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Norazlinawati Azmi.

EQUIPMENT PERFORMANCE ONLINE TRACKING SYSTEM

NORAZLINAWATI BINTI AZMI


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


FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
KOLEJ UNIVERSITI TEKNIKAL KEBANGSAAN MALAYSIA
2006

DECLARATION

I hereby declare that this project report entitled
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is written by me and is my own effort and that no part has been plagiarized
without citations.

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DEDICATION

To my beloved parents, Mr. AZMI BIN AHMAD and Madam SALMIAH BINTI

OTHMAN.

Thank you for the fully support.

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Alhamdulillah to ALLAH SWT for his gratefulness and kindness for allowing me and has help me in so many ways in completing my Project Sarjana Muda

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Secondly, I would like to thank my entire lecturer from the Faculty of Computer Science who had teaches and guides me during my studies in KUTKM, also to the whole BITD course mate their support, knowledge and skill exchange. Without them, it would be difficult for me to perform my Final Project as a KUTKM student, carryout my responsibilities as final year student and complete the project, which is still in progress.

Besides that, I would also like to thank everybody in Intel Technology Penang from Engineering Department, Engineering Planner, Quality and Reliability Team and others for all their help while I was performing my Industrial Training where I was first assign to develop this Equipment Performance Online Tracking System (EPTS).

Last but not least, I would like to conclude my thanks to my parents, family and all my friends for all their support. To my special friends, who has helps me a lot, besides his fully support in terms of mental, emotional and spiritual. Thank you.

ABSTRAK

Equipment Performance Online Tracking System (EPTS) merupakan satu aplikasi web yang dicipta khas bagi memudahkan pihak pengurusan Syarikat Intel Technology Malaysia Sdn. Bhd yang terletak di Penang, mengawal jumlah keluar masuk alat ganti rosak untuk kegunaan kilang mereka. Secara amnya, terdapat enam (6) topik didalam menghasilkan sistem ini. Topik yang pertama (I) ialah pengenalan dimana menerangkan secara terperinci latar belakang projek, pernyataan masalah, objektif, skop dan kepentingan projek. Topik kedua (II) merangkumi kajian Literature dan Projek Metodologi dimana fakta-fakta sokongan tentang system-system yang menggunakan aplikasi web dikaji bagi membantu pereka bentuk sistem merekabentuk dan menyiapkan system dengan baik. Perancangan awal bagi menjalankan semua aktiviti membangunkan projek turut dilaksanakan. Dalam Topik ke tiga (III) iaitu Analisa, keputusan analisis terhadap keadaan sistem semasa dan rekabentuk sistem yang akan dibangunkan di kaji dan dibandingkan. Segala kelemahan yang terdapat didalam sistem semasa cuba dibaikpulihkan melalui penambahan fungsi dalam sistem. Topik keempat (IV) merupakan topik Rekabentuk dimana sistem yang akan dibangunkan direkabentuk mengikut beberapa fasa seperti rekabentuk awalan diikuti rekabentuk secara terperinci. Microsoft SQL Server 2000 dipilih sebagai agen pengkalan data kepada system EPTS Topik ke lima (V). Topik ke lima (V) merupakan topik implementasi dimana sistem akan dibangunkan sepenuhnya berdasarkan keputusan pada fasa-fasa sebelumnya. Topik ini menerangkan pelaksanaan rekabentuk aplikasi dan pembangunan aturcara perisian yang telah dirancang di dalam Topik empat (IV). Topik terakhir merupakan Topik ke enam (VI) yang menitikberatkan perancangan ujian, rekabentuk ujian, keputusan ujian dan analisa bagi *Equipment Performance Online Tracking System (EPTS)*. Segala kekuatan dan kelemahan sistem turut dikaji didalam topik terakhir iaitu kesimpulan. Kesimpulan turut menjelaskan progres dan tahap pencapaian sistem yang dibangunkan.

ABSTRACT

Equipment Performance Online Tracking System (EPTS) is a web based application which is specially designed to assist the management of Intel Corporation located in Penang in dealing with the inventory of the faulty spares for the plant usage. Generally there are six topics in the development of this system. The first topic is the introduction consisting of the detail description of the project background, problem description, objective, scope and the importance of this project.

The second topic captured the Literature study and Project Methodology whereby all the supporting facts about the systems that is using web based application is analyzed and studied to assist the system designer in designing and completing a good system.

Early preparation was carried out to plan all the required activities in developing this system. The third topic is the Analysis, the result of the analysis on the current system and the design of the system that is going to be developed is being studied and compared. The designer tried to overcome all the weaknesses of the current system by adding in more functions in the new system.

The fourth topic covers the Design whereby the new system that is going to be developed is designed in couple of phases like the initial design and followed by the detail design. Microsoft SQL Server 2000 been chosen as a database engine for the system

The fifth topic is the implementation where the system will be fully developed based on the results of the phases before. This topic explains the development of the design application and the software development that have been planned in topic four. The sixth topic stressed on the test planning, test design, test result and analysis for the Equipment Performance Online Tracking System (EPTS). All the strength and weaknesses of the system are analyzed in the last topic which is the conclusion which also explains the progress and the achievement of the developed system.

