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Saturday, August 15, 2009

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Sunan Kalijaga Yogyakarta

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Foreword

Assalamu'alaikum Wr. Wb.

On behalf of the Organizing Committee of the 1st International Industrial Informatics Seminar 09 (IIS09), it is a great pleasure for me to welcome you to visit our uniquely designed campus State Islamic University Yogyakarta for attending this seminar. Around 130 selected papers will be presented throughout the seminar. I am sure you will find this seminar as an excellent forum for fruitful discussion that will provide us with interesting program and enjoyable activities.

The IIS09 will include one plenary session and a number of theme-based tracks. The seminar will be divided into 2 sessions. We wish you can find the one that most suit to your interest. We also hope that participants from overseas and Indonesia can have a good atmosphere for information sharing to foster a better research network among others.

The seminar would have not been possible without the contributions and hard works from all of you, especially our keynote and invited speakers, the authors, reviewers, chair persons, advisory committee, as well as our Technical Program and Organizing Committee. May I take this opportunity to express my sincere appreciation to all of them.

I do hope that all of you would find this seminar interesting, stimulating, beneficial and enjoyable. Although it will only be a one day seminar, I wish you could spend some times to explore and enjoy our historical city of Yogyakarta, the education and tourism destination city in Indonesia.

Wassalamu'alaikum Wr. Wb.

Yogyakarta, August 15, 2009

Prof.Dr.H.M. Amin Abdullah
Rector of Sunan Kalijaga State Islamic University

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EXPERT SYSTEM TO DIAGNOSE SKIN DISEASE

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Abstract – *Diseases/aberration skin type varies, a skin disease due to infection of fungi, bacteria, virus or allergy, violence, and others. However, some skin diseases are often very similar appearance to one another. Some skin disease was known The Great Imitator because the deviation causes by skin-like disease causes the other. Therefore,it is recommended that everyone keep up, both with the modern treatment and traditional treatment and is often called the alternative treatment. It is necessary for a particular source is capable of providing information about the drug. This information includes indications, side effects, and how the drug itself. By using the expert system can provide the capabilities and ease of space for consultation and can provide recommendations to quickly and precisely in a selection of modern medicine that have property/indication and how to use. And can provide information to the user about the contents of active substances in drugs that consist of indications, side effects, and rule*

Keywords: Expert System, Skin Diseases.

1. Introduction

"In a healthy body there is a strong soul", that's the impression people about this for health. Indeed correct and, if health is the most valuable. Diseases/aberration skin type varies, a skin disease due to infection of fungi, bacteria, virus or allergy, violence, and others. However, some skin diseases are often very similar appearance to one another. Some skin disease are called The Great Imitator because the deviation by skin-like disease causes the other. Therefore, for the skin disease is clearly someone who experienced, the doctor needs to see abberation directly with carefully, even sometimes required supplementary examination, if already known types of skin disease experienced, it will be determined the appropriate treatment, whether the medicine is applied in the skin (Topical), medicinal drink (oral) or need to do a certain action. Therefore, it is recommended that everyone keep up, both with the modern treatment and traditional treatment and is often called the alternative treatment. However, according to the development of modern treatment is a treatment option that is selected by the main society than the traditional treatment, given the modern treatment by doctors and experts who professionally. Given that modern medicine is very easy to obtain by the general public then the medicine can be obtained at pharmacies, pharmacy without prescription. It is necessary for a particular source is capable of providing information about the drug. This information includes indications, side effects, and how the drug itself. By using the expert system can provide the capabilities and ease of space for consultation and can provide recommendations to quickly and precisely in the selection of a drug and how to use them. With reason as above decomposition Expert System disease diagnosis and treatment made the skin. This application help users determine the right drug in the skin disease.

Making Expert System to diagnose and treatment of this skin have a goal for the system that is made has the ability:

a. Build an expert system that provides space to the consultation and recommendations on the indications of this drug, side effects / contra indications drug use and drug policy.
b. Provide information about the symptoms of the disease to determine the disease so that more information consultation and recommendations to determine the drug and its indications, contra indications and the drug itself.

