THE EXPERTISE SYSTEM DESIGN TROUBLESHOOTING COMPUTER HARDWARE DAMAGE WITH WEB BASE

Sendy Radiana
10106452

Indonesian Computer University
Jl. Dipati Ukur No. 112-116, Bandung 40132
Email : sendyradiana@yahoo.com

ABSTRACT

Number of computer users who lack sufficient knowledge of the handling of hardware damage caused so many computer user or an institution who had spent quite a bit just to repair the damage that occurs in computer hardware. Therefore the application of expert system is designed to help computer users in making an early diagnosis of damage suffered by the computer hardware and solutions to overcome such defects.

This expert system development process knowledge acquisition method of data collection techniques used were interviews, observation and induction rules. While the inference method used in the development of this expert system uses forward chaining method. For software development methodology used is structured method which is Data Flow Diagram and Entity Relationship Diagram .. Programming tools used in this expert system development using Adobe Dreamweaver CS3 while using the MySQL database..

In this expert system application design demands a response from the user input in the form of questions, then the output generated by computers such as the possibility of damage experienced by the hardware, a description of damage and the solutions or suggestions to overcome such defects.

The conclusions obtained by the application of this expert system was able to make early diagnosis of any damage to hardware and provides step solutions to overcome them. From the results of beta testing is done, the application of expert system is considered it looks attractive, easy to use, easy to learn, can help to identify damage, useful, and conclusions and the information presented is accurate.

Keyword : *Expert System, Forward Chaining, Troubleshooting, Hardware*

1. INTRODUCTION

1.1 Background

Lack of sufficient knowledge in handling hardware damage caused most of the general public or an institution can not identify the location of the damage that occurs in computer hardware. So much so that institutions charge a fee large enough only to repair the damage that occurs in the specialist computer hardware troubleshooting hardware. For that felt the need to build a software that can help solve the problem of damage to computer hardware. Software that will be built must be able to present the correct solution, accurate, reasonable and efficient. Believed to be the development and use of appropriate software, each institution can save time and cost that should be spent for purposes that are far more important. Software is a web-based software system that adopts the expert

knowledge that comes from an experienced in the diagnosis and ways of handling hardware damage to computers. With the construction of expert systems troubleshooting web-based computer hardware damage is expected to provide freedom of access anywhere in assisting computer users in dealing with problems in computer hardware to provide an accurate solution, so it can reduce time and costs to overcome the problems of damage computer hardware.

1.2 Aim and Objectives

Based on the problems studied the purpose of this thesis is to build an expert system to diagnose application and provide instruction handling computer hardware.

While the goal of this research are:

1. Building a software expert system for troubleshooting computer hardware damage with a very good diagnostic accuracy.
2. Provide information to the user ease in finding the location of the computer problems that occur on computer hardware without having to hire experts, so that is expected to reduce the cost of repairs if damage occurs.

2. MODELS, ANALYSIS, DESIGN AND IMPLEMENTATION

2.1 Models

Data analysis techniques in the manufacture of software using the modeling software with the paradigm of the waterfall as shown in Picture 1, which includes several processes such as :

a. Requirements Definition

Represents the largest part of the system in progress of a project, started by defining the various needs of all elements of the system and allocate the necessary software into the formation.

b. Analysis

Is the phase of analyzing the things required in the software development project.

c. Design

Translation phase of the analyzed data into a form that is easily understood by the user.

d. Coding

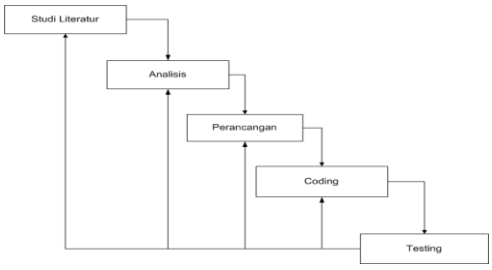
Translation stage data or solving problems that have been designed into a particular programming language.

e. *Testing*

Is the testing phase of software built.

f. Maintenance

Final stage in which a software which has been completed can experience the changes or additions as requested by the user.



