Diagnosis Expert System

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Required Items

Elaf Alghamdi	Task 1: Project Report – description of the topic.
Raneem Alomari	Task 2: Coding applied to solving the proposed problem.
Rahaf Alghamdi	Task 3: Clear Presentation for the project.

Abstract

Diagnosis Experts Systems is one of the first and most ongoing Artificial Intelligence projects. The agent-based diagnosis expert system for patients (DExS) is developed in this study based on an examination of the issues faced by current public health circumstances, such as the sharp increase in elderly patients, limited medical professionals, resources, and technology. [1]

The installation of the technology will improve the quality of treatment provided to patients. The establishment of the system will make medical condition diagnosis quick and straightforward while also assuring that the diagnosis is correct and dependable. Patients who want to learn more about their health. [2]

Introduction

An expert system is computer software that mimics the decision-making abilities of a human expert. By doing so, it mimics the behavior of a human expert, using human knowledge to solve problems that would normally require human intelligence. Patients seek medical help for distinct reasons, including the diagnosis and treatment of various ailments. However, because many other diseases can cause fever, verifying the diagnosis of malaria can be difficult. It could be done to confirm a clinically suspected diagnosis or to gain more detailed information. Infection, for example, may signal the presence of malaria sickness in underdeveloped countries where malaria is widespread and is frequently associated with the "factor of development" known as poverty. Computer-based devices are rapidly being used to optimize the quality of medical services. [3]

Objectives of the study

What is a Diagnosis Expert System (DExS)?

Expert systems are databases designed to mimic (copy) the expertise and knowledge of a human expert on diverse topics. Human specialists' knowledge is entered and stored in the system. Users of the expert system can challenge knowledge. The system looks through its database for anything that matches the information given by the user. In the same way, as human specialists, the expert system can provide answers to tough situations. [4] Diagnosis Expert System (DEXS) can substantially aid in the identification of diseases and the description of treatment methods while considering the user's ability to cope with and engage with the expert system simply and plainly. [5]
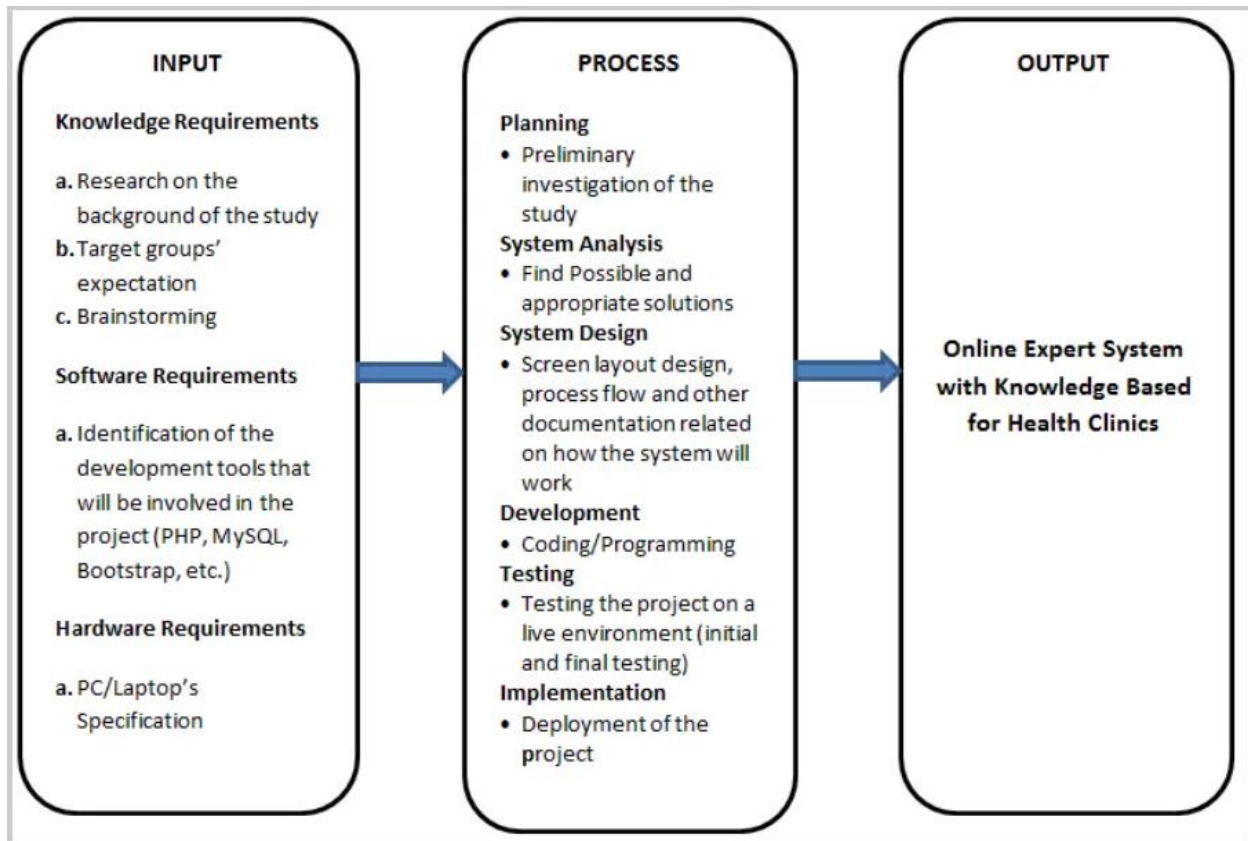
How can the Expert System program apply?

