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# HARDWARE AND NETWORK MAINTENANCE SUPPORT SYSTEM

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This report is submitted in partial fulfillment of the requirements for the  
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2005

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## **DEDICATION**

To my beloved parents, Hj Safiee Ismail and Hjh Norlaili Hayati Hj Mohd Yusof, my sister Lilis Shereena Hj Safiee, my lovely grandmother Hjh Zaharah Md Sudin and my whole family. Thanks for the support and courage I got throughout completing my Project Sarjana Muda (PSM).

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During this thesis performing there is a lot of knowledges I gained especially in developing project like phases involved, steps included in each phase, detailed research of systems and prefix design before proceed with implementation of project. I was exposed with OOAD method and how to perform it in detailed. All the required phases in project development were exposed during this PSM II phase. Through this PSM II, I'm fully implementing the knowledges I gained from previous learning and sharpen my skill in project development. Lastly, thanks for all individual involved in my PSM II whether directly or indirectly.

## ABSTRACT

This research included the hardware and network maintenance work did in Toshiba Electronics Malaysia and the main purpose is to develop a better system than available current systems. The main problem here is no efficient system for maintenance works, no proper network connections and PC location's layout and no troubleshooting guidelines. The solving method is to perform analysis of current systems and proposed system and next, implement the available features, advantages and weaknesses to create a better system. In overall this system using Local Area Network (LAN) as the medium to access the system which is it will be implemented in Toshiba internal portal called *Management Rationalization Tools* (MRT). This system use Object Oriented Analysis Design (OOAD) as methodology which is it participate Unified Modeling Language (UML) as analysis process. The OOAD implementation is include the development of action diagram, use case diagram, interaction diagram, deployment diagram and class diagram. The result in this research is the development of a system called *Hardware and Network Maintenance Support System* (HNMSS) to support all the dearth and frailty of current systems and be an effective system for maintenance use.

## ABSTRAK

Kajian ini melibatkan kerja – kerja penyelenggaraan perkakasan dan rangkaian yang dilakukan di Toshiba Electronics Malaysia dan tujuan utamanya adalah untuk membangunkana sistem yang lebih baik dari sistem – sistem yang sedia ada. Masalah utama di sini ialah tiada sistem yang lebih efisien untuk kerja – kerja penyelenggaraan, tiada pelan system rangkaian dan kedudukan komputer yang teratur dan tiada rujukan lain untuk proses pengesanan masalah. Cara penyelesaian masalah ialah dengan membuat kajian ke atas sistem yang sedia ada dan sistem yang hendak di bangunkan. Dan seterusnya mengaplikasikan kelebihan, pengatasian ke atas kelemahan dan ciri – ciri yang ada untuk menghasilkan sistem yang lebih baik. Secara keseluruhannya sistem ini menggunakan rangkaian tempatan (LAN) sebagai medium untuk mengakses sistem ini yang akan di tempatkan di dalam portal kegunaan dalaman Toshiba yang di panggil *Management Rationalization Tools* (MRT). Sistem ini menggunakan analisis dan rekabentuk berorientasikan objek (OOAD) sebagai metodologi dimana ia menggunakan UML sebagai proses analisis. Penggunaan OOAD melibatkan pembangunan rajah *use case*, rajah *interaksi*, rajah *aktiviti*, rajah *deployment* dan rajah *kelas*. Keputusan ke atas kajian yang dilakukan ialah banggunya sebuah sistem yang di gelar *Hardware and Network Maintenance Support System* yang akan menampung kekurangan dan kelemahan sistem yang sedia ada dan menjadi sistem yang lebih efektif untuk kegunaan penyelenggaraan.

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**LIST OF ABBREVIATION**

<b>TERMS</b>	<b>EXPLANATION</b>
MRT	Management Rationalization Tool
WIFI	Wireless
AS 400	A kind software used in Toshiba
LOTUS NOTES	A kind of software used for mailing service
DUMB TERMINAL	Terminal for AS 400 (server)
DD	Discrete Department
IT	Information Technology Department
AD	Administrative Department
ED	Engineering Department
SP	Shipping and Purchasing Department
QA	Quality Assurance Department
IC	Integrated Circuit Department
FA	Financial Department

**LIST OF APPENDICES****APPENDIX****TITLE**

A	GANTT CHART
B	NAVIGATION DESIGN
C	DATA DICTIONARY
D	USER MANUAL

## **CHAPTER I**

### **INTRODUCTION**

#### **1.1 Introduction**

Hardware and network maintenance support system is a system that developed for Information Technology (IT) Department of Toshiba Electronics Malaysia. This system developed just for Business Application's group of IT Department use and implemented on Toshiba external portal called Management Rationalization Tool (MRT). This system only for Business Application group members and special for maintenance work management since currently there is no proper and efficient maintenance system. This system include reminder function, guideline references; some kind of help desk and able for reports generating.