2. Background

2.1 Expert System

Expert system is a system that seeks to adopt human knowledge to computer, so that the computer can solve the problem as usual is done by experts (Kusumadewi, 2003). Expert system is designed so that both can complete a particular problem with imitating the work of the experts. With this expert system, people can complete a fairly complex problem that can only be true by the help of experts. For experts, this expert system will also help activities as a very experienced assistant. There are several definitions of system specialists, among others: (Kusumadewi, 2003).

a. According to Durkin : expert system is a computer program designed to show ability of problem solving done by a specialist.
b. According Ignizio : expert system is a model and associated procedures, in a particular domain, the level of expertise which can be compared with a specialist.
c. According to Giarratano and Riley : expert system is a computer system that can overlap or mimic the ability of a specialist.

Experts system consists of two main parts, namely: development environment (development environment) and environmental consultation (consultation environment). Development environment is a work area used by the expert system developer to develop the

knowledge base of expert system, while the system operates in a specialist environmental consultancy. Components of the expert system are: Subsystem additional knowledge, Knowledge base, Inference engine, Blackboard, Interface, Subsystem description, and Filter system knowledge.

2.2 Skin Disease

Skin is an organ that is located outside the most membatasinya from the environment and human life (Faculty of medicine University of Indonesia, 1993). Wide leather adults with 1.5m2 weight approximately 15% body weight. Skin is the person and the essential and vital health care and is a mirror of life. Skin is also very complex, sensitive and elastic, the situation varied climate, age, sex, race, and also depend on the location of the body. Color vary from light skin color (fair skin), blonde and black, pink on the feet and hands of babies, and black and brown on the genitalia of adults. Likewise on the skin vary on soft, thin and thickness: elastic skin and are on the loose palpebra, lips and preputium, a thick skin and there is suspense in the feet and hands of adults. That there is a thin skin on the face, soft on the neck and body of the blond head in the rough there. Skin disease is a disease found in the skin, skin disease can result from infection of fungi, bacteria, virus or allergy, violence, and others. skin itself structured into three main layers. a skin disease expert system discussed in this disease is 20, namely:

1. diaper rash illness; 2. intertrigo skin disease; 3. cuplak/ growth diseases; 4. tinea/ringworm disease; 5. pedikulosis disease; 6. folikulitis disease; 7. ulcer/furunkel disease; 8. Harpes Zoster/dompo disease; 9. Dermatitis Atopik disease; 10. Contact Dermatitis allergic disease; 11. vulgaris/pustule disease; 12. Dermatitis Numulanis disease; 13. Psoriasis disease; 14. Dermatitis contact iritan disease; 15. varisela/chickenpox diseases; 16. skables/scabies disease; 17. urtikaria/biduran disease; 18. miliaria / prickly heat disease; 19. melasma/ kloasma/flek disease; 20. pitiriasis versikolor (panu) disease.

The types of drugs consists of two types are as follows (Ioni, 2000):

1. Natural medicine (Traditional)

Many plants around us that can be used as medicine. The use of plants as medicine has been done in a down-down from our forefathers. Even now any drugs derived from plants increasingly popular and much sought for traditional medicine easily obtained and have side effects that are not too dangerous.

2. Modern medicine (preparation)

Not all diseases can be cured with medicine plants, because the medicine may be sought to be very difficult. Modern medicine at the drug store and pharmacy in. Modern medicine is not practical because we need to explore what the plants used as medicine, does not need to make it, better lasting that can be used later for the original drug is still good.