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LIST OF ABBREVIATIONS

ABBREVIATION	DESCRIPTION
EPTS	Equipment Performance Online Tracking System
KUTKM	Kolej Universiti Teknikal Kebangsaan Malaysia
PSM	Projek Sarjana Muda
UML	Unified Modeling Language
ERD	Entity Relationship Diagram
EERD	Enhanced Entity Relationship Diagram
OOAD	Object Oriented Analysis Design
OOAD	Object Oriented Software Engineering
IE	Internet Explorer
ASP	Active Server Pages
IIS	Internet Information Service
PC	Personal Computer
CPVM	Component Platform Validation Monitoring
CPVS	Component Platform Validation Sampling
TIU	Test Head Indicator Unit
MTE	Maintenance Technician Engineer or Shift Technician
PM CREW	Professional Maintenance Crew or Senior Technician
PE	Product Engineer

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CHAPTER I

INTRODUCTION

1.1 Project Background

Overall this chapter will cover briefing and sufficient background on Equipment Performance Online Tracking System (EPTS) for Intel (M) Technology Sdn. Bhd. specifically for Engineering Department usage. Other topics that will be highlighted in this chapter are problem statement, objectives of the system, project's scope, project's significance or contribution and the last section will be conclusion for this chapter.

Equipment Performance Online Tracking System is actually a web-based system, which will operate online 24 hours a day and 7 days a week. The plan is to implement this system in Intel Penang and hence will use the existing Intel server. EPTS will concentrate on the equipment operation whereby system will capture their down time as well as their operation time.

Besides that, EPTS can work as an automated system to track all the part that has been used in each equipment and handler. From this system, Module Engineer (ME) can easily track the Equipment Performance without the need to be present at the Production Floor. Total number of equipment usages can also be track from time to time meaning Product Engineer (PE) can have a clearer picture of the volume of the product tested at each tester. For any problem regarding the equipment, EPTS

will auto mail to Equipment owner which is the Module Engineer. This system can save up and archive data such as equipment's history, part details, and others.

This system also plays a role as an online inventory database for those parts in Component Platform Validation (CPV) area. From this inventory reports, user will know the total number that is available currently and also the status for each part such as spare, in use, send out to Intel's Repair Station (ACTS) for repair and scrap as well as reason for swap purpose.

The system access will be granted to three kind of users which are Shift Technician (MTE), Senior Technician (PM CREW) and Product Engineer (PE). Each of this control level will definitely have different level of authorization.

Currently, the PM Crew is manually collecting the data and it is hard to maintain the database. As for now, there is no such system to maintain the Motherboard (MB) and Contactor management. By using this system, PM Crew and Product Engineer will be able to monitor the down time, which will help reduce the production cost. All data will be stored in the related table inside the database and only the admin or system developer has the right to access this database.

1.2 Problem Statement

Based on the observation and some researches carried out in the CPV area, there are quite a number of issues that can be considered as the problem statement for this Project :

1. Equipment Management

Currently there are no automatic systems to maintain and manage Equipment Performance in CPV area considering an online system that can cover 24 hours 7 day per week. Hence the Equipment Engineer needs to go to the Production Floor to get the Equipment Performance's results.

2. Time Consuming

Sometimes searching for a critical part can be very time consuming especially pertaining to equipment like Motherboard and Contactor.

3. High risk of missing important data and critical parts

Since there is no suitable and sufficient database system to store all important data and results, this will lead to a high risk and potential of missing equipment part's and hardcopy reports.

4. Manual Equipment Performance Monitoring

User needs additional resources to support equipment performances tracking and report. There are no sufficient triggering systems that can trigger equipment's owner automatically either by sending auto mail or any other auto action.

5. Manual Equipment Inventory Tracking

Due to no auto generating inventory system, the inventory calculation in the CPV area is done in the manual tracking sheets. This is not aligned to today's technology whereby all tracking can be done automatically. With this manual tracking, Product Engineer does not have accurate number of current inventory for each status and product.

6. Security

Currently, equipment's owners do not have any data or record on who is the one who fully responsible for his action towards this equipment parts. All these parts can be considered as very expensive so any action taken towards these equipment part need to have details record on user's who work with that particular equipment. Manually record taken is not accurate and sometimes lead to a highly budget consuming.

1.3 Objectives

The expected outcomes are reflected to the problem statement that been discussed in previous portion and the objectives are :

1. To have an online application that will be able to track critical part in CPV Area (Production Floor)
2. To capture down time for each equipment automatically and define pattern and root cause for each equipment down time and solve it.
3. To have details history of each equipment being used from time to time.
4. To automatic track the equipment lifetime in terms of quality, budget and supplier.
5. To have an automatic system that will trigger whenever the system does not work by sending auto mail to that particular equipment owner.
6. To create a secure environment for CPV team whereby system can automatic capture user identification, have backup and recovery data using the log file inside the Database Management System (DBMS).

