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Expert System for Diagnosing Diseases in Children Using the Bayes Theorem Method

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ABSTRACT

The development of information technology is currently running very fast and plays an important role in various ways. Computers are an important part of improving information technology. The computer's ability to remember and store can be utilized without having to rely on barriers like those of humans, such as hunger, thirst or emotional states. By storing information and an adequate set of reasoning rules, it allows the computer to provide conclusions or make decisions that are of the same quality as the ability of an expert in a particular scientific field. One branch of computer science that can support this is an expert system. The making of this expert system application uses PHP as the programming language and MySQL as the database. This expert system application produces output in the form of the possibility of a child's illness based on the symptoms felt by the user. This system also displays the magnitude of the value of trust in these symptoms to the possibility of the patient's childhood illness. The magnitude of the trust value is the result of calculations using the Bayes Theorem method.

1. Introduction

One of the substances most needed by the human body. Various vitamins can not be produced by the human body[1],[2]because it's necessary As a result of a lack of vitamins can be a big problem, especially because vitamins are intake from food and fruits to get these vitamins[3],[4],[5]. But not everyone is motivated to carry out early inspection and tracking. They feel they don't need it because the symptoms of the disease due to lack of vitamins are not very visible and financial reasons are becoming an obstacle[6],[7].

Along with the very rapid development of technology in the field of medicine, nowadays technology has also been used to help improve better service to the wider community.[8],[9]. The very busy work of a doctor has resulted in the expert system field being utilized to assist an expert in diagnosing various diseases, such as heart, kidney, teeth, skin, lungs to vitamin needs.[10],[11], .

An expert system is a part of artificial intelligence which contains knowledge and experience input by one or many experts into a particular area of knowledge so that everyone can use it to solve various specific problems, in this case the problem of diagnosing diseases due to deficiency. vitamins in children under 5 years of age[12],[13].

The data stored in the database will accurately inform a complaint and can conclude the type of disease caused by a lack of vitamins in toddlers. So that every toddler with a disease caused by a lack of vitamins can easily and quickly find out the type of disease.

2. method

In completing this thesis the author uses 2 (two) study methods, namely:

2.1 Field Study

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

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a. Observation (Observation), is one method of data collection that is quite effective for studying a system. Its activities are by direct observation of ongoing activities, namely observing patient consultation activities in the RSU. Tanjung Pura.
b. Interview, namely collecting data by conducting questions and answers with pediatricians regarding their understanding of diseases caused by vitamin deficiencies, prevention and treatment that should be done. The questions that the author will ask are.

2.2 Library Studies (Library Research)

the author conducts a literature study from books, articles and scientific papers as well as internet media to obtain data related to thesis writing such as theories about information systems, such as expert system design, types of diseases caused by vitamin deficiencies, Bayes Theorem Method and theoretical descriptions of the PHP programming language and MySQL.

2.3 System Testing / Testing

Done to whether the programming work has been done correctly so that it can produce the desired functions. Testing is also intended to find out the limitations and weaknesses of the application program that is made to make improvements as much as possible.

In this case the author does some good testing on software, hardware and the new system. Software testing aims to make the application compatible with the hardware to be used. The hardware used must have specifications that are in accordance with the software version used so that it does not take a long time to run the application. The new system is being tested by running the application that was built and adjusted for research purposes based on the limitations of the problems previously described.

2.4 Research sites

The research location for writing this thesis was carried out at RSU. Tanjung Pura, whose address is Jl. Khairil Anwar No. 11 Tanjung Pura, Langkat Regency.

3. Results and Discussion

3.1 Program Results Display

This chapter will explain the display of the results of the application that has been made, which is used to clarify the views that exist in the expert system application. So that the results of its implementation can be seen in accordance with the results of the program that has been made. The following describes the display of results from an expert system for diagnosing diseases in children using the Bayes Theorem method, namely:

a. Home Page Display

This view is the homepage view that can be seen by the user, to see the profile and type of disease he wants to see. Image of the home page display as shown in Figure IV.1.