Picture 1. Waterfall Development Method

2.2 Analysis

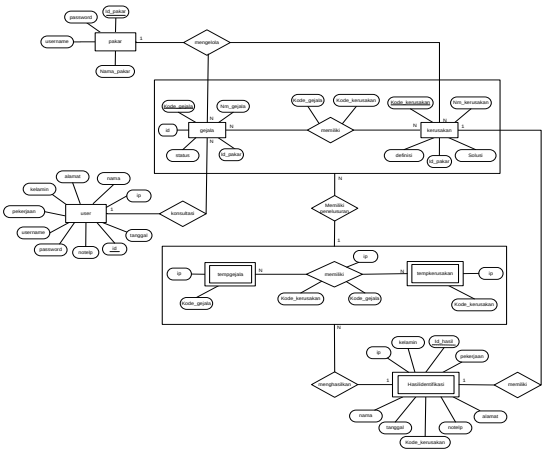
A. System Analysis

Lack of sufficient knowledge in handling hardware damage caused most of the general public or an institution can not identify the location of the damage that occurs in

computer hardware. So much so that institutions charge a fee large enough only to repair the damage that occurs in the specialist computer hardware troubleshooting hardware. Based on the analysis of this problem, so through this thesis, an alternative presentation of information and consultation about the damage that occurs in the form of hardware along with a reference solution to the problem of troubleshooting steps damage the hardware.

B. Database Analysis

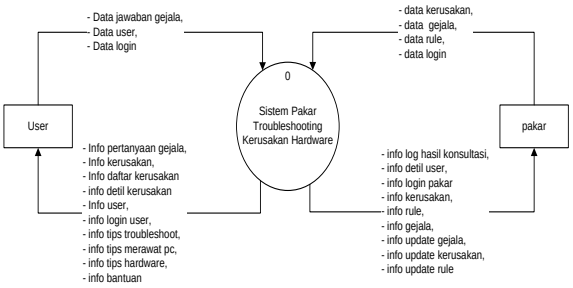
Entity Relationship Diagram (ERD) is a way to organize data, which will show the relationship diagram of entities contained in the system. ERD is proposed for the system to be built can be seen in the figure 2 below.



Picture 2 *Entity Relationship Diagram* (ERD)

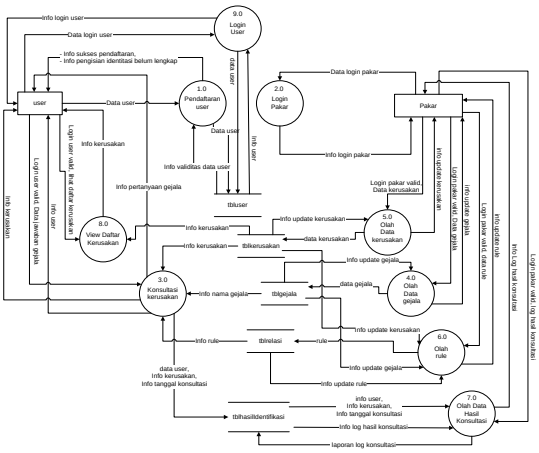
C. Functional Needs Analysis

1. Diagram Context



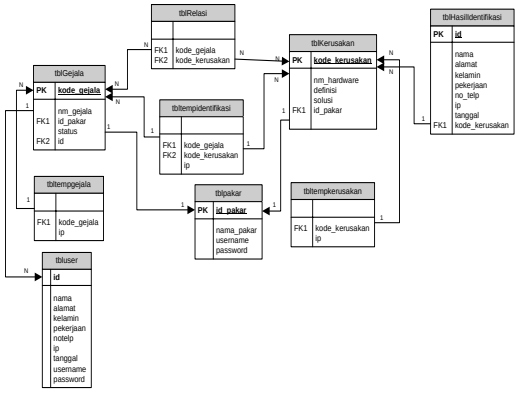
Picture 3 Context Diagram

2. DFD Level 1



Picture 4 DFD Level 1

3. Schematic Diagram



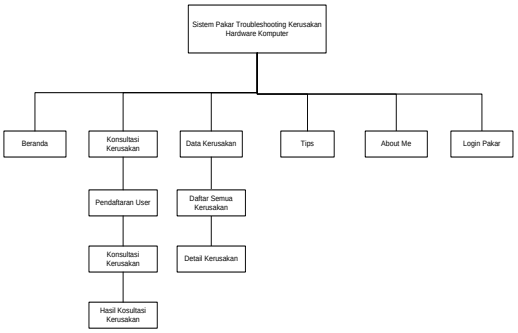
Picture 5. Schematic Diagram

2.3 Design

A. Menu Structure Design

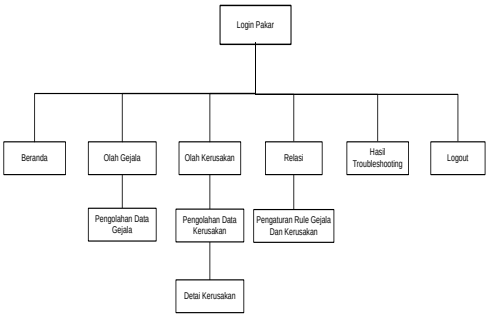
The design structure of the menu and submenu contains menu that serves to facilitate users in using the system. menus are then divided according to the permissions of each user. Here is an overview of the menu structure Troubleshooting Expert System for Computer Hardware Web-Based Damage.