3. Analysis and Design System

3.1 Analysis System

Expert system that will be built this is an information system with computer-based technology utilizing artificial intelligence that functions as a system tool or our suggestions/recommendations from the process of diagnose and treatment of skin, so that the layman or the user can know the diseases that suffered. So that preventive action can be done since early (after the previous data include symptoms that are required through the facility interface (interface) that the consultation has been prepared earlier). Information generated expert system diagnosis and treatment of this skin is expected to meet specifications that are able to present the name of the disease and recommendations about drugs that contain indications about, contra indications according to the type of the disease and how the drug. This expert system for specialists who have a basic knowledge of medicine and skin disease to be able to process the data contain indications about, contra indications and how the drugs and know the symptoms and skin disease can also be directed people to add insight/knowledge about the disease leather and medicines.

3.2 Design System

Stages in the design of system architecture design is expert system design below that includes the DFD (Data Flow Diagram), database design, knowledge acquisition, and knowledge base design.

3.2 Process Design

1. Data Flow Diagram (DFD) Level 0

Data Flow Diagram level 0 as shown in the image below:

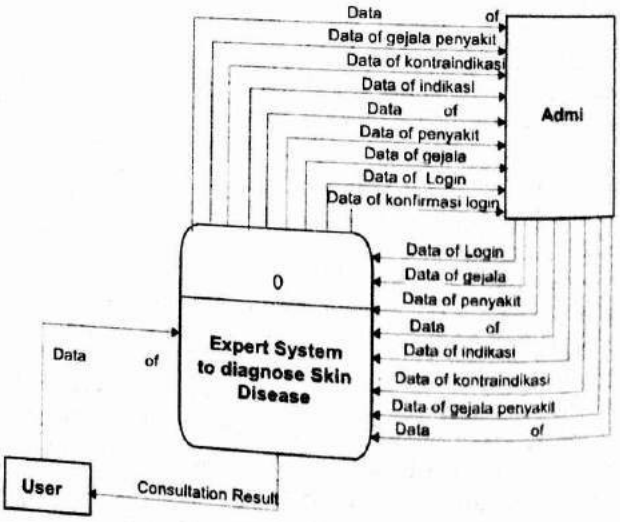

Figure 1 DFD level 0

2. Data Flow Diagram (DFD) Level 1

In the data flow diagram level 1 there are 3 processes, namely the process of login process, the manner of data, and the consultation process for the disease determine drug recommendations based on the disease. DFD level 1 can be seen in the image on Figure 2.

