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Expert System to Identify Typhus Using the Fuzzy Tsukamoto Method

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ABSTRACT

At RS. Hajj is clearly seen when the patient consults about typhus, the patient first mentions the complaints he is feeling, and after that the patient has to do another blood test to the laboratory and the results will come out 1 day after the patient's blood test is done, this is felt to be ineffective and requires long enough to find out whether the patient has typhus or not, the authors provide a solution to help ease the work of staff and doctors at the hospital. Hajj by creating an expert system to identify typhus using the Tsukamoto fuzzy method, before the authors make the system, of course the authors have to do research - what are the symptoms that often appear in patients with typhus at the hospital. Hajj, and the author gets 6 symptoms, namely body temperature, heart rate, headache, stomach ache, muscle aches, and tongue color. After that the writer made a system using the Tsukamoto fuzzy method. The Tsukamoto fuzzy method is first entered into a variable, the variable here is how many symptoms will be discussed, namely there are 6 symptoms, after that it is entered into the fuzzy set in the form of names and numbers, after that it is entered again into the knowledge base (rule-based). The expert only inputs patient data, patient consultation data is only enough to tell the expert what the complaints are and the expert will enter it into the system and enter the fuzzy set in the form of the name and number earlier, and the expert only needs to click the process button, the results of the patient having the disease will appear. low-risk typhoid, moderate, or high. And if the expert clicks the save button, the patient data for the consultation will automatically be stored in the identification and the expert can make a patient identification data report directly from the system that the author made without having to be afraid of errors, for example the date of the consultation, the patient's name because the author has made this system as much as possible. This system is built using the Java programming language and MySQL database.

1. Introduction

Currently, technological advances are felt in our daily lives, the technology created is becoming more optimal in line with global needs and competition[1]. With intense competition in the global world, we are encouraged to do a job correctly, quickly and thoroughly to achieve optimal results without compromising quality. Therefore computers enter into human life as a tool to facilitate work[2],[3].

Computer-based systems with "Artificial Intelligence" are indispensable in human life, which has the aim of adopting abilities similar to humans in reasoning or thinking.[4],[5]. The use of information systems with artificial intelligence, machines or systems designed and programmed to be able to replace the vital role of humans in finding solutions, making decisions, classifying, predicting, and other things that are identical to human intelligence. Thus it can provide convenience in completing work or problems, because in several aspects the human role can be replaced by a computer[6]. The goal is that the quality of human life can be further improved because jobs that are inefficient, time-consuming, tiring, or dangerous can be diverted to be done by machines.

Typhus is an acute infectious disease that usually affects the gastrointestinal tract. Diagnosis of typhus can be done by looking at clinical symptoms in the form of fever, weakness, abdominal pain, difficulty defecating and with laboratory tests.[7]. Laboratory tests that are carried out are specific blood tests (such as culture or collection/separation of germs, widal test). Typhus attacks around 22 million people per year with yesterday's figure of 200,000 people per year. According to WHO, in 2003 there were around 900,000 cases in Indonesia, of which around 20,000 sufferers died.

Many cases of typhoid patients who relapse are caused by several factors, especially the ineffective treatment system. People are starting to choose traditional medicine to boost the immune system which can

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prevent various diseases, one of which is typhus[8],[9]. There are many herbal plants that function to treat typhoid in the community, including bay leaves, noni fruit, upas angels and others.[10].

The author conducted research at the Hajj Hospital, which is located at Jl. Rumah Sakit Haji Medan Estate. Engaged in the field of health in treating patients who are sick. The author will discuss more about typhus, in dealing with this disease at the Hajj Hospital, patients are diagnosed by using experts to treat it, namely typhoid specialists.

