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Expert System Application to Diagnose Degenerative Diseases Using Methods Certainty Factor

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Abstract: Degenerative diseases are diseases that cause damage or destruction to body tissue or organs that arise due to a decrease in the function of one or more of the body's organs which are very susceptible to elderly people. Considering the large negative impact of degenerative diseases, it is necessary to prevent or seriously treat the dangers of degenerative complications. Efforts to minimize this danger can be made by increasing public awareness about things that can cause degenerative diseases. Therefore, we need a system that can help as an alternative to consulting a doctor for the general public. Therefore, this expert system was built using the Certainty Factor method which can be used as a solution in using an expert system to diagnose this Degenerative disease. In its application, the certainty factor method can provide a percentage level of confidence in a disease, if the user has or selects symptoms so that they can determine the type of disease they are suffering from. Based on the tests carried out, it can be concluded that this expert system application can be used by users to make an early diagnosis of degenerative diseases. This expert system can be accessed at the link www.sp_Degenerative.com. Making it easier for users to consult.

Keywords: Expert System, Certainty Factor, Degenerative.

Introduction

Degenerative diseases are diseases that cause damage or destruction to tissues or organs that arise due to a decrease in the function of one or more organs that are very susceptible to being experienced by people of advanced age Anis, (2019). Hypertension, diabetes mellitus, stroke, and cancer are some of the diseases referred to as degenerative diseases. Degenerative diseases must be identified immediately so that the treatment process can be carried out quickly so that the disease does not get worse. Considering the magnitude of the adverse effects of degenerative diseases, it is necessary to prevent or seriously handle the dangers of degenerative complications. Efforts to minimise these dangers can be done through increasing public awareness about things that can cause degenerative diseases (Guan, 2024).

Therefore, a system is needed that can help as an alternative to consulting a doctor for the general public. By looking at the description of the problems above and the development of the world of information technology (IT) today, these problems can be resolved using an information technology (IT) approach. This is because the role of IT has

entered almost all fields of life without exception in the field of medicine. Currently, the field of Artificial Intelligence (AI) or artificial intelligence has developed which studies and is able to imitate human intelligence. One of the scopes of AI is an expert system, an IT technology that imitates an expert, to help ordinary people. In this case, a doctor can be said to be an expert because he is an expert in his field and has abilities that are not possessed by others (Muda, 2024).

The application is built with a knowledge system from an expert and a problem processing system that interacts with each other. So as to be able to analyse symptom data carefully to conclude the results of the diagnosis of degenerative disease types in humans. This application is expected to be able to diagnose early types of degenerative diseases.

Methodology

Actual System Analysis

The system analysis carried out in making this expert system is to identify the symptoms that occur. Due to the lack of experts to deal with the problem. Therefore, an expert system is designed that can diagnose this degenerative disease using the PHP programming language and MySQL Database. So that it can substitute expert knowledge into the system. And can be used if there is a shortage of medical personnel or doctors are not in place.

New System Analysis

Data analysis is a stage for analysing the data that will be processed for the design of the system to be created, with the first step the user will open the system, the main page will appear, after which the user clicks on the diagnosis form, the user must fill in the login form to consult with the system. After successfully logging in, a form will appear containing questions.

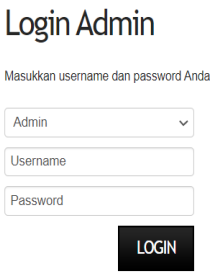
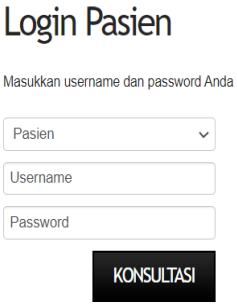
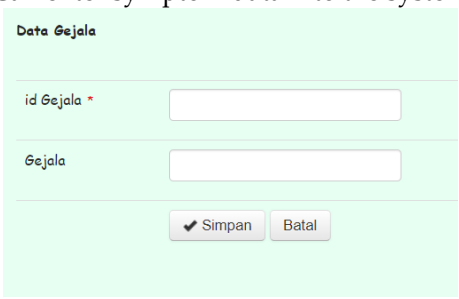
Each question will be answered by the user according to what the user is experiencing. After the question is answered, the disease analysis result form will appear. If the answer is not detected that cannot be analysed by the system, then try to consult directly with a doctor (Hasan, 2024).