1.4 Scope

This Equipment Performance Online Tracking System will be implemented in Engineering Department and the scopes are user, module, platform, development tools and system methodology.

1. User

Basically all users will be categorized into three (3) types of Access Level that are :

i) MTE (Shift Technician)

Have right to access Transaction Page and View Reports from all View Page. MTE will have different function at Down Page where they only can Suspect Down those down equipment hence PM Crew will confirm it later.

ii) PM Crew (Senior Technician)

PM Crew will play the most critical role in this system whereby they will be able to access Shipment Page, Transaction Page, View and Contact Page. At Down Page, PM Crew is the one who have the right to confirm the equipments which are down. For example, once the MTE click "Suspect Down" button, PM Crew will receive an auto mail triggering them on any equipment which was suspected to be down. This will help trigger the PM Crew for further investigations.

iii) System Admin

User that is granted with this access level will have full access to the entire system and these will cover the database manipulation and definition languages as well.

2. Module

Each of these users will definitely have their own access right to read, write and run the system or specifically the interfaces or page. This module is decomposed into smaller parts called unit that are :

i) Security

Each user need to use their own username and password as the system will automatically capture their action in minutes, based on the log on session or session expired.

- a) System requisition, store and update important data (for PM Crew)
- b) Verify or reject system's logon request (for Admin)
- c) Generate a report or Online inventory (System or Auto Generate)
- d) Suspected Equipment to be Down (for MTE)
- e) Confirm Down (for PM Crew)
- f) Auto Triggering mail (for PM Crew)
- g) Highlight Each Equipment's Parts Status (System or auto generate)
- h) Export File from View Report to Excel Format (System or auto generate)

3. Development tools and System Platform

The main development tools to develop this system are Active Server Page (ASP) and Microsoft SQL Server 2000 as a Database Management System (DBMS). Rational Rose 2000 Enterprise Edition is used to visualize the system design and analysis in the form of Unified Modeling Language (UML). Microsoft Office-Visio and Project helps to demonstrates system design from Enhance Entity Relationship (EERD) site and cover the project milestones as well. Macromedia Dreamweaver MX 2004 and Microsoft Office Front Page are used to design the interfaces and the portion to join with multimedia element is smooth using these two types of software. The platform for this system will be Microsoft XP Professional.

4. Project Methodology

The methodology chosen to develop this database system is Object Oriented Analysis and Design (OOAD) methodology. For system database development, the methodology will follow the steps in Database Life Cycle (DBLC)

5. System Deployment

Basically, since the system been request by the Intel Technology Corporation, the deployment process will take place in Component Platform Validation (CPV) Area under Engineering Department in Intel Penang (M) Sdn. Bhd itself. Fully implementation for the system will be done once the system completes the testing process such as Alpha Testing and Beta Testing.

1.5 Project Significance

Project Significance shows the benefits and the system's contribution towards the user and corporation in terms of time, effort, risks and cost reduction.

Besides tying in the system's users during the initial stage, a lots of resources, time and efforts from the system developer have been put in to make sure the best system been developed. The main intention is for this Equipment Performance Online Tracking System will give a long term impacts to the CPV process capability.

However, the main benefits will goes to the end user as well as Intel Corporation. By implementing this EPTS, regular maintenance from the PM CREW can prevent, hence will reduce the CPV equipment downtime itself. Besides, higher equipment stability will lead to a higher run rate of CPV modules and the process capability. Other while, less downtime and higher run rate is the improvement to resolve equipment shortage which will eventually lead to lower production cost.

1.6 Expected Output

The expected output for this project is not only to develop one Online Tracking System that can manage daily Production Floor process but to work as an Online Inventory System whereby Product Engineer do not have to be present physically at Production Floor whenever they need to have the total number of each Equipment or product.

This system can also reduce the time taken for the user to find the location of the Equipment due to the bureaucracy or layout of the Equipment in Production Floor. It also can cater for the basic process such as Ship-In, Ship-Out and at the same time capture the users's Identification (ID) and ensure better data management.

Few features has been design into this system to ease user's role such as triggering user using the auto mail, highlight different kind of status using different type of color, security characteristic, tracking all action done by user, maintaining equipment history and lifespan, and generating report and query.

1.7 Conclusion

In conclusion, indirectly low effective equipment parts (motherboards and contactor) can cause several CPV modules problems. Equipment Performance Online Tracking System is a very useful system to fix these problems. It can help to lead to higher equipment stability as well as better equipment performances. Low modules downtime and stable equipment can ensure higher process capability. Even though it does not affect the output of the process directly, the health of the motherboard and contactor is important to the production just like any other key spare part.

The next chapter will be focusing on the System Methodology that has been chosen to develop and improve this system and Literature Review from the proven sources to support system's documentation as well.