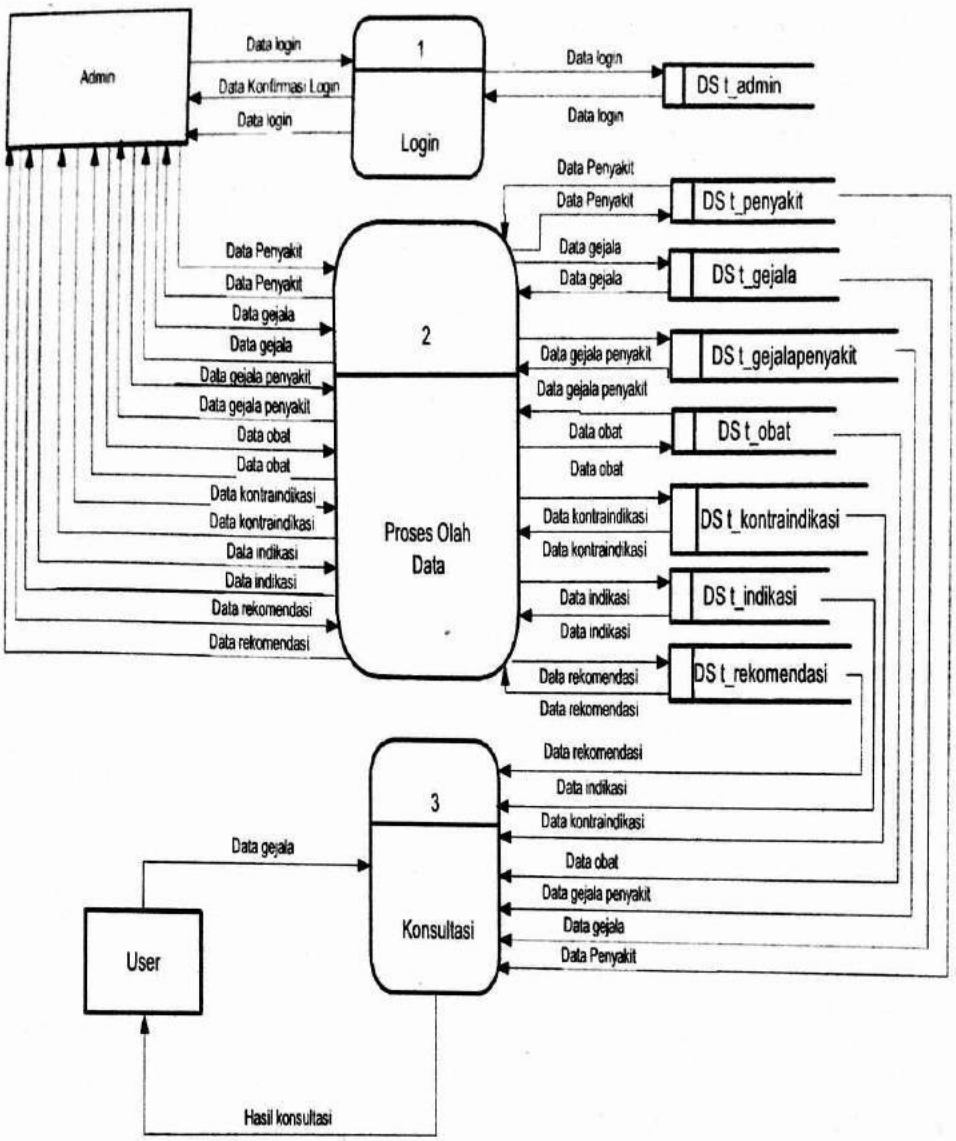

Figure 2 DFD Level 1

3. Database Design

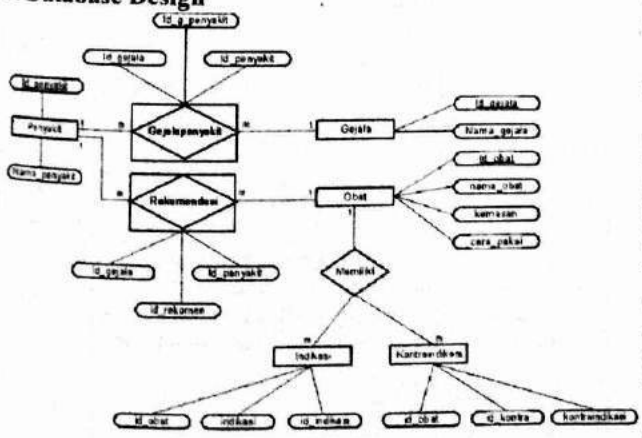

Figure 3 E-R Diagram

4. Knowledge Acquisition

In the design of knowledge acquisition is an important part in creating the expert system for knowledge acquisition is the process of grouping data that aims to clearly see the data that will be built for an expert diagnose system skin disease.

5. Knowlegde Base Design

Expert knowledge base system is already saving knowledge is coded. In a knowledge base aimed at matching as the mechanism inferensi or searching data. Knowledge base contains rules that will be used for drawing conclusions that result from the process of data. Type of knowledge representation is selected to confirm the facts of the knowledge representation is the type of production rules. Representation is structured on the principle of rule-following pattern:

IF condition THEN action

Conditions are conditions in the form of symptoms and the disease.