2. Method

In the research the authors carried out several ways / procedures in examining the existing system at the research site: The research methodology in this study was:

a. Observation Method (Observation)
   In this observation method, the author is given the opportunity to make direct observations on the head of the Hajj Hospital laboratory, which takes care of all activities related to all kinds of diseases, one of which is typhus.
b. Interview Method
   In collecting this data the author conducted interviews and asked questions directed at the problem of typhus. Interviews were conducted with the Head of the Laboratory at RS.Haji Medan.
c. Library Studies
   The research was conducted by collecting library materials in campus libraries such as the Potential Main library, the University of North Sumatra (USU) library, as well as public libraries such as the regional library of North Sumatra.

2.1 How is the old system with the system to be designed

a. Running system
   Identifying typhus at the Hajj Hospital is still done manually. The blood of people with typhus will be checked in the laboratory using the widal test (using a glass plate) which is done manually, after which the laboratory results will come out no later than 1 day. This process is felt to be less accurate.
b. system to be designed
   In the system to be designed, an expert system for identifying typhus using the fuzzy tsumokoto method will help the Hajj Hospital in dealing with identifying typhus. An IF AND THEN system is created to identify it using a computer. This means that if there are symptoms, it will be concluded that the patient has typhus or not, who has conducted direct research by an internal medicine specialist and a laboratory at Haji Hospital in Medan.

2.2 Testing / Trial System to be tested

At this stage, black box system testing is carried out, which includes functional testing and system robustness. From the results of testing this system, it can be seen that the suitability of the design results with the expected needs analysis.

2.3 Research sites

This research was conducted at the Hajj Hospital which is located at Jl. Medan Estate Hajj Hospital Tel. (061) 6619520,(061) 6619521 Fax (061) 6619519. Website: www.rshajimedan.com, Email: rshajimedan@gmail.com , Info@rshajimedan.com.

3. Results and Discussion

The following describes the display of the results of an expert system for identifying typhus using the Fuzzy Tsukomoto method

3.1 Program Results Display

a. View of Expert Login Form

The Expert login form functions to provide verification of access rights to the expert in question, so that the expert who accesses them has the authority they have. The result image of the Expert login form is as shown in the image below.

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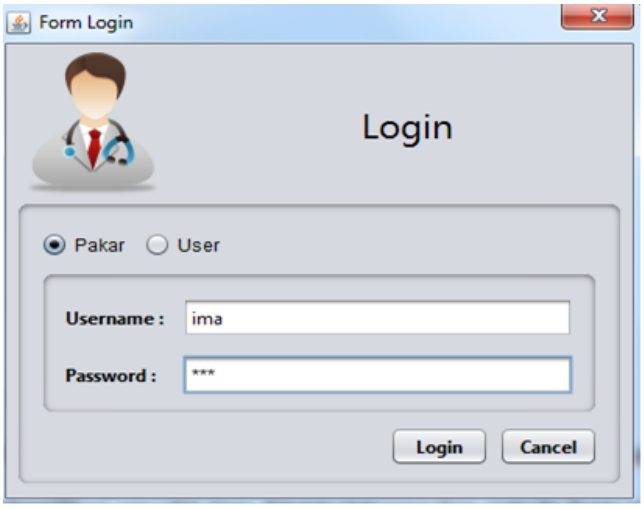

Figure 1. View of Expert Login Form

b. Display Login Form User

The user login form functions to provide verification of access rights to the user concerned, so that users who access them have the authority they have. The resulting image of the User login form is as shown below:

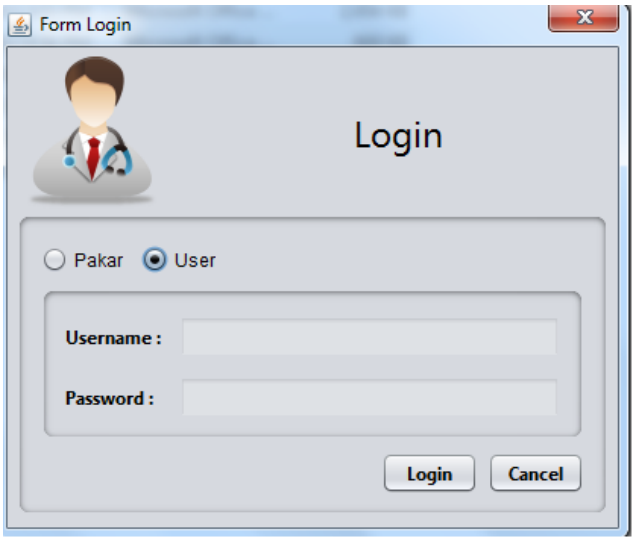

Figure 2. Display User Login Form

c. Main Page Display

This main page serves as the front page or homepage. The resulting image from the main page is as shown in the image below

