



Flash Damage Expert System Using the Dempster Shafer Method

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ABSTRACT

The rapid development of technology makes it easy to solve problems and get satisfactory results for the lives of many people. An expert system is a branch of artificial intelligence that is designed by embedding the knowledge of an expert in a computer. Expert systems can replace the role of an expert by using a computer that can provide definite solutions like an expert. In writing this thesis it is explained how a computer can detect damage from a flashdisk and the solution to the resulting damage like an expert using the Dempster Shafer calculation method. This expert system program is implemented using the Microsoft Visual Basic 2010 programming language with SQL Server 2008 database as the storage medium.

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1. INTRODUCTION

Today, computer technology has increasingly developed in its use. At first the computer was used as a calculating tool (Rachmadi & Kom, 2020), (Dunya & Syarah, 2022). Along with the times, computers are widely used in various fields. For example in the automotive, health and so on. One of the uses of computer technology is that it can be used for expert systems (Cholic, 2021), (Aditya, 2018). An expert system is a system that seeks to adopt human knowledge into computers, so that computers can solve problems as experts usually do. Expert systems are usually used for consulting (Russari, 2016), perform analysis and diagnosis, assist decision making, and others. One of the implementations of an expert system in the field of technology is knowing the damage to the flash drive (Am, 2022), (Wicaksana & Santoso, 2019).

Flash technology already has a large capacity and is increasingly sophisticated, however, it does not rule out that the flash is free from damage (Nurofik et al., 2021). In fact, according to several sources, flashdisk is a hardware device that is vulnerable to damage, ranging from minor damage that can still be repaired by itself, to severe damage that can no longer be repaired. (Purba, Ak, Yando, & SE, 2020). However, flash drives can last a long time if they are cared for properly, and don't ignore minor damage (Rahutami & Suwarno, n.d.).

With this increasing demand, of course flashdisk users hope to use it for the long term. For this reason, flashdisk owners must pay attention to maintenance, because flashdisks also depend on maintenance and the owner's habits in using flashdisks. But not all flash users pay attention to maintenance on flash hardware. Most flashdisk users only understand how to use it, without paying attention to how to care for it (Rizal, n.d.), (Sasaki, 2018). Even though doing more maintenance can reduce flash damage.

By paying attention to the background of the problems above, this program was designed. So that this program is expected to be used as a guide that presents various solutions for flashdisk users (Zein, 2019). In this program various repair solutions for minor damage will be provided, so that flashdisk owners can fix it themselves and avoid unwanted difficulties. In addition, this program also provides basic knowledge about flashdisks, so that flashdisk owners know the symptoms of damage and how to handle it (Purnasari, 2019), (Rusdiyanto, n.d.).

2. RESEARCH METHOD

Research methodology is a process, namely a series of steps that are carried out in a planned and systematic way in order to find solutions to problems or get answers to certain questions. The Research Methodology can be in the following procedure

2.1 Existing System Analysis

The method used by the author in conducting research related to the title of the thesis is to use the needs analysis method. Software requirements analysis is the initial activity of the software development cycle. The analysis stage is the stage of collecting requirements from all elements of the system. software to be built. In obtaining the data needed in the needs analysis, the authors use 2 (two) study methods in data collection, namely:

a. Field Study

Is a method that is carried out by conducting direct field studies to collect data, namely direct observation of the study location. The data collection techniques from the field studies carried out are.

a) Observation

Direct Observation (Observation). Direct Observation (Observation) is a data collection method that is quite effective for studying a system.

b) Interview

The interview is part of a field study that interacts directly with the resource person through a number of questions related to thesis writing. Interviews were conducted with an informant named Mr. Surianto, Amd as a computer technician and computer instructor at the non-formal educational institution Victory Education Center. there are many questions asked by the author, one of which is "What are the common causes of flash damage & how to fix it?"

b. Library Studies (Library Research)

The author conducted a literature study to obtain data related to thesis writing from various reading sources such as books on research methods, expert system programming and SQL Server 2008 database design.

3. RESULTS AND DISCUSSIONS

3.1 Results Display

a. User selection form

In this form display a user is required to choose whether to be an administrator or just an ordinary user, if choosing a user user then that person or user can only consult and view the about form while in the administrator's choice, the user has full rights over the program being run. Can be seen in Figure 1. below:



Figure 1. User Selection Form

b. Flash damage symptoms form

This form can only be accessed if in the user sorting form, the administrator is selected. In this form a user can add, edit & delete symptom data. The following is a picture of the flash damage symptom form.