Under this rule will be 20 this production system:

Rule	Name of diasease	Condition	Action
1	pitiriasis versikolor (panu)	**IF** (intention deviation form) the speck-lesi white/black chocolate **AND** scaly when rubbed itchy **AND** lightweight **AND** especially on the axilla, thigh-fold, arm, leg up, neck, face, scalp that blond, at the back, the top of the chest. **AND** rounded shape, oval or as a boundary map clearly	**THEN** pitiriasis versikolor (panu) disease diagnosis
2	diaper rash illness	**IF** there is a lot on the baby, especially in the buttocks **AND** the reddish color on the surface of the skin **AND** strictly in accordance with the boundary inherent diaper on the skin every exposed water **AND** usually fussy baby	**THEN** diaper rash disease diagnosis
3	the intertrigo Skin fold disease	**IF** feels painful itchy skin fold **AND** there is the speck skin **AND** (meaning skin aberration) lesi moist **AND** (meaning skin aberration) lesi there are two passengers on a patch of skin	**THEN** intertrigo disease diagnosis
4	the cuplak / growth / veruka vulgaris skin disease	**IF** there is a small protrusion **AND** hard-surface flakes **AND** the color such as skin **AND** if pressed perpendicular, skin feels pain **AND** usually grow in the open area	**THEN** cuplak/growth/veruka vulgaris disease diagnosis
5	the tinea/ringworm disease	**IF** There is reddish color on the surface of the skin **AND** itching **AND** most often when sweating in leg **AND** rounded shape, oval or as a boundary map clearly **AND** the middle section seems healed **AND** there is squama especially at the lesi (meaning skin aberration)	**THEN** tinea/ringworm disease diagnosis
6	the disease pedikulosis	**IF** the hair found nodule-nodule **AND** itch **AND** especially the hair, especially on the back of the head and side **AND** can be extended overlooks the head of **AND** as the sand found in the trousers in black lice **AND** hair found in the panties	**THEN** pedikulosis disease diagnosis
7	the folikulitis disease	**IF** Skin feels painful **AND** itching **AND** there is especially in the area of hair **AND** there is pus on the base of the hair base **AND** surrounded by The speck red hair	**THEN** folikulitis disease diagnosis
8	furunkel disease (ulcer)	**IF** there is a red lump **AND** feel pain **AND** there are bump especially in open areas (thigh, stomach, head, face) bump red **AND** after cooking have eyes **AND** dizziness **AND** hot **AND** base in the areas affected **AND** when broken out blood and pus followed reduced pain	**THEN** furenkel disease diagnosis (ulcer)
9	harpes zoster / dompo disease	**IF** feel pain **AND** skin followed red spots in the body **AND** gather a red dot appears on one side of **AND** spots containing liquids **AND** fever **AND** dizziness	**THEN** harpes / zoster / dompo disease diagnosis
10	the dermatitis atopik disease	**IF** itchy especially knee **AND** folded, folding elbow, neck **AND** a thick red speckle **AND** dry skin history **AND** have themselves / families who suffered similar pain	**THEN** dermatitis atopik disease diagnosis
11	allergic contact dermatitis disease	**IF** itchy **AND** there is redness on the skin when the skin feels dry continues and thick **AND** (intention deviation form) lesi appear on the back shelf (such as metals, cosmetics, ring, necklace) **AND** swelling	**THEN** the disease diagnosed allergic contact dermatitis
12	vulgaris/pustule disease	**IF** have pimple skin **AND** followed skin spots red in the body **AND** there are komedo diwajah, chest **AND** back the top **AND** sometimes itchy	**THEN** vulgaris / pustule disease diagnosis
13	the dermatitis numularis disease	IF itchy AND sometimes fleshy AND skin redness of the skin have a coin AND is located on the down neck, arms down	**THEN** dermatitis numularis disease diagnosis
14	the Psoriasis disease	IF usually there is skin on the head, elbow, knee, buttocks **AND** a thick reddish-the speck with thick shell above skin redness **AND** a boundary and equally emphatic	**THEN** Psoriasis disease diagnosis
15	contact dermatitis iritar. disease	**IF** the skin feels hot or painful punishment **AND** there is redness on the skin, with the scale above **AND** sometimes followed by a liquid spot firm skin **AND** a boundary when the situation feels dry skin and thick skin **AND** broken in pieces	**THEN** contact dermatitis disease diagnosis iritan
16	varisela/chickenpox diseases	**IF** fever **AND** feeling lethargic **AND** feel of the pain in the head **AND** appear red (early) and then changed to contain liquid bubble in the body **AND** there is usually spread to the edge and then spread to face movement members **AND** a bubble containing liquids change into liquid and then dry up pus	**THEN** varisela/chickenpox disease diagnosis
17	skables/scabies disease	**IF** itchy **AND** there is a bulge on the skin **AND** with a scratch wound lengthwise arise because scratching **AND** infectious (have family members, close to what a pain similar)	**THEN** scabies disease diagnosis
18	the biduran disease	**IF** itchy **AND** redness **AND** swelling the local firm boundary **AND** sometimes the middle looks more pale **AND** bump-bump of seed corn or coin **AND** sometimes accompanied by shortness of breath, hoarse and inflammation in the nose **AND** the body that is often faced **AND** quickly disappear and appear quickly	THEN biduran disease diagnosis