#### **1.2 Project Background**

The developed system is as a support system for hardware and network maintenance works of Business Application group. This system provides a system for clients to send reports/requests of hardware or network maintenance works. The priority inserted makes the system able to send reminder to the responsible persons. System provides list of PCs and details, layouts (for PCs locations and network connections) and an alternative troubleshooting convenience for group members to refer plus the ability of

system to generate reports and statistic for further use and references makes this system more practical to be implemented.

Currently a mailing system called IT Job Request used to send requests for IT Department staff. Since IT Department took over technologies and IT matters, the requests getting increased day by day and some of them delayed because lack of staff and too many tasks waiting. There is no proper follow up of each thing done and no reminders to make the actions keep in track. There is no specific system developed only for maintenance support especially troubleshooting guidelines and exact PCs and network layouts/diagrams for further references.

The specific purpose for developed this system is to support and to make maintenance works easier for group members. By reminder function, the task solving will be more punctual and IT Job Request will be able clients to send any request for IT Department actions. The troubleshooting guideline provided will give good benefit for all staff especially trainee and the layouts provided will be easy references to all, save time and made layouts maintenance easier in future.

This developed system will act as controlling system for maintenance works by the generated reports and statistics. Through this generated reports and statistics, will be reference sources for problems identification, solving methods and for any improvements action.

### 1.3 Problem Statements

Obviously, there are some problems occur for the current system that makes this system proposed. They are;

- i) **No efficient maintenance system for company**  
All maintenance work done personally after the task divided based on client's requests through IT Job Request. There were no proper follow up during the task given or after the task completed.
- ii) **No proper network connections and PC location layouts**  
The layouts exist but hold by certain people like senior engineer who were responsible for network in Toshiba and most of the layouts were not updated and not detailed enough. The limited sources sometimes mixed up and became confusing to make any reference and difficult for layout maintenance. No layout for staff and especially trainee to refer.
- iii) **Delay of problem solving and lack of guidance**  
Previously any confused or unsettled problem had to refer to the expert peoples by contact them through phone. Sometimes the particular persons are busy or can't be finding at office and sometimes can't reach by hand phone. So the problem solving delayed and burdening other peoples to do their works. No alternative sources
- iv) **No reports generated for management group**  
Yet there were no report generated from the completed maintenance works. Once the task settled then that's it. For some problems arise then will be discussed in group meeting which is held every week.

## 1.4 Objectives

The objective of developed Hardware and Network Maintenance Support System are;

- i) To provide a smart and useful system for maintenance works and to make the maintenance management will be smoothly, systematic and produced effective services.
- ii) To produce an alternative reference sources by providing PC locations diagram together with details, network flow layouts and preparing troubleshooting guidelines for all staff especially for trainee to refer.
- iii) To provide troubleshooting guidelines that can be access by maintenance staff due to the problem arise
- iv) To develop an effective computerized system to manage request data so that troubleshooting works and other maintenance works became easier and save time and next save costs.
- v) To develop a system that can generate reports for improvements actions  
Through this system, reports can be generated and statistics can be analyzed for the causes of problems, how to prevent and how to reduce costs. Action can be taken based on the analysis and improvement can be done to maintain productivity.

## 1.5 Scopes

This hardware and network support system will be implemented on IT Department part on Toshiba Electronics Malaysia portal called Management

Rationalization Tool (MRT) while the system restricted only for Business Application group members of IT Department as administrators and clients. Security setting for different user and security for data provided to prevent data sabotage. Technologies will be implemented are SMS application for system use. Next are the scopes in detail for each function;

i) IT Job Request

The sub functions are;

- Clients can make any request according to all IT and technology matters like PC or network problems, setup, installations, since the permission only for administrator and many more. Request can be sent by specifying the problems/matters, person in charge, expected solving duration and the priority from 1 to 5 will be given by section manager once the approved requests sent.
- By priority, all the number 1 priority matters will be given the more attention. SMS as reminder will be sent to the person in charge by system about the request's details in brief. Section manger will dividing and assigning the tasks according to group member's expertise and tasks schedule during weekly meeting. Every staffs on Business Application group have to check their IT Job Request task account frequently.

ii) Client PC List

By this Client PC List, all the computers available in Toshiba were listed to make the maintenance process easier. These functions are divided to 2 sub functions;

- First sub function is for all type of user who wishes to view the list of PC or to find any information about the PC's like computer name, asset number, department, OS etc.