time and money when they have to go from one place to another place to attend some classes.

- **Missing classes**
  The students might miss some class just because they have to go from one place to another place which might be pretty far and take some times to reach there.

- **Time to provide class is limited**
  The time for the lecturer to teach the class will be limited when the students come late to the class.
1.3 Objectives

- Make some research about the video conference for getting the idea and source for developing the Video Conference System.

- Analyzing the problems of the current situation and identify the requirements such as data, functional, non-functional, software, hardware and network requirements.

- Designing the system using the Java language as the source code and Netbeans IDE as the tool kit for developing the system.

- Developing the video conference system so that it can be implementing in Local Area Network (LAN).

1.4 Scope

This Video Conference System project will be implemented in Universiti Teknikal Malaysia Melaka (UTeM). The project will be more focus on Faculty of Information and Communication Technology (FTMK), Bachelor of Computer Network (BITC) students who always use CCNP lab. There are 16 personal computers provided in the lab. Each personal computer will be installed with the web camera and the Video Conference itself.

More further, this project will be developed using Netbeans IDE open source software as the platform for development, Java as the source code language, Java Media Framework (JMF) as the multimedia development toolkit and MySQL as the database server. Besides that, this Video Conference System will be applying in Local Area Network (LAN) connection.
1.5 Project Significance

This video conference system gives many benefits and can be used by Universiti Teknikal Malaysia Melaka (UTeM) to make the learning environment more attractive and exciting. Furthermore, this system will mark UTeM as a hub of new technology in world-class learning system so that it can be practiced anywhere in the future.

Besides that, this system also will help to connect both the lecturer and students face-to-face virtually for learning and teaching without they have to move from one place to another place. Moreover, the system helps to reduce the time and cost for the lecturers and students to go to more places.

By using this system, specialized courses that UTeM could not offer because of cost or limited student interest can be shared by several institutes or colleges to provide cost efficiency. Flexibility in scheduling the classes to meet either an individual student's or a group of students' need is another major advantage.

1.6 Expected Output

The expected output from this project is Video Conference system. The user can use the video conference for the education activities in the classroom. Besides that, the user also can employ other applications such as whiteboard sharing, private chat and file transfer function. Moreover, this system allow the students to join the class that been created by the lecturer through the video conference.
1.7 Conclusion

As the conclusion, this Video Conference System for Classroom Teaching will help the lecturers and students to communicate live face-to-face with each other for a learning process. Furthermore, video conferencing is a cost-effective way for educational institutions to deliver successful educational experiences to an expanded student population.

The problem statements, objectives, scope and project significance output had been identified from this chapter in order to develop a good system which will be used by the target users.
CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

A literature review is a summary and explanation of key studies relevant to a proposed project. The literature review is one of the slightest understood parts of a research project. Besides a part of significant report in a research project, literature review also can be a bibliography essay that is published separately in a scholarly journal. The purpose is still the same which is to evaluate the scholarly literature relevant to the topic studied for both ways. This review will help to design the methodology and help others to understand the research.

In this chapter, the literature review is focus on the research of the current system and the new system. The purpose of a literature review is to explain how the question to be examined suitable into the larger picture and why this approached the topic. This section of a scholarly report allows the reader to be brought up the date concerning the state of research in the field and familiarizes to any contrast perspectives and viewpoints on the topic.
2.2 Facts and Findings

This section will be discussing about the domain of this project, the existing system and finally the other techniques that applicable used in to develop this project.

2.2.1 Domain

The domain of this system is Video Conference. A videoconference is a live connection between people in separate locations for the purpose of communication, usually involving audio and often text as well as video. At its simplest, videoconferencing provides transmission of static images and text between two locations. At its most sophisticated, it provides transmission of full-motion video images and high-quality audio between multiple locations.

Videoconferencing software is quickly becoming standard computer equipment. For example, Microsoft's NetMeeting is included in Windows 2000 and is also available for free download from the NetMeeting homepage. For personal use, free or inexpensive videoconference software and a digital camera afford the user easy - and cheap - live connections to distant friends and family. Although the audio and video quality of such a minimal setup is not high, the combined benefits of a video link and long-distance savings may be quite persuasive. (Whatis.com, 2007a)

2.2.1.1 Development Tools

Integrated Development Environment (IDE)

In computing, an integrated development environment (IDE) is a software application that provides comprehensive facilities to computer programmers for software development. An IDE normally consists of a source code editor, a compiler and/or interpreter, build automation tools, and (usually) a debugger. Sometimes a version