# UNIVERSITI TEKNOLOGI MARA

# IMPLEMENTATION OF WLAN IN KUALA LUMPUR INFRASTRUCTURE UNIVERSITY COLLEGE, KLIUC: A CASE STUDY

**MAZNI MOHAMED JAKERI**

Thesis submitted in partial fulfillment of the requirements
for the degree of
**MASTER OF SCIENCE**
**INFORMATION TECHNOLOGY**

JUNE 2004

# ACKNOWLEDGEMENTS

First of all, I would like to express my gratitude to my parents for supporting me to finish this research paper. To my beloved husband and my lovely son, thank you for your understanding. Without your support and love, I could never success finish writing this report. To my supervisor, Assoc. Prof. Dr. Mazani, thank you for your advice and valuable feedback. Lastly but not least, to Mr. Roslan, who always there to answer my questions.

# TABLE OF CONTENTS


| | Pages |
|---|---|
| **ACKNOWLEDGMENTS** | ii |
| **LIST OF TABLES** | vi |
| **LIST OF FIGURES** | vii |
| **LIST OF ABBREVIATIONS** | viii |
| **ABSTRACT** | x |
| **1.0 INTRODUCTION** | 1 |
| 1.1 Introduction | 1 |
| 1.2 Objectives | 2 |
| 1.3 Organization's Background | 2 |
| 1.4 Problem Statement | 3 |
| 1.5 Research Scope | 3 |
| 1.6 Research Significant | 4 |
| 1.7 Research Outline | 4 |
| 1.8 Conclusion | 5 |
| **2.0 LITERATURE REVIEW** | 6 |
| 2.1 Introduction | 6 |
| 2.2 IEEE 802.11 | 8 |
| 2.2.1 802.11b | 9 |
| 2.2.2 802.11a | 9 |
| 2.2.3 802.11g | 10 |
| 2.3 Architecture Components | 11 |
| 2.3.1 Physical Layers | 11 |
| 2.3.2 MAC Layer | 13 |
| 2.3.3 Channels | 13 |
| 2.4 Performance and Characteristics | 14 |
| 2.4.1 Data Rates | 15 |
| 2.4.2 Range and Data Rates | 15 |

2.4.3 Throughput 17
2.4.4 Compatibility 17
2.5 Authentication and Security 17
2.5.1 Access Authentication 17
2.5.2 Secured Data Transfer 18
2.6 Billing System 19
2.7 How WLAN Works? 20
2.8 Choosing the Right Standard 21
2.9 WLAN Benefits 23
2.10 WLAN Components 24
2.10.1 Mobile Station 24
2.10.2 Access 24
2.10.3 Switches 25
2.10.4 WAN Access Gateway/Routers 25
2.10.5 Network Access Controller 26
2.10.6 AAA Server 26
2.10.7 High Speed Internet Connection 26
2.10.8 Internet Service Provider 28
2.11 Methodologies/Approaches for Implementing WLAN 28
2.12 WLAN Implementation in Other Universities/Colleges 29
2.13 Conclusion 32

3.0 **METHODOLOGY** 34
3.1 Introduction 34
3.2 Methods of Research 35
3.3 Problem Identification 36
3.4 Preliminary Information Gathering 36
3.5 Tools of Requirements 37
3.5.1 Hardware 38
3.5.2 Software 38
3.6 Conclusion 39

# ABSTRACT

In the just few years, wireless Local Area Networks (WLANs) have come to occupy a significant niche in the local area network market. Increasingly, organizations are finding that WLANs are an indispensable adjunct to traditional wired LANs, or maybe replacing wired LANs, in order to satisfy requirements for mobility, relocation, ad-hoc networking, and coverage of locations difficult to wire. This research paper documented valuable knowledge on how to implement WLAN in KLIUC from scratch. The main objective of deploying WLAN which is to provide alternative Internet access to students is successfully done, however certain aspect such as security is still in progress.



Keywords: wireless LANs (WLAN), component, architecture, security, and availability.