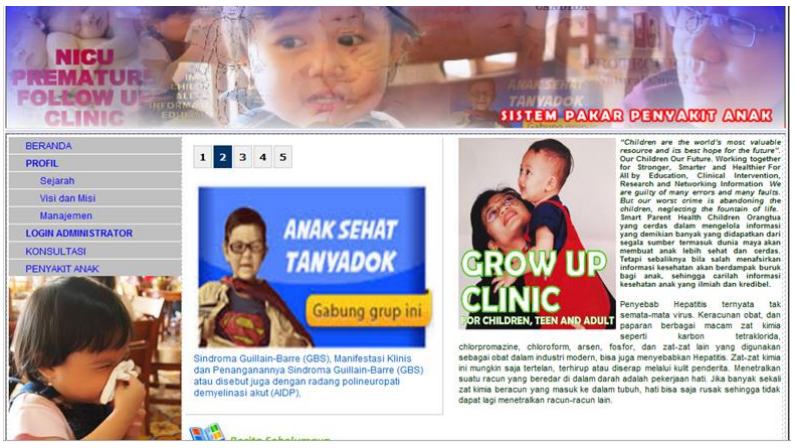

Figure 1. Home Page Display

b. View Expert Page 1

The expert page display step 1 is a page for selecting the type of childhood disease, which can be seen in the Figure 1 Expert Page Display in Figure IV.2.

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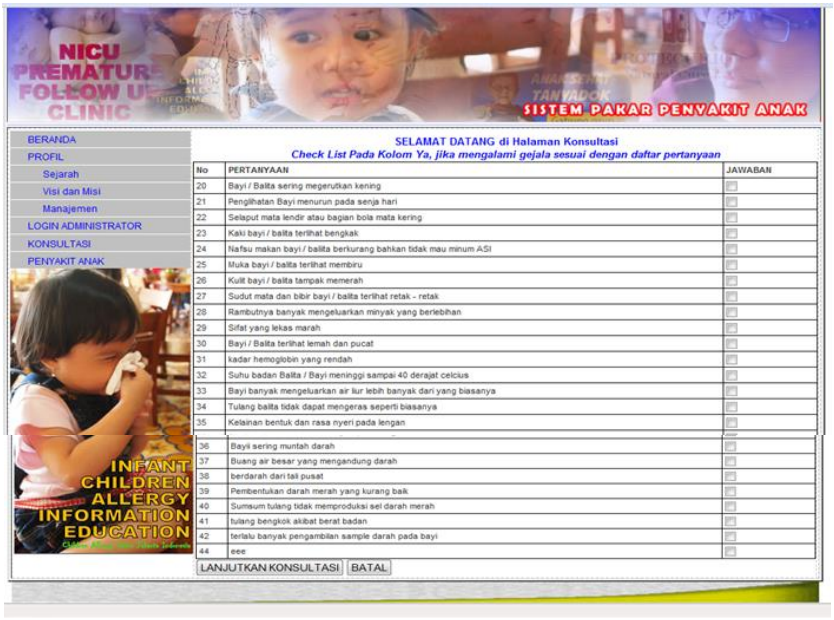

Figure 2. View Expert Page Step 1

c. Administrator Login Page Display

The administrator login page is a page for entering the administrator's user name and password. The login page display can be seen in the image below.

Figure 3. Administrator Login Page Display

d. Administrator Main Page Display

Fig.4. Administrator Main Page Display

e. Child Disease Input Page Display

This form is used to process child disease data. The data display can be seen as shown below:

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Figure 5. Child Disease Input Page Display

After the data is saved, a child disease data browsing display will appear. The browse display for pediatric disease data can be seen in the image below:

Figure 7. From Browse Children's Diseases

f. Symptom Input Page Display

This form is used to process child disease data. The data display can be seen in the image below:

Figure 8.. Data input problems / types of disease

After the data is saved, it will appear in the data browser for child disease problems. The browse data type of disease display can be seen in the image below.

