

## **DESIGN OF DECISION SUPPORT SYSTEM DAMAGE DIAGNOSIS OF HONDA BEAT MOTORCYCLE MATIC USING FORWARD CHAINING METHOD**

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### **ABSTRAK**

An expert system is a system that seeks to adopt human knowledge to a computer that is designed to model problem solving abilities like an expert (Durkin, 1994). The three main components contained in any expert system are the knowledge base, the inference engine, and the user interface. Forward chaining is a strategy to predict or find a solution to a problem that starts with a set of known facts, then derives new facts based on rules whose premises match the known facts. This process is continued until the goal is reached or there are no more rules whose premise matches the known facts. The system maker application media uses PHP and MySQL as databases

**Keywords:** Expert system, Forward chaining, Honda beat motorcycle.

### **1. INTRODUCTION**

Honda Beat motorcycle is a motorcycle with CVT (Continuously Variable Transmission) technology or an automatic engine which is a continuous transmission acceleration technology according to the engine speed. With advances in information technology, the author intends to create an expert system for detecting motorcycle damage which aims to help motorcycle users find ways to deal with damage to motorcycles without having to go to a repair shop.

In general, an expert system is a computer program that imitates the reasoning of an expert with expertise in a particular area of knowledge (Turban, 2005). The use of expert systems can be easily and efficiently implemented into machine language using the Forward Chaining method. The Forward Chaining method is a tracing process that begins by displaying a collection of data or convincing facts towards the final conclusion (Hartati, 2008).

According to Feigenbaum in Harmon and King (1985), expert systems are intelligent computer software that uses knowledge and inference procedures to solve problems that are quite complex or require the ability of an expert to solve them. An expert system is computer software that uses knowledge (rules about the nature of the elements of a problem), facts and inference techniques for problems that usually require the ability of an expert. Expert systems work based on knowledge entered by one or several experts in order to collect information until the expert system can find the answer. This application is made using the PHP programming language, MySQL as the database, and the software used are: Adobe Dreamweaver and Apache. The choice of location for the construction of the right service center location is a problem that is being faced by PT. Eltra Various Techniques Semarang. Leaders feel confused in determining the right location for the construction of a service center because there are many things that must be considered so that the construction is not in vain and can overcome company problems. This decision support system is able to provide convenience for company leaders in determining the right service center location, through appropriate calculation processes and an integrated system with Geographic Information System (GIS) that can point to locations directly online. The results obtained are Tunjungan Elektronik Center with a value of 97.00, ITC Mega Wholesale with a value of 87.00, Galaxy Mall with a value of 86.00, Delta Plaza with a value of 85.00, Hi-tech Mall with a value of 84.00, Citra Wold Surabaya with a score of 83.00 so that the alternative chosen is Tunjungan Elektronik Center with the highest score of 97.00.

In exchange for the increase in subsidized fuel, the government created a financial assistance program called the Community Temporary Direct Assistance (BLSM). The target recipients of BLSM are underprivileged households who will later be selected and given a KPS card (social protection card) as proof of being a legitimate member of the target household (RTS). Based on data from the Central Statistics Agency (BPS), the last determination of RTS members was carried out in 2011, referring to the criteria/indicators of poverty on a national scale as determined. Since that year, no data collection and re-assignment of RTS members has been carried out and until now the data is still being used for the distribution of aid funds. This condition triggered the misappropriation of aid funds because during these three years (2011-2014) there must have been changes in the condition of the residents. Conditions where there are RTS members who have died, changed addresses, or changed economic status. Not to mention the Central Statistics Agency (BPS) as a population data collection agency in selecting RTS candidates using national-scale criteria. This tends to produce an inaccurate selection result, because each region in Indonesia has different socio-economic conditions.

Decision Support System (Decision Support System) itself is part of a computer-based information system that is used to support decision making in solving various problems, whether structured, semi-structured, or unstructured.

Meanwhile, the AHP (Analytical Hierarchy Process) method is applied for classification, especially for community classification.

The criteria used for classification are: housing, food, empowerment, income, dependents, and education (Supriyono, 2012).

The concept of AHP is to change qualitative values into quantitative ones, so that the decisions taken can be more objective. The main tool is a functional hierarchy with the main input being human perception. The existence of a hierarchy allows complex problems to be broken down into sub-problems, then arrange them into a hierarchical form (Kusrini, 2007).

In this application, there is a menu for setting the data collection period. The aim is to regulate the period of each data collection carried out annually, in order to make it easier for officers to store data periodically in order to get data accuracy up to date.

## 2. LITERATURE REVIEW

AHP is a basic approach to decision making. In this process of making decisions using Pairwise Comparison Judgment which is used to form all priorities to determine the ranking of alternatives. The main tool of this model is a functional hierarchy with human perception as the main input.