19	prickly heat illness	**IF** there is a nodule-red nodule that is very itchy, specially in the area of bending **AND** there is a skin vesicle fluid contains	THEN the prickly heat disease diagnosis
20	the flek skin brown disease	**IF** young or old aberration **AND** the skin forms a boundary edge is not strictly regular **AND** is located on the cheeks, forehead and nose	**THEN** flek disease diagnosis

Table 1. Table Rule

4. Implementation

Software applications system specialist diagnosis and treatment of disease skin interface has 3 pages, namely: the main menu page for the user and the consultation room, admin page, and page utility.

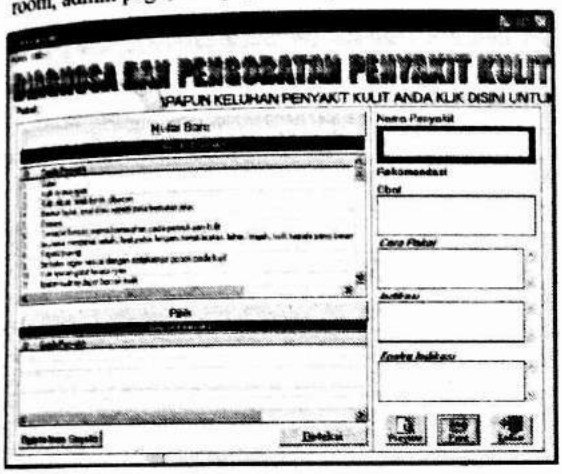

Figure 4 Main Menu display and consultation room

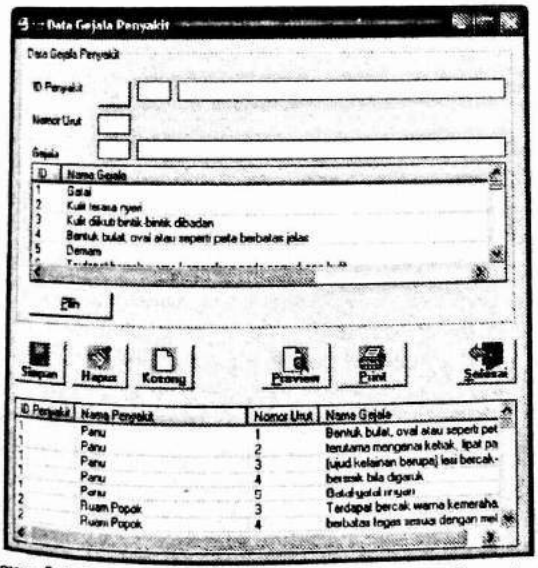

Figure 5 Display Processing data of Diseases Symptoms

5. Conclusions

Description of the overall conclusion that can be taken Diagnostic Expert System Medicine and Skin Diseases has been able to:

1. Provide consultation to the space or the user to know the diseases suffered by entering the symptoms.
2. Giving space to the admin or expert in the field of skin disease, so symptoms can process data, disease data, the data indicate, the data and data contradiction drugs and also provide how the drug.

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