1. User Menu Structure



Picture 6. Design User menu Structure

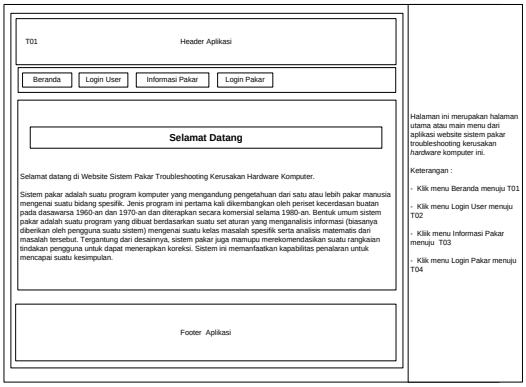
2. Expert Menu Structure



Picture 7. Design Expert Menu Structure

B. Main Menu Design

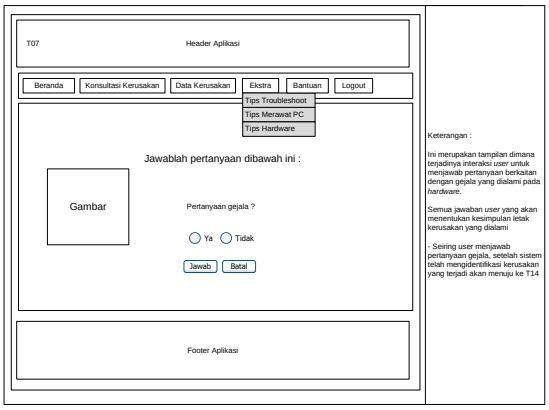
Here is a picture design of the main menu.



Picture 8. Display Design Main Menu

C. Design View User Consultation

Here is a picture design in user consultation

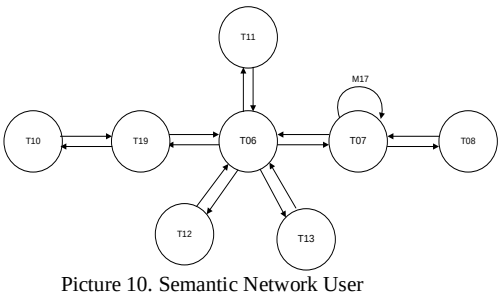


Picture 9. Display Design Consultation User Menu

D. Semantic Network

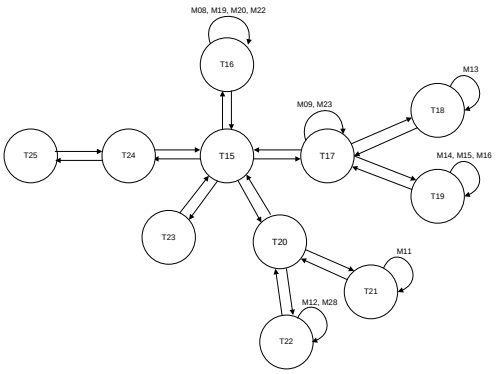
Semantic network is an effective tool for presenting data mapping, which aims to prevent duplication of data. Semantic networks on expert system applications are divided into semantic networks and semantic networks expert user.

1. Semantic Network User



Picture 10. Semantic Network User

2. Semantic Network Expert



Picture 11. Semantic Network Expert

2.4 Implementation

Implementation stage is the stage of translating the system design based on an analysis in a language that is understandable by machines as well as application software on the actual circumstances.

A. Hardware Implementation

The hardware used in construction applications web-based troubleshooting hardware damage has the following specifications :

1. *Notebook* with Intel atom N280 speed 1,67 GHz processor
2. Hard disk Capacity 160 GB
3. *RAM* Capacity 1GB
4. *VGA* Capacity 256 MB
5. *Keyboard* and *Mouse*

B. Software Implementation

The software applications used in the manufacture of a web-based troubleshooting hardware damage has the following specifications :

1. *Microsoft Windows XP Home Edition service pack* 3 Operating system.
2. In designing the database using *MySQL*.
3. Using the PHP programming language editors with the tools Adobe Dreamweaver CS3.