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DATA GEJALA PENYAKIT

	KODE	GEJALA	BOBOT
	19	• Sering Mengerutkan kening	0.6
	20	• Penglihatan menurun pada senja hari	0.5
	21	• Selaput lendir atau bola mata bagian putih bola mata kering	0.7
	22	• Kaki terlihat bengkak	0.7
	23	• Nafsu makan berkurang	0.6
	24	• Mukanya terlihat membiru	0.8
	25	• Kulit tampak memerah	0.4
	26	• Keretakan kulit di sudut mata dan bibir	0.8

Done

Figure 9. Disease Problem Data Form

3.2 Discussion

In developing this expert system for diagnosing diseases in children, the author uses localhost and uses php myadmint as the database. The commands in the program that the author made are also quite easy to understand because the user only needs to click on the available buttons according to their needs.

3.3 Testing the Disease Consultation Form

Rule testing is a patient consultation process for a disease testing data system, which can be seen in table IV.4 below:

Table 1. Pediatric Disease Records Manipulation Testing Data

Codesymptoms	Answer
27	Yes
28	Yes
29	Yes

The consultation process is carried out by selecting the symptoms proposed by the system. Based on the patient's choice of symptoms, the system diagnoses the disease and provides solutions to the disease. The test results can be seen in Figure IV.13 below:

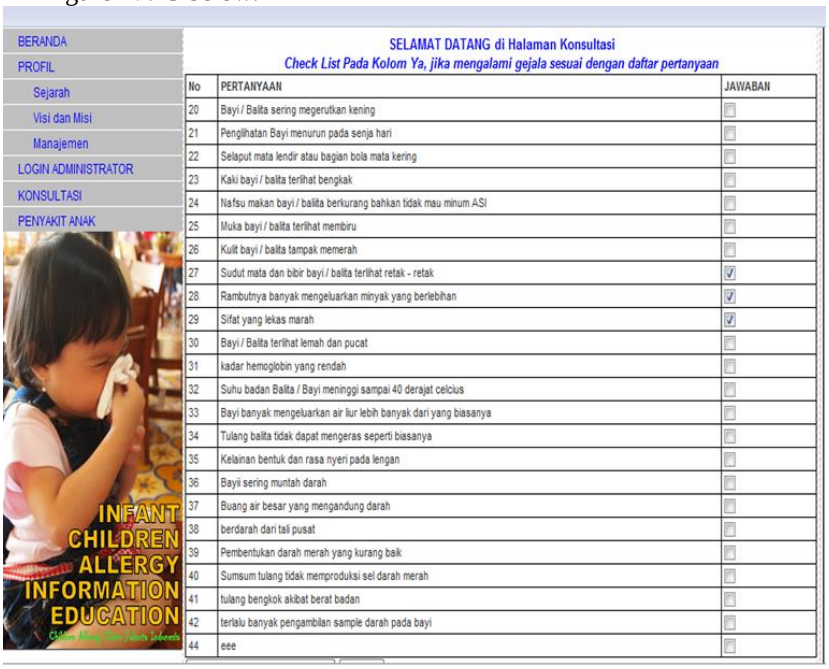

Figure 10. Testing the Disease Consultation Form

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4. Conclusion

With the application of an expert system for diagnosing diseases in children using the Bayes' theoema method, the authors can draw several conclusions, namely: year. In the application of an expert system to diagnose diseases in children with the Bayes theorem method, it can also serve as a guide for parents to carry out early treatment of diseases for them. This application has user friendly displays so that users can use this application easily. The development of this application was built and designed in such a way using the PHP programming language and the database uses MySql. This application is made with an attractive appearance, so that users of this application do not feel bored with the appearance of the programs. By using the Bayes Theorem method in determining disease in children, the results obtained are the same between the results of the system and the results of manual calculations.

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