



Expert System for Fault Diagnosis of Hoisting Crane Machines

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ABSTRACT

Considering the dangers that may arise from damage to the hoisting crane machine, damage can load which happens to fall so that it can cause damage not only to the load but also to the human soul associated with it. Because this is me who submitted an approved application for software that has been specifically designed to be able to diagnose damage to a hoisting crane machine. Through several studies on one of the hoisting crane machinery companies namely PT. Engineer Budi. There is on the construction of an expert system to assist experts in carrying out their routine tasks in analyzing the damage to machines that lift cranes.

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1. INTRODUCTION

Material handling equipment is an integral part of the mechanical equipment in any modern industrial venture. In each company the overall production process is very much determined by the selection of the right type of material handling equipment, for certain loading and unloading operations, the material handling mechanism is equipped with a clamping device, especially those operated by auxiliary machines, namely hoisting cranes, gantry cranes and many other types - type of chuck for lifting heavy objects in industrial factories[1].

Given the dangers that may arise from damage to the hoisting crane machine, the damage can cause the load being lifted to fall so that it can cause damage not only to the load but also threaten human lives. Because of this, a specially designed software is needed that can diagnose damage to a hoisting crane machine, namely an expert system. In addition to the development of hoisting cranes, science has also developed that is able to adopt the human way of thinking[2].

When the knowledge representation (RP) in the knowledge base is complete, or at least it is at a sufficiently accurate level, the RP is ready to use. The inference engine is a module that contains programs on how to control the reasoning process. There are two important inference methods in expert systems, namely forward chaining and backward chaining[3].

Previous research on an expert system for diagnosing measles in children stated that the diagnosis process carried out by doctors can be applied to the system properly, where the manual results with representation into the system are very accurate[4].

2. RESEARCH METHOD

To complete this research, the authors conducted several research methodologies to solve these problems. The research methods in data collection are:

1. Field Research (Field Research)

This research method is carried out directly on the object of research, data and information collected is done by:

Obeservation (Observation) This activity is carried out to obtain general data related to the object of research by looking directly, observing and recording the current system and seeing the formats that have been used so far.

2. Library Research

In this case the author collects references related to research with library sources that will be used as a theoretical basis from both journals, online and offline reading books.

The design of the menu structure contains menus and submenus which serve to make it easier for users to use the system[5]. The menus are divided based on the permissions of each user. The following is an overview of the menu structure of the Damage Diagnosis Expert System on a crane machine[6].

3. RESULTS AND DISCUSSION

On the Expert System Page View the user selects the type of damage, namely the crane is running abnormally, then clicking the process button, then the diagnosis page will display. Where to explain a question "whether any rail is broken". The display of the type of damage page can be seen in Figure 1 below:



Figure 1. Display Select Type of Damage

The testing process on the Damage List Page Display is the result of data on the type of damage that has been inputted. If an admin wants to add data, it is also contained in the Damage List Page View the add data button just click.

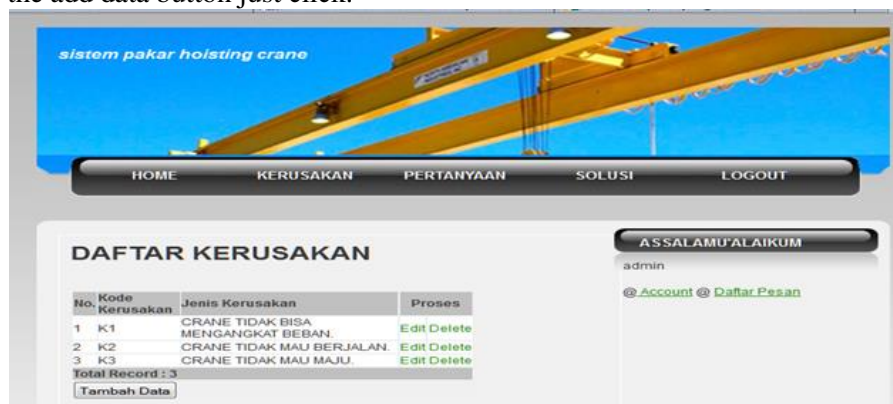


Figure 2. Display of the Damage List

The question data page functions to edit the knowledge base such as adding, deleting and changing symptom questions. The page display of the symptom list is the result of the damage symptom data that has been inputted, if an admin wants to add data, it is also contained in the Damage List page view the add data button just click.

No.	Kode Pertanyaan	Pertanyaan	Fakta Ya	Fakta Tidak	Ya	Tidak	Kode Kerusakan
1	T1	APAKAH PULI PULI SLING SLING MASIH MASIH BAGUS ?	BAGUS.	PULI SLING SUDAH PECAH.	T2	S5	K1
2	T2	APAKAH PUSH BOTTON ALAT PENGENDAL MASIH BAGUS ?	PUSH BOTTON MASIH BAGUS.	PUSH BOTTON SUDAH RUSAK.	T3	S1	K1
3	T3	APAKAH SLING SLING MASIH MASIH BAGUS ?	BAGUS.	SLING SUDAH RUSAK.	S4	S2	K1
4	T4	APAKAH PUSH BOTTON DANDAN KABEL MASIH MASIH BAGUS ?	PUSH BOTTON BAGUS.	PUSH BOTTON DAN KABEL SUDAH RUSAK.	T5	S9	K2
5	T5	APAKAH REL MASIH REL MASIH	REL MASIH	REL SUDAH	T6	S3	V7

Figure 3. Display of Question List

The solution list page functions to edit the knowledge base such as adding, deleting and changing solutions. The solution list page display is the result of damage symptom data that has been inputted, if an admin wants to add data, it is also contained in the solution list page view the add data button just click.

No.	Kode Solusi	Solusi	Proses
1	S1	KERUSAKAN YANG TERJADI PADA PUSH BOTTON YANG SUDAH RUSAK ATAU TIDAK BERFUNGSI LAGI, MAKA TUKAR DENGAN PUSH BOTTON YANG BARU.	Edit Delete
2	S10	SEGERA DI GANTI DENGAN CONTACTOR MAGNIT YANG BARU.	Edit Delete
3	S11	SEGERA CEK RANGKAIAN LISTRIK PUTAR KANAN NYA YANG ADA PADA PANEL CONTACTOR MAGNIT, KEMUNGKINAN KABEL ADA YANG LEPAS DAN LONGGAR.	Edit Delete
4	S2	KERUSAKAN YANG TERJADI PADA KAWAT TALI BAJA (SLING) YANG PUTUS SERABUTNYA SEGERA TUKARKAN DENGAN KAWAT YANG BARU DAN LAKUKAN PELUMASAN PADA	Edit Delete

Figure 4. Solution List View

4. CONCLUSION

After analyzing, designing, and testing, a conclusion is drawn that this application built makes it easy for users and hoisting machine experts (mechanics) to find convenience in analyzing damage quickly and accurately, where this application can provide consultation facilities for users to diagnose hoisting crane damage. This expert system application of fault diagnosis on hoisting crane produces fairly accurate identification conclusions in terms of diagnosing the damage.

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