The DExS (Diagnosis Expert System) Technique can be applied in consultations since it immediately displays the diagnosis and clarifies the obtained results, which is extremely useful to the professional. The user can interact with a computer to solve an issue using an expert system. Because the expert system can store heuristic knowledge. The proposed system can perform a wide range of tasks. It will conclude the diagnosis based on the user's responses to questions posed by the system. The questions give the system an explanation of the patient's symptoms, which helps the expert system in diagnosing the illness using an inference engine. It stores the facts and the conclusion of the inference of the system, and the user, for each case, in the database. It performs database processing to extract rules, which completes the knowledge base. [6]

Diagnosis systems technology's range of applications to solve issues in industrial, commercial, and other industries is so broad that it defies easy categorization. These technologies have been divided into approximately seven types. These include Diagnosis and Troubleshooting of Devices and Systems of All Kinds; Planning and Scheduling; Configuration of Manufactured Objects from Subassemblies; Financial Decision Making; Knowledge Publishing; Process Monitoring and Control; and Design and Manufacturing. [7]

Suggestion solution

The researchers proposed the construction of the Knowledge-based Expert System for Medical Disease Diagnosis to satisfy the needs of the healthcare sector. The technology will aid in the diagnosis of a patient's health status via electronic means. It will use clinical reasoning to diagnose a patient's medical disease. The system will increase the quality of patient treatment. The system's development will make medical disease diagnosis quick and easy while also ensuring an accurate and reliable diagnosis. [8]

- Online Expert System with knowledge-based for health Clinics Conceptual framework

INPUT	PROCESS	OUTPUT
Knowledge Requirements a. Research on the background of the study b. Target groups' expectation c. Brainstorming **Software Requirements** a. Identification of the development tools that will be involved in the project (PHP, MySQL, Bootstrap, etc.) **Hardware Requirements** a. PC/Laptop's Specification	**Planning** • Preliminary investigation of the study **System Analysis** • Find Possible and appropriate solutions **System Design** • Screen layout design, process flow and other documentation related on how the system will work **Development** • Coding/Programming **Testing** • Testing the project on a live environment (initial and final testing) **Implementation** • Deployment of the project	**Online Expert System with Knowledge Based for Health Clinics**

Screenshots of solving problems

questions on how the diagnosis was reached, and what further investigative action could be taken to focus on a particular diagnostic candidate.

```prolog
1  im_sick:-
2   guessing(Disease),
3   write("after checking your symptoms i think u have: "),write(Disease),nl,
4   write(" thats it take care and remmber Prevention is better than cure "),undo.
5
6  guessing(cold):- cold,!.
7  guessing(flu):- flu,!.
8  guessing(covid):-covid,!.
9
10 cold :-
11     check(sore_throat),
12     check(runny_nose),
13     check(sneezing),
14     check(shortness_of_breath),
15     check(cough),
16     check(nasal_congestion),
17     check(respiratory_issuse),
18     check(lossing_appetite),
19 write("inclubation period is 1-3 days so dont woory just
20 take panadol , rest and drink hot drinks because "),nl.
21 flu :-
22     check(fever),
23     check(lossing_appetite),
```

im_sick.

dear patient do you have this Symptom: sore_throat?
y

dear patient do you have this Symptom: runny_nose?
y

dear patient do you have this Symptom: sneezing?
y

dear patient do you have this Symptom: shortness_of_breath?
y

dear patient do you have this Symptom: cough?
y

dear patient do you have this Symptom: nasal_congestion?

?- im_sick.

Examples▴ History▴ Solutions▴   ☑ table results Run!

```prolog
24     check(chills),
25     check(headache),
26     check(body_aches),
27     check(cough),
28     check(fatigue),
29 write("inclubation period is 1-4 days take antiviral drugs 2 time for 5 days,
30 for watry eays you take antihstamine helpful for your flu,
31 stay home and u may use cold compresses for the fever because "),nl.
32 covid :-
33     check(loos_of_taste/smell),
34     check(fever),
35     check(lossing_appetite),
36     check(chills),
37     check(headache),
38     check(shortness_of_breath),
39     check(cough),
40     check(respiratory_issuse),
41 write("inclubation period is 2-14 days
42 there is no cure discovered just eat well ,sleep well ,
43 drink plenty of fluids, open windos if u breathless  because "),nl.
44
45 ask(Q):-
46     write("dear patient do you have this Symptom: "),
47     write(Q),write('?'),read(Answer),nl,
```

dear patient do you have this Symptom: cough?
y

dear patient do you have this Symptom: nasal_congestion?
y

dear patient do you have this Symptom: respiratory_issuse?
y

dear patient do you have this Symptom: lossing_appetite?
y

inclubation period is 1-3 days so dont woory just take panadol , rest and drink hot drinks because
after checking your symptoms i think u have: cold
thats it take care and remmber Prevention is better than cure
true

?- im_sick.