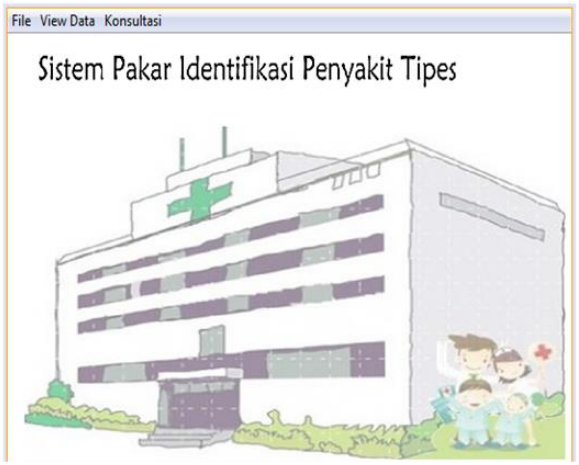

Figure 3. Main Page Form Display

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d. Patient form display

Patients must first fill in data such as: name, address, gender, and cellphone number. The image below is the display of the patient menu.

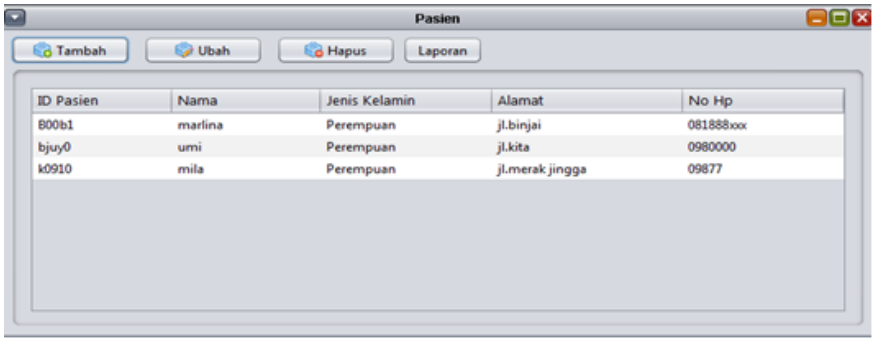

Fig.4. Patient form display

e. Display Form Changing Password

The change password form is a menu used by experts to change the expert's password if something happens, as shown below:

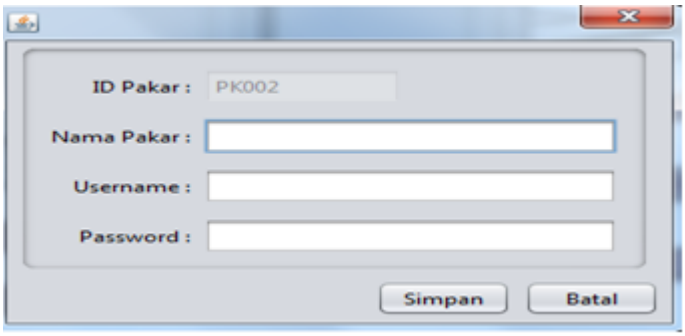

Figure 6. Display Form Changing Password

f. Display Variable Form

The variable form is a menu used by experts to see what symptoms appear, as shown in the image below:

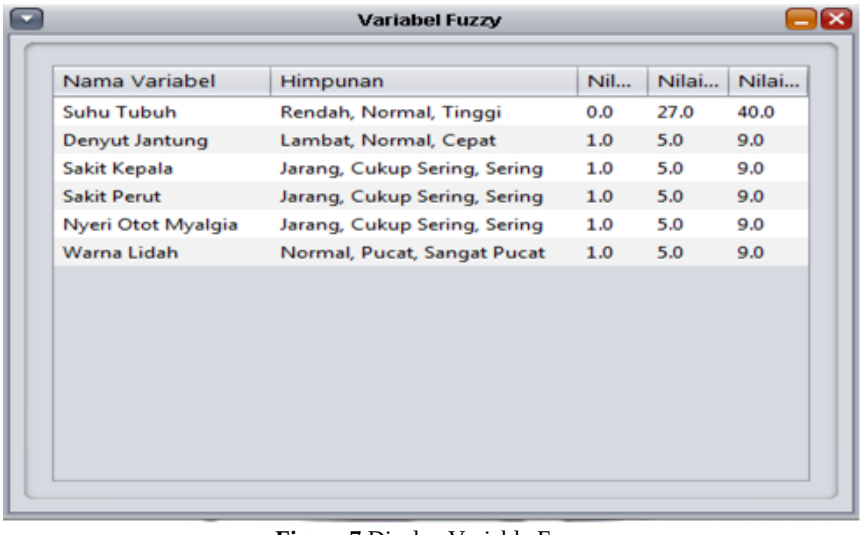

Figure 7. Display Variable Form

g. Display Form Rules

The Rule Form is a menu used by experts to manage Rule Based rule data, as shown in the image below:

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Figure 8. Display Form Rules

h. Disease Form Display

The Disease menu is a menu that contains what typhoid is, as well as the precautions that must be taken by patients with typhus, as shown in the image below:

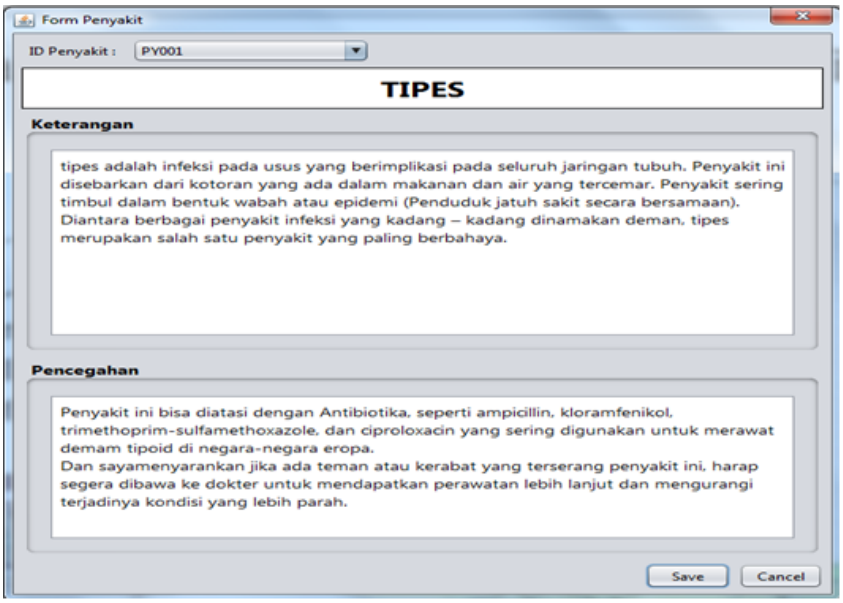

Figure 8. Display Disease Rule Form

i. Display the Identification Form

The consultation form is a menu where the patient fills in the symptoms on the identification form, then the results of the patient suffering from low, moderate, or high typhus can be seen when pressed on the process bottom. As shown in the image below:

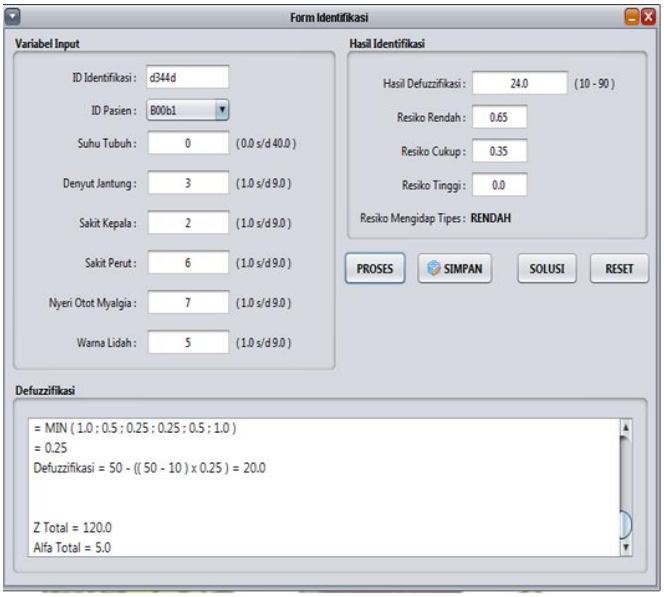

Figure .9. Disease Form Display

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4. Conclusions

By making the application of the Fuzzy Inference System in Identifying Typhoid with this Fuzzy Tsukamoto. Based on the discussion in the previous chapters, the following conclusions can be drawn in general: Fuzzy Logic can be useful because it is an effective and accurate way to describe human perception of problem solving. nine decisionsFuzzy is a representation of a constructed knowledge with if - then rules.Sometimes a fuzzy system can run without having to go through composition or fuzzy decomposition.In the Tsukamoto method, each consequence of a rule in the form of an If- Then must be represented by a fuzzy set with a function monotonous membership.

5. References

[1] N. S. Wardana, P. H. Saksono, and H. Yudiastuti, "SISTEM PAKAR UNTUK MENDIAGNOSA PENYAKIT DEMAM BERDARAH DENGUE (DBD) DENGAN PROLOG".

[2] A. Bairizki, *Manajemen Sumber Daya Manusia (Tinjauan Strategis Berbasis Kompetensi)-Jilid 1*, vol. 1. Pustaka Aksara, 2020.

[3] M. Dinar and M. Hasan, "Pengantar Ekonomi: Teori dan Aplikasi," *Makassar CV. Nur Lina Bekerjasama dengan Pustaka Taman Ilmu*, 2018.

[4] A. Karim *et al.*, *Pengantar teknologi informasi*. Yayasan Labuhanbatu Berbagi Gemilang, 2020.

[5] J. D. Susatyono, "KECERDASAN BUATAN, Kajian Konsep dan Penerapan," *Penerbit Yayasan Prima Agus Tek.*, pp. 1–151, 2021.

[6] T. P. Ardiyansyah, S. S. Adi, and D. N. Dewi, "Persepsi Guru Praktikan Terhadap Pembelajaran Online Pada Program Praktek Mengajar Daring di Tengah Pandemi Covid-19," in *Prosiding Seminar Nasional Teknologi Pembelajaran Universitas Negeri Malang 2021: Pemberdayaan Teknologi Pembelajaran dalam Tatanan Multidisipliner di Era 4.0*, 2021, vol. 1, p. 291.

[7] I. Widura, "GAMBARAN ASUHAN KEPERAWATAN ANAK DEMAM TIFOID DENGAN DIARE DI RUANG ANGGREK BRSU TABANAN TAHUN 2020." Poltekkes Denpasar Jurusan Keperawatan, 2020.

[8] M. D. Amiruddin, *Penyakit kusta: sebuah pendekatan klinis*. Firstbox Media, 2019.

[9] Y. Ardhiyanti, N. Lusiana, and K. Megasari, *Bahan ajar AIDS pada asuhan kebidanan*. Deepublish, 2015.

[10] F. F. Nisyapuri, J. Iskandar, and R. Partasasmita, "Studi Etnobotani Tumbuhan Obat di Desa Wonoharjo, Kabupaten Pangandaran, Jawa Barat," in *Jurnal Prosiding Seminar Nasional Masyarakat Biodiversitas Indonesia*, 2018, vol. 4, no. 2, pp. 122–132.