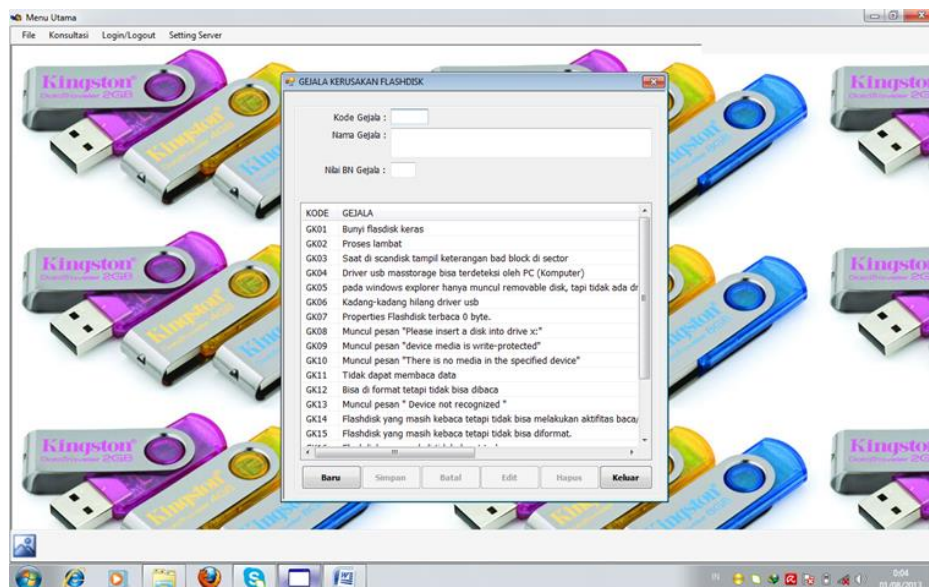


Figure 2. Flashdisk Damage Symptom Form

c. Rule base input form

This form contains a rule base data that contains the names of damage from flashdik and their symptoms. In this form an admin can add new rules / types of damage by entering symptoms that match the type of damage along with solutions for the damage experienced. Below is an image of a rule base input form.

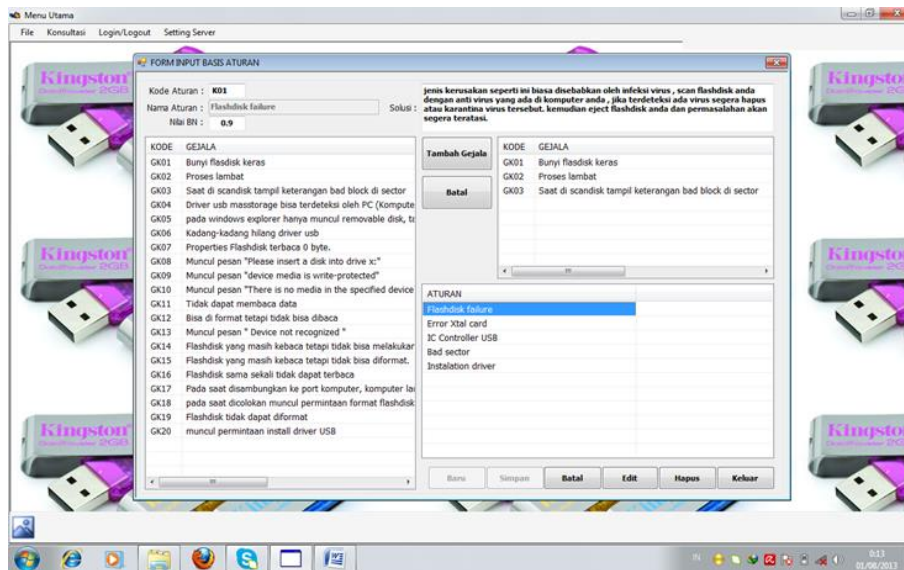


Figure 3. Rules Base Input Form

d. Consultation form

This consultation form contains symptoms of flash drive damage that the admin has previously entered into the symptom data form which will then be used by the user to consult with the symptoms of the damage experienced. Below is a picture of the consultation form.

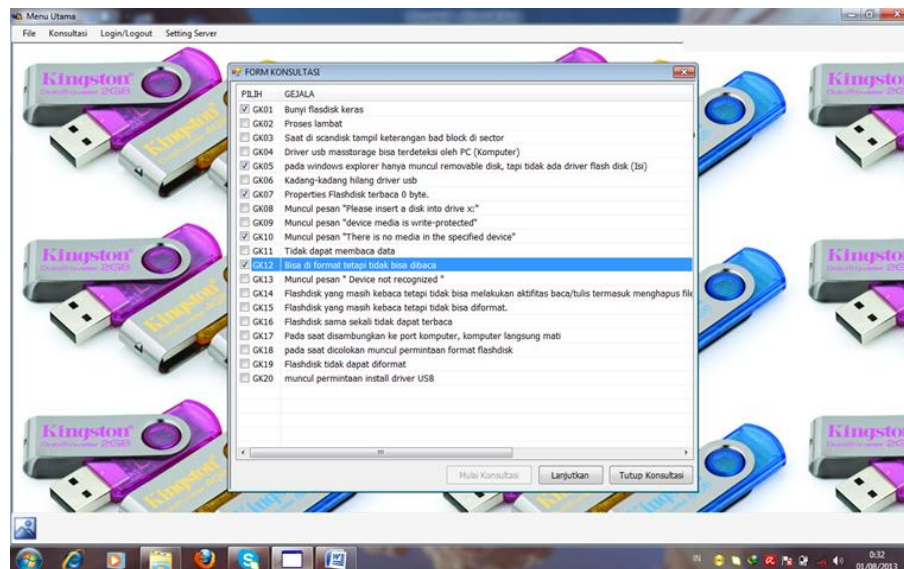


Figure 4. Consultation Form

e. Consultation results form

This form is a form that contains the consultation results of the symptoms that have previously been selected from the consultation form. The appearance of this form is the output of the program being run where this form contains the name of the previously selected symptom, the results of calculating the level of confidence (Density) using the Dempster Shafer method, the type of flash damage from the pre-selected symptoms & the solution to the type of damage the flash drive. The following is a picture of the consultation results form.

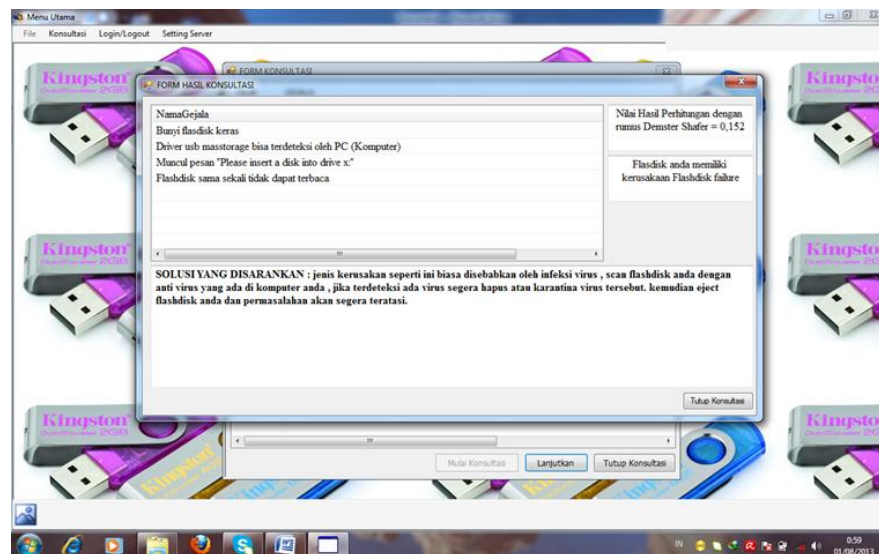


Figure 5. Consultation Result Form

4. CONCLUSION

After the writer has conducted research related to the title of the thesis about the analysis of flash damage, the writer can draw conclusions based on the identification of the problems that have been summarized in chapter I. The conclusions that can be explained by the writer are as follows. With this system, it can increase the knowledge of flashdisk users about damage & repair solutions. From an economical point of view, it is hoped that this system can save user costs in flash disk repair problems. Based on the research conducted by the author, this system is the only expert system that detects flash damage, because most of the existing expert systems focus more on health problems.

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