Examples▴ History▴ Solutions▴   ☑ table results Run!

```prolog
33     check(loos_of_taste/smell),
34     check(fever),
35     check(lossing_appetite),
36     check(chills),
37     check(headache),
38     check(shortness_of_breath),
39     check(cough),
40     check(respiratory_issuse),
41 write("inclubation period is 2-14 days
42 there is no cure discovered just eat well ,sleep well ,
43 drink plenty of fluids, open windos if u breathless  because "),nl.
44
45 ask(Q):-
46     write("dear patient do you have this Symptom: "),
47     write(Q),write('?'),read(Answer),nl,
48     ((Answer==yes;Answer==y)->assert(yes(Q));
49     assert(no(Q)),fail).
50 :- dynamic yes/1,no/1.
51 check(Symptoms):-
52   (yes(Symptoms)->true;(no(Symptoms)-> fail;ask(Symptoms))).
53 undo :- retract(yes(_)),fail.
54 undo :- retract(no(_)),fail.
55 undo.
```

dear patient do you have this Symptom: cough?
y

dear patient do you have this Symptom: nasal_congestion?
y

dear patient do you have this Symptom: respiratory_issuse?
y

dear patient do you have this Symptom: lossing_appetite?
y

inclubation period is 1-3 days so dont woory just take panadol , rest and drink hot drinks because
after checking your symptoms i think u have: cold
thats it take care and remmber Prevention is better than cure
true

?- im_sick.

Examples▴ History▴ Solutions▴   ☑ table results Run!

Code script

```prolog
im_sick-:
 guessing(Disease),
 write("after checking your symptoms i think u have: "),write(Disease),nl,
 write(" that's it takes care and remember Prevention is better than cure "),undo.

guessing(cold):- cold.!,
guessing(flu):- flu.!,
guessing(covid):-covid.!,

cold-:
    check(sore_throat),
    check(runny_nose),
    check(sneezing),
    check(shortness_of_breath),
    check(cough),
    check(nasal_congestion),
    check(respiratory_issuse),
    check(lossing_appetite),
write("incubation period is 1-3 days so do not worry just
take panadol, rest, and drink hot drinks because "),nl.
flu-:
    check(fever),
    check(lossing_appetite),
    check(chills),
    check(headache),
    check(body_aches),
    check(cough),
    check(fatigue),
write("incubation period is 1-4 days take antiviral drugs two time for 5 days ,
for watry eays, you take antihistamines helpful for your flu,
stay home and u may use cold compresses for the fever because "),nl.
covid-:
    check(loos_of_taste/smell),
    check(fever),
    check(lossing_appetite),
    check(chills),
    check(headache),
    check(shortness_of_breath),
    check(cough),
    check(respiratory_issuse),
write("incubation period is 2-14 days
there is no cure discovered just eat well, sleep well,
drink plenty of fluids, open windows if u breathless because "),nl.

ask(Q)-:
    write("dear patient do you have this Symptom: "),
    write(Q),write('?'),read(Answer),nl,
))   Answer==yes;Answer==y)->assert(yes(Q;((
    assert(no(Q)),fail.(
 -:dynamic yes/1,no/1.
check(Symptoms)-:
)  yes(Symptoms)->true;(no(Symptoms)-> fail;ask(Symptoms)).(
undo :- retract(yes(_)),fail.
undo :- retract(no(_)),fail.
undo.
```

Query

Im_sick.

Output

Conclusion

Diagnosis systems are more popular among today's youth. The researchers used this information to create a knowledge-based Expert System for Medical Disease Diagnosis. The study's findings revealed that the system was well-received by the intended users and respondents. In terms of user acceptability, efficacy, quality, timeliness, and productivity, most target users and respondents are pleased with the system. Regrettably, most databases are proprietary and hard to obtain. Because some hospitals have already been employing computerized record systems instead of old paper-based systems, medical databases should have a bright future. Data generation for machine diagnosis should be simple. This method is generic, knowledge-based, and may be used to diagnose diseases with any rule-based expert system. We intend to expand

the capabilities of our expert system by implementing more inference rules for semantic-based knowledge representation in the future, as well as performing real user studies with patients and medical professionals. [9]

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