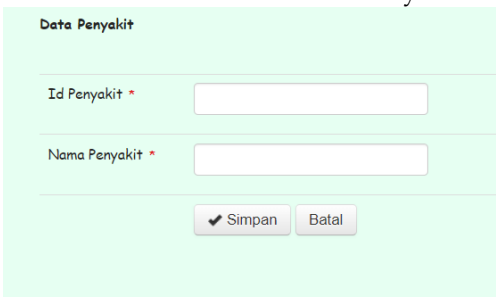
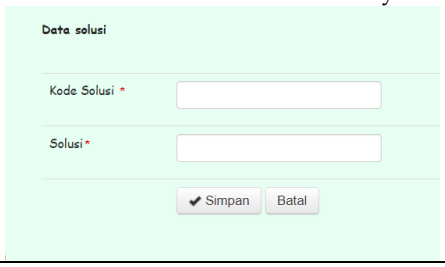
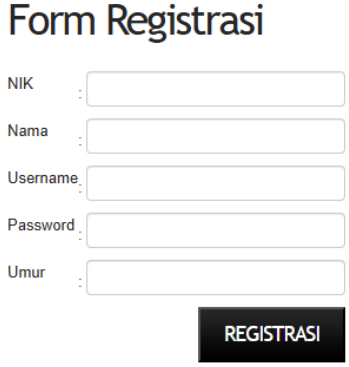
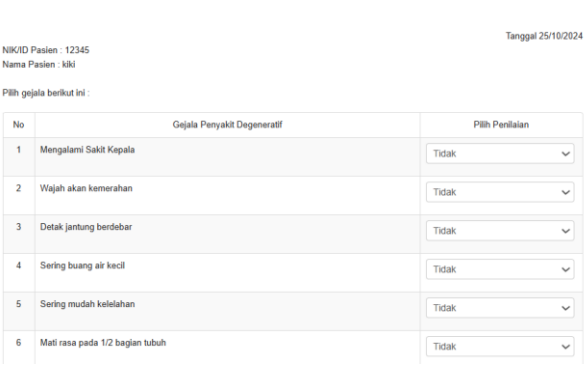
Result and Discussion

Black Box Testing

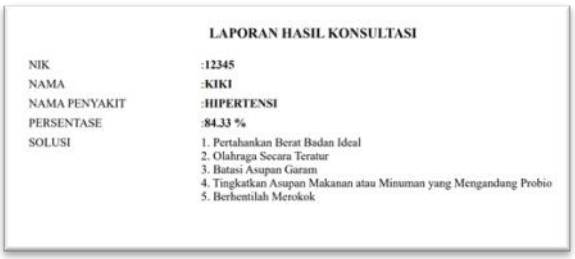
Testing in this study was carried out by the admin, the test method used was black box testing. Black box testing is testing the fundamental aspects of the system without regard to the internal logic structure of the software. This method is used to find out if the software is functioning properly (Qin, 2024). Black box testing is a method of designing test data based on the specifications of the software being made. The Black Box testing carried out is as follows:

Table 1. Black Box Testing

Testing	Expected	**Observation**
Admin Login	Will display admin login form 	[✓] Successful [ ] No
Patient Login	Will display patient login form 	[✓] Successful [ ] No
	Can enter symptom data into the system 	[✓] Successful [ ] No

Symptom Data Input	Can enter disease data into the system 	[✓] Successful [ ] No
Disease Data Input	Can enter solution data into the system 	[✓] Successful [ ] No
Solution Data Input	Can enter solution data into the system 	[✓] Successful [ ] No
Registration	Users can consult with the system 	[✓] Successful [ ] No

Consultation	Consultation results	[✓] Successful [ ] No



LAPORAN HASIL KONSULTASI

NIK	:12345
NAMA	:KIKI
NAMA PENYAKIT	:HIPERTENSI
PERSENTASE	:84.33 %
SOLUSI	1. Pertahankan Berat Badan Ideal 2. Olahraga Secara Teratur 3. Batasi Asupan Garam 4. Tingkatkan Asupan Makanan atau Minuman yang Mengandung Probio 5. Berhentilah Merokok

Based on the tests carried out, it can be said that there are no more errors in the system. So that this Degenerative disease expert system can be used properly.

Discussion

This section should explore the significance of the results of the study. A combined Results and Discussion section is also appropriate. This section allows you to offer your interpretation and explain the meaning of your results. Emphasize any theoretical or practical consequences of the results (Krisbiantoro, 2024).

The Discussion section should be a reasoned and justifiable commentary on the importance of your findings. This section states why the problem is important; what larger issues and what propositions are confirmed or disconfirmed by the extrapolation of these findings to such overarching issues.

Conclusion

Based on the results of the tests that have been carried out, it can be concluded that this expert system for diagnosing degenerative diseases was created using the PHP Programming Language and MySQL Database. This expert system can be used as an initial solution in consulting about degenerative diseases online. In its application, the Certainty Factor method can provide a percentage of degenerative diseases suffered. So that users can make this expert system as one of the applications that can provide assistance in early diagnosis of degenerative diseases.

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