C. Interface Implementation

Implementation describes the display interface from the implementation of the application built an expert system interface troubleshooting web-based computer hardware damage. Here is the implementation of the interface of the application that is built can be viewed at the following :

Table 1. Interface Implementation

Menu	Description	File Name
Main Menu Form	The main menu displays the program files from the user's hardware damage troubleshooting expert system	index.php
user registration form	Program files for user registration	konfirmasi.php
Consultation Form damage	Program files that display the symptoms of questions for users	identifikasi.php
Form data damage	File program to provide information about damage to hardware and solutions to address them	solusiuser.php
Form about me	Program files to display author information applications and tools used to build an expert system application troubleshooting hardware damage	info.php
Troubleshooting Tips	Program files to display tips for troubleshooting.	tips.php

Expert login form	Expert login program file for	login.php
User login Form	Program files for users who already have a login account	loginuser.php
Account Management Forms	Program files to change the password expert	gantipassword.php
Form data if symptoms	Program files that are access rights experts whose function is to add, modify and delete data symptoms	masalah.php
Form data if the damage	Program files that are access rights experts whose function is to add, modify and delete data damage	solusi.php
Form if the rule	Program files that are access rights expert who works to create, modify and delete rules.	relasi.php
Form the log results consultation	Program files that are access rights experts, which shows the consolidated results of user consultation with data users who do consulting.	log.php
Form a user logs detail	File program that displays the detailed report of data users who do consulting	logdtl.php

3. RESULT AND DISCUSSION

Based on the above percentage results obtained from beta testing, which was distributed to 30 people who say that software built is easy to use, easy to learn, attractive user interface, quite helpful in identifying the damage, the symptoms and damage on this application in accordance with reality, and produce a fairly accurate conclusion.

4. CONCLUSION AND SUGGESTION

4.1 Conclusion

After doing the analysis, design and testing, it can be concluded as follows:

1. Application troubleshooting expert system computer hardware damage this can do to an early diagnosis of damage and the solutions proposed to overcome such defects
2. Application troubleshooting expert system computer hardware damage was at least able to help minimize the expenditure of money to repair damage to hardware.
3. The use of forward chaining method is very suitable for use in expert system troubleshooting hardware damage is basically a user application does not know where the damage occurred.

4.1 Suggestion

Troubleshooting expert system application to damage computer hardware is better going forward, so that it can be suggested are :

1. The scope of the system in identifying a fault can be developed into a wider and more complex, especially the emphasis on the questions of symptoms which can lead to the conclusion that more accurate and can handle a fairly complex hardware problems.
2. Using the method of certainty factor to know the percentage of beliefs from the damage the hardware which has been identified, so that more accurate conclusions.
3. Hardware solution presents a more detailed damage with handling steps and is accompanied by detailed picture.

5. DAFTAR PUSTAKA

[1] Sommerville, Ian, *Software Engineering*, Erlangga, Edisi 6, Jakarta , 2003.

[2] Kusumadewi, Sri, *Artificial Intelligence*. Graha Ilmu, Edisi Pertama, Yogyakarta, 2003.

[3] Arhami, Muhammad, *Konsep Dasar Sistem Pakar*, Andi, Edisi Pertama, Yogyakarta, 2005.

[4] http://student.eepisits.edu/~tasa/upload+download/File%20yang%20disediakan/Nety%20Puspitasari.doc

[5] Kusrini, *Sistem Pakar Teori dan Aplikasi*. Andi, Edisi Pertama, Yogyakarta, 2006.

[6] Jogiyanto, Hartono, *Pengenalan Komputer*, Andi, Edisi Pertama, Yogyakarta, 2002.

[7] Wedjo, Silvester S., *Mengatasi Masalah Hardware Komputer*, Mediakita, Edisi Pertama, Jakarta, 2007.

[8] Wahyono, Teguh, *PC Troubleshooting Plus*, Gava Media, Edisi Kedua, Yogyakarta, 2008

[9] Nugroho Bunafit. *Membuat Aplikasi Sistem Pakar*, Gava Media, Edisi Pertama, Yogyakarta, 2008.

[10] Nugroho Bunafit, *Aplikasi Pemrograman Web Dinamis dengan PHP dan MySQL*, Gava Media, Edisi Pertama, Yogyakarta, 2004.

[11] Sugiyono, *Metode Penelitian Kuantitatif Kualitatif dan R&D*, Alfabeta, Edisi Kedua, Bandung, 2001.

[12] Hakim, Lukmanul, *Trik Rahasia Master PHP Terbongkar Lagi*, Lokomedia, Edisi Pertama, Yogyakarta, 2009.