Decision support system (Decision Support System) is an interactive information system that provides information, modeling and manipulating data. The system is used to assist decision making in structured and unstructured situations. (Agus Komarudin, 2012)

The assessment indicators in the SPK for determining BLSM acceptance and their sub-criteria are as follows:

- a. Floor type : Soil, Plaster, Ceramic
- b. Wall type : Woven bamboo, Kalimantan wood planks, semi-permanent walls, imperfect walls, teak wood planks, perfect walls, terraced walls
- c. Assets : < 500 Thousand, 500 Thousand - 1 Million, > 1 Million - 2 Million, > 2 Million
- d. Building area : < 24 M2, 24 M2 - 35 M2, > 35 M2 - 50 M2, > 50 M2
- e. Dependent on children's education costs: No dependents, < 600 thousand, 600 thousand - 1 million, > 1 million - 2 million, > 2 million
- f. Income : < 600 Thousand, 600 Thousand - 1 Million, > 1 Million - 2 Million, > 2 Million
- g. Age: Young (< 40 years), Middle-aged (40 - 55 years), Old (> 55 - 70 years), Very old (> 70 years)

HTTP is a protocol that is widely used on the Internet for exchanging files or other data (often called resources) on the World Wide Web using a browser.

The source of the browser is called the HTTP client, while the provider on the web page accessed by the browser is called the HTTP server (web server). The resource to be accessed has an address called the Universal Resources Locator (URL). Resources referred to here can be in the form of files, the output of a program (such as PHP), query results from the database server and others.

According to Bunafit Nugroho (2004), in the book "Dynamic Web Programming Applications with PHP and MySQL", the WWW or what is often called the World Wide Web is a part of the internet that is very well known in the internet world, with the WWW a user can display a Virtual page called the Website.

PHP stands for HyperText Preprocessor which is used as a server-side scripting language in Web development that is embedded in HTML documents.

Apache is a derivative of the Web Server that was developed by NCSA (National Center for Supercomputing Application) around 1995, known as the NCSA HTTP Daemon (NCSA HTTPd) which on RedHat Linux 7.1 has used a patch to replace the NCSA HTTPd. On RedHat Linux 7.1, Apache is using version 1.3.19 with release 5, or better known as the apache-1.3.19-5.i386.rpm package.

### **3. RESEARCH METHODOLOGY**

To be able to produce certain products, research that is needs analysis is used, and to test the effectiveness of these products so that they can function in the wider community, research and development methods are needed. The steps of the research and development (R&D) method that the author uses as a reference in building and developing products are as follows (Sugiyono, 2008)

According to Borg and Gall (1989: 624), educational research and development is a process used to develop and validate educational products. Or it can be interpreted that development research is a process used to develop and validate educational products. The results of development research are not only the development of an existing product but also to find knowledge or answers to practical problems. Research and development methods are also defined as a research method used to produce certain products, and test the effectiveness of these products (Sugiyono, 2011: 297).

There are six steps used in this study, namely as follows:

- a. Research and information collecting. Included in this step are the study of literature related to the problems studied, and preparation for formulating a research framework.
- b. Planning. This step includes formulating skills and expertise related to the problem, determining the objectives to be achieved at each stage, and if possible/necessary carrying out a limited feasibility study, thinking about what products will be produced.
- c. Develop preliminary form of product, which is developing the initial form of the product to be produced. Products can be algorithms, program designs, program models. Included in this step is the preparation of supporting components, preparing guidelines and manuals, and evaluating the feasibility of supporting tools. This design product, if necessary, minimal validation of supervisors and or colleagues who master the problems being programmed should be carried out.
- d. Preliminary field testing, namely conducting initial field trials on a limited scale. by involving the subject sufficiently. In this case, at least a supervisor, or a colleague who mastered the programmed problems. At this step data collection and analysis can be done by means of interviews, observations or questionnaires to cross check between those designed and the application that has met or not.
- e. Main product revision, namely making improvements to the initial product produced based on the results of the initial trial. This improvement is very likely to be carried out more than once, according to the results shown in a limited trial, so that the main product (model) draft is ready to be tested more widely.
- f. Main field testing, the main test involving stage holders. Here, the output of the running program can be tested by obtaining approval from the research scope.

### **4. CONCLUSIONS AND SUGGESTIONS**

Based on the results of the design, implementation and testing of a decision support system for determining BLSM acceptance using the Analytical Hierarchy Process (AHP) method, the results of a KRT (head of household) ranking are quite valid with a percentage of 78.9%. The research resulted in a decision support system application for determining BLSM acceptance using the AHP method by applying indicators that were adapted to the